INTERNATIONAL JOURNAL OF SPECIAL EDUCATION

Volume 33,   3

Table of Contents

School Challenges of Students with Visual Disabilities

Zelalem Temesgen,

Bahir Dar University,

Ethiopia

(Zelalem950@gmail.com)

Abstract

The purpose of this study was to identify challenges that students with visual disabilities faced in the primary schools of Weldeya town in Ethiopia. Principals, students with visual disabilities and teachers were invited to take part in the study. With this, a phenomenological design was used to investigate the experience of participants regarding school challenges of students with visual impairment. The researcher used a semi-structured interview, focused group discussion and observation checklist to gather data. Then, the data were analyzed thematically which were preset in relation with research questions. Through the discussion, environmental inaccessibility, inflexibility of financial guidelines in schools and lack of training among teachers were identified as major school challenges for education of students with visual impairment.

Introduction

The history of the education of the blind in Ethiopia has been profoundly anchored into the past Christianity. For this, the Ethiopian Orthodox Church has played a matchless role to educate the blind for the purpose of church rituals (Zelalem, 2014). As Sergew and Tadesse (1970) noted, the church education derives its distinctive character from the unique Christian heritage of the country. With this, again, Ethiopia is the only African country to have preserved Christianity as its own religion for over thousands of years. The religious heritage, therefore, contributed for the country to have its own written language and literature which makes the country still unique in

Africa. For this, the widely scattered monastic tradition wich are dated back to the fifth century enlightened particularly those children of the nobility who were visually impaired (Binns, 2013; Tekeste, 2006; Zelalem, 2014).

According to Sergew and Tadesse (1970), noted in their historical record, in the early Ethiopian church schools, children were taught how to read and write in Geez and Amharic. Nevertheless, to address the different need of the blind, the church adapted oral rehearsal as an alternative to reading and writing Geez which was the original language of the religious rituals. It is worth doing to highlight that the Church was fully aware of the necessity to train its own future leaders in such a way that they fulfilled their duties and responsibilities in the society (Binns, 2013; Tekeste, 2006). Such education played a wider role for the increment of the national literacy rate and provided more instruction for adults as well as young pupils including persons with visual disabilities (Zelalem, 2014; Tekeste, 2006; Binns, 2013).

As Tekeste (2006) reported, until the time of emperor Menelik II (1889–1913), education was determined mainly by the church. However, following the introduction of the Western civilization to the country, American Missionaries established the first school for the Blind in the history of special education in Ethiopia at the town of Dembi Dolo in 1925. The second and third special schools for persons with visual disabilities at Entoto and Kasanchis around Addis Ababa. In 1948 by Swedish Missionaries and the government in collaboration with Mennonite Missionaries respectively (Teshome, 2006). The schools started their operation by catering a very few children with visual disabilities by importing teaching materials from America and other Western countries in the form of aid (Teshome, 2006).

However, neither of this nor other similar beliefs described about the population with visual disabilities has no well established research findings (Johnsen 2001). Persons with visual impairments are a diverse group in the society. Hence, they are thin and fat, tall and short, fun loving and irritable. They have all the characteristics found in any group of the society in which they live (Degefa, 2001). The common characteristics that persons with visual impairment viewed differently by different researchers. For instance, Hyvarainnen (1996), states, as blind persons exhibit characteristics such as eye pressing, head banging which is a sign of under

stimulation. Whereas, the report of Scholl (1986) reveals as blind person posses no characteristics specific to themselves as blind persons and show no typical reaction to being blind. He further states that like all people, they are the products of their own unique heredity and environment and are individuals. Thus, it is not possible to generalize about any common characteristics of persons with visual impairments.

The non-disabled persons' refusal to accept the individual difference that persons with disabilities have possessed; and the deep- rooted misunderstanding "disability is inability," denied children with special needs to equal opportunity of education (Tirussew, 2005; UNESCO, 1994). Exclusion of students with visually impaired from any school participation subsequently, has a devastating impact on the physical, social, academic and psychological wellbeing of the group (Degefa, 2001).

As Mastropieri & Scruggs (2010) well noted, most of the barriers associated with education of children with visual disabilities are negative attitudes. As with society in general, these attitudes and stereotypes often stem from lack of knowledge and understanding about the group. The attitudes and abilities of general education teachers can also be taken as major limitations in the process of education of children with visual disabilities (Sherrill, 1993).

As the Ministry of Education, (2012) reported, in Ethiopia, training teachers to understand and work with children with disabilities is often inadequate, fragmented and uncoordinated. If educators have negative attitudes toward students with special needs, then, children will unlikely receive a satisfactory, quality education (Tirussew, 2005). Negative attitudes held by teachers, school administrators, overprotection by parents and lack of motivation of students with visual impairments themselves are critical barriers that hinder their full school participation (Sherrill, 1993; Mastropieri & Scruggs, 2010).

Special Needs
In line with this, and as research finding reveal, the negative attitudes of the society can be a major barrier for the successful inclusion of students with visual impairments in overall school activities (Sherrill, 1998). According to Sherrill, (1998) teachers' negative attitude is the first and

the most impeding factor that contributes to lack of involvement in school activities by students with visual impairments. If the environment in which learning occurs is not supportive to students with visual impairments, their learning will automatically be interrupted (Johnsen, 2001).

Research shows that the context in which the learning occurs; inflexible curriculum, environmental inaccessibility, negative attitude which stems from both teachers and parents and inappropriate assessment procedures are some of the factors that can impede effective school participation of students with visual impairments (Fraser & Maguvhe, 2008).

As Mastropieri & Scruggs, (2010) obviously noted, a student with a disability cannot learn in a regular classroom if he/she cannot enter the room, let alone the school building. Some schools are still inaccessible to students in wheelchairs or to those other mobility aides and need elevators, ramps, paved pathways and lifts to get in and around buildings.

As researchers in the field of special needs education agree, accessibility of school environment can go beyond passageways, stairs and ramps to recreational areas (Sherrill, 1993). Based on the above facts, it is important to be aware about the presence of many factors that can interfere into the education of children with visual impairment to learn with their alongside typical peers. Hence, the inaccessibility of the learning environment is also one of the variables that can interfere in the learning of students who use white-canes. Nevertheless, students with disabilities can participate in unrestricted general school activities if the social and physical environment is accessible. With this, the teaching and learning process of students with visual impairments usually needs modifications for them to be successful (Sherrill, 1998). In order to meet their unique needs, subsequently, students must have specialized services, books and materials in appropriate media like Braille, as well as specialized equipment and technology to assure equal access to the core and specialized curricula, and to enable them to most effectively compete with their peers in school and ultimately in society. Placing a student with a visual impairment in a regular classroom by itself, doesn't ensure the inclusion of the student with visual impairment (Sherrill, 1993). If student with a visual impairment who does not have access to social and physical information because of his/her visual impairment, he/she is not included practically. Students with visual impairments will not be included unless their unique educational needs for access are addressed by specially trained personnel in appropriate environment. Again, unless

these students are provided with equal access to core and specialized curricula through appropriate and specialized books, materials and equipment, no way to make sure the inclusion of the student with visual disability. For quality learning of students with visual impairments, some features and conditions should be adhered to. These include special services from specialized teachers, teaching and learning resources, as well as assistive devices like Braille and magnifying glasses and the use of flexible teaching methods (Webster &Roe, 1998).

Therefore, Sherrill (1993) critically emphasized in his research report, the need for stakeholders of education including teachers to consider the restructuring of the education system and practices as well as modification of the environment in order to assist these students learn better.

Methodology

Qualitative research method was chosen as overall strategy to undertake this study. Specifically, as phenomenological study describes the meaning of the lived experiences for several individuals about a concept or the phenomenon in the human sphere, this design normally enabled researchers to gather deep information and perceptions through inductive qualitative research methods. To know the experience of principals and teachers about the school challenges of students with visual impairment, semi-structured interviews, focused group discussion and observation checklist serve as instruments to dig out information and perceptions from the perspective of the research participants (Bogdan R. and Steven J., 1975; Creswell, 2003).

Weldeya is the town where the study took place, and which is located 527 kilometers northeast from the capital city of Ethiopia. In the town, there are eight governmental and one non-governmental primary schools. There are around 500 teachers and 32 students with visual impairment in these primary schools. The sample design is multilevel in which, participants from three different groups have been   selected. The sampling scheme that the researcher used to recruit was also proportional quota sampling. Hence, three participants from each assemblage of; principals, teachers and students with visual disabilities were employed to undertake the study. Therefore, from each primary school, three/participants wererecruited for the study (Patton, 1990; Bogdan R. and Steven J., 1975).

Instruments

The instruments which the researcher used to collect data were focused group discussion, semi-structured interview and observation checklist. The interviews in this research were conducted in average one hour with each interviewee until a point of data saturation was reached and no new information was gathered (Creswell, 2003). Facilitating the discussion, posing research questions and creating a conducive atmosphere to the discussion were the major roles of the researcher. This was happened deliberately to encourage the participants to speak freely. Subsequently, during the interviews and focused group discussion, field notes were taken by two assistants of the researcher to ensure triangulation (Denzin and Lincoln, 1984).

Data analysis

Data analysis involved gathering information, determining themes and allocating information into the already preset themes. Hence, the preset category technique has been applied to organise the data according to its set of information and eventually, qualitative report has been accomplished (Creswell, 2003; Bogdan R. and Steven J., 1975). To achieve all these things, the data analysis involved the verbatim transcription of the tape recording of each interviewee and focus group discussion. Thereafter the records were analyzed by means of the thematic analysis (Creswell, 2003). Hence; to determine differences, similarities and gaps of the results of this study were compare with already carried out other studies (Denzin and Lincoln, 1984).

Trustworthiness

Though measurements of reliability and validity aren't very big issues in qualitative method, Trustworthiness then becomes the pursuit to produce trusted results (Lincoln and Guba, 1985). In this research therefore; The principles of credibility /checking the truth-value, transferability/the strategy used to attain applicability, dependability/refers to the consistency of the findings and conformability/using the criterion of neutrality as freedom of bias were maintained to ensure trustworthiness (Lincoln and Guba, 1985).

The information obtained from principals, teachers, and students with visual disabilities has been analysed and interpreted with similar themes. However, the first theme discussed in line with the focus group discussants only. The rest of the themes have been triangulated. the analysis,

therefore, involved three themes in common in each group for the purpose of data triangulation. Hence, as it is already mentioned, Theme one involved only principals and teachers. This was done deliberately to know the awareness that principals and teachers have towards students with disabilities.

Findings

Among principals and teachers, two of them were females and the other four were males. Their teaching experience ranged between fifteen and thirty years. Their age also fell between thirty-eight and fifty-three. All of them have received their first degree. Whereas, the three interviewees with visual disabilities were between age 18 and 20 years, two of them are from grade eight and the one was from grade seven.

Theme one Awareness

Discussant 1: "*It is my first experience. I began to teach the group since I was transferred from rural school to urban.*"

Discussant 2: "*For the last ten years, I have served as a school director. Since that time, I am administrating students with visual impairment. Currently, the school has about five such students.*"

Discussant 3: "*As a director, I see some students with visual impairment. But I didn't teach them so far.*"

Discussant 4: "*Even though I do not have special training, I am teaching them for the last two years.*"

Discussant 5: "*This semester, I am not teaching in the classrooms where students with visual disabilities are enrolled. However, as I took different trainings organized by US aid, I feel ease when I teach them.*"

Discussant 6: "*Among five of my classrooms, there are two   students with visual disabilities. As I didn't take course or other training regarding visual disabilities, it is challenging to teach them.*"

It is clear that all participants had exposure to students with visual disabilities. Discussant 5 was the only participant who felt easy to teach the group as she had trainings. the three principals

were much reserved to express either their comfort or discomfort in the process of teaching students with visual disabilities. However, teacher 1 and 3 forwarded their incompetency to teach the target group due to lack of training. Creating awareness regarding the nature and needs of students with visual disabilities could alleviate the feeling of incompetency that was created among teachers. In proportion to this, adequate training for teachers as well as principals could also improve the positive attitude that they had towards students with special needs. In favor of this, Norwich (2002) recognised the paramount importance of teachers' attitude that they possessed for the academic success of students with disabilities in inclusive classroom. In line with this, a survey, which was conducted in the other town of Ethiopia, reported teachers' reluctance to support children with disabilities in Bahir dar primary schools (Dagnew, 2013).

Theme Two School Support for Students with Visual Disabilities

Discussant 1: "*They have stipend of 350 Birr from regional education bureau. So far, no different support for these students from others. Even to support them financially, guideline or budgetary instruction is required.*"

Discussant 2 agreed with discussant 1 regarding the amount of money that the students were receiving. He added, "*But since our school is financially weak, we aren't able to furnish the group with teaching material.*"

Discussant 3 repeated what the two discussants remarked concerning the pocket money that students with visual disabilities were receiving. He added the following points: "*I don't think it is possible to support them at school level. NGOs should fulfill the extra need of students with special needs. We don't have budget assigned for such purpose. so we can't afford them.*"

Discussant 4: "*I am simply a teacher. I am not expected to do something. if support is needed, it should be from school. Off course, during examination, I read them. I feel that trained teacher is required to assist them.*"

Discussant 5: "*I give them my teaching note. I also encourage them to participate in the classroom.*"

Discussant 6: "*I do not have training which enable me to support them. I feel pity of them but I can't do anything.*"

To triangulate the preceded data, the interview report from students with visual disabilities has been presented as follows. As interviewees unanimously reported, to be effective in their education, the school should provide them with Braille equipment; such as slate and stylus, Braille paper, abacus, white-cane and tutors. the interviewees also forwarded their complaint further about poor attention that they are receiving from the directors. Whenever they ask about additional bursary and supply of Braille equipment, the usual answer that they were receiving from school principals was "no budget". As they informed the researcher, most students with disabilities were from rural and poor families. Hence, they weren't able to be provided with the necessary learning materials. They also believed that the schools couldn't treat them equally with sighted students not alone to meet their special needs. They justified this by listing the provision of chalk, blackboard, ink-printed books and all other things were for the sake of sighted friends.

Evidently, there are research findings which colabourate the preceded accounts made by students with disabilities. For instance, Dagnew (2013) and Lewis (2009) have found out the prevalence of inadequate school support for students with disabilities. Not only the regular schools, even the special school of students with special needs have been observed as they were poorly staffed, under-resourced, and generally concentrated in urban areas (Lewis, 2009).

The need of students with visual disabilities can be addressed if they were provided with teaching equipment such as; Braille-paper, abacus, slate and stylus for those who are blind. As well as magnifiers, large prints and contact lens for those who have low vision (Sherrill, 1998). Inevitably, schools are supposed to facilitate students with disabilities with appropriate support not only to retain but also to minimize school dropout of the group (UNESCO, 2005). As informants reported and as it was observed, one of major educational challenges of students with visual impairment in the primary schools of the study area has been poor provision of adapted material. In favour of the above fact, Bishop (1996) suggested the need of adapting teaching materials to improve academic achievement of students with visual impairment.

To the reverse, students with visual disabilities in Weldeya primary schools were not receiving both financial and material support from their respective schools other than the bursary that regional bureau has already allotted. Regarding school support, the principals have confirmed as

the target group were receiving monthly bursary from the education bureau of the regional state of Amhara. The feedback of the principals unanimously showed to what extent financial statements were challenging them to take measures in order to support students with visual disabilities. It is also worth doing to highlight how lack of teachers' training has impacted the delivery of education for the target group. As it is recognized by UNESCO (2005), stipulating school policy regarding students with special needs and producing well-trained teachers has a paramount importance not only to make education accessible but also to ensure quality education for children with special needs.

Further, placing children with special needs in the regular classroom by itself is not a remedial measure to tackle exclusionary factors against students with disabilities. Rather, facilitating with modified learning material and teaching methodology is guarantee for the academic wellbeing of the group (UNESCO, 2005).

Theme Three Environmental Accessibility

Discussant 1: "*The school is accessible to some extent.*"

Discussant 2: "*The entry of some classrooms requires short jumping.*"

Discussant 3: "*Our school isn't designed considering blind students. that is why there are ditches, poles and other kinds of obstacles here and there.*"

Discussant 4: "*Students with visual disabilities inter in to all classrooms, but not with confidence. they need support from their classmates sometimes.*"

Discussant 5: "*No environmental modification at all. Therefore, sometimes they bump to poles and need sight guide to inter some classrooms.*"

Discussant 6: "*the school is designed for sighted students. so, it is not accessible for students with visual disabilities. If I were in the position of school head, I would urge education bureau to construct special class for them.*"

In line with this, discussants with visual disabilities have reported the presence of environmental barriers in order to move from classroom to classrooms as well as from playgrounds to buildings safely. For them, carelessly erected poles and uncovered ditches are the main obstacles not to

study with their counterparts and participate in social events outside the classrooms. Hips of stone and other which are leftover during the previous constructions were barriers in two schools out of the three primary schools.

Even the data obtained via observation checklist revealed as most of school areas were covered with piles of stone, wood, and broken chairs. Carelessly erected poles and open ditches were the other threats for free movement of students with visual disabilities. Amongst other things, environmental barrier was the one which often got in the way of equal participation of students with visual disabilities. The data obtained through observation checklist and focused group discussion was a very good witness to be aware of the environmental difficulties that students with visual problems faced in the primary schools of Weldeya town. Observably, the social interaction of students with visual disabilities was so limited due to the environmental hazards in these primary schools.

The removal of the physical environment subsequently can enhance the overall school participation of students with visual disabilities. According to Bishop (1996), modification of the physical environment become paramount, if they have to participate in all the things other students without visual impairments participate in the school.

As research findings show, next to attitudinal barrier, the most obvious impeding factor for persons with disabilities is environmental inaccessibility (Johnsen 2001). As principals and teachers together reported and as it was observed, students with visual disabilities were precluded from co-curricular activities and some social events with in the primary schools due to aforementioned physical barriers. To reverse the situation, therefore, adaptations of teaching materials   and modification of the physical environment become paramount; if they have to participate all the things other students without visual impairments participate in the school (Bishop, 1996).

Theme Four Classroom Instruction

Except discussant 5, the rest of discussants admitted their inconsiderateness of students with visual disabilities in the classroom. For instance, discussant 1: "I teach biology, therefore, I use

diagrams and charts to simplify lessons like blood circulation, resparatory organs and others. However, I don't know how to modify these diagrams into Braille." Discussant 4: "I don't think as it is my responsibility to adapt diagrams and maps. Rather, trained personnel should be assigned to accomplish such tasks."

To evident the above account, students with visual impairment together reported the following regarding classroom instruction: teachers used to write notes on the blackboards silently. These idled students with visual disabilities. As they have noticed, the process consumed much of the class time. The interviewees therefore, aren't getting something from such proceed. Hence, to ensure equal benefit of the class, the group recommended teachers to narrate or verbalize what they write on the board.

The other comment forwarded by the students with visual disabilities was regarding lesson modification; most often, teachers draw pictures, diagrams, and charts on the wall of the classroom. However, they do not mind our presence. If they did, they could either produce tactile teaching aid or give verbal explanation of the visualized lesson.

To cop-up with sighted students, indisputably, students with visual disabilities require extended time during assessment and submission of assignments as they remarked. For this lack of training has hampered teachers not to meet the instructional need of students with disabilities in Weldeya primary schools. Even, due to teachers' inability to read Braille, students are not expected to complete homework and take notes in class, unlike their sighted peers (Louis, 2009).

Therefore; the content, method, teaching material, and other related activities, which are provided for students with disabilities, should be accessible and flexible. Curriculum must take into consideration the different abilities and needs of all students. It must be capable of being adapted and modified to meet the need of all children. Flexible time frames for work completion, differentiation of tasks, and flexibility for teachers and time for additional support are some of strategies to meet specific need of children (UNESCO, 2005). In addition to this, flexible teaching-learning methodology is also necessary to realize inclusion. Access to the curriculum is so much more than simply including a student with disability in a regular classroom. Further, the

systematic way of classroom organization and the arrangement of teaching materials should be considerations that must be taken in to account during education of the disability group.

Conclusion

As the research findings show, the students with visual disabilities have faced enormous obstacles to precede their education competently likewise other non-disabled schoolmates. The primary schools where this study was conducted have been identified as they weren't providing special support for students with visual problems. Hence, no matter how these children have a right to receive quality education, because of multifaceted factors, they weren't being catered in the expected manner. For this;

- lack of trainings among teachers

- inaccessibility of school environment

- inflexible financial statement

- lack of awareness among school principals about the necessity of devising special provision are some of the findings that jeopardize the quality education of the group in the primary schools of primary schools of Ethiopia. Based on the above fact, the researcher intented to suggest remedials actions hereunder.

- ❖ The regional education bureau in collabouration with non-governmental organisations should come up with strategies that could help how to sensitize issues of disability to teachers, students, school administrators and stakeholders so that they can contribute to successful inclusion of students with visual limitation.

- ❖ Teacher education institutes should provide practical oriented courses of inclusive education for preservice teachers in order to raise their awareness towards disability issues and equip them with basic skills of Braille as well as orientation andn mobility.

- ❖ Financial and other school guidelines should be designed flexibly to address the special needs of students with disabilities.

References:

Binns, J. (2013). Out of Ethiopia – A different way of doing theology. *International Journal for the Study of the Christian Church, 13*(1), 33–47.
Bishop, V (1996). Teaching Visually Impaired Children (2nd Ed).U.S.A: Charles C Thomas Publisher.

Bogdan R., Steven J. (1975). Introduction to Qualitative Research Method – A Phenomenological Approach to the Social Sciences. New York: John Wiley & Sons.

Creswell. J.W. (2003) Research Design: Qualitative, Quantitative and Mixed Methods Approaches. London: Sage. 2nd ed.

Degefa Abdi, (2001). The attitudes of students with visual impairments toward physical education; Unpublished master thesis. Addis Ababa University School of graduate; Addis Ababa, Ethiopia.

Dagnew, A. (2013). Factors affecting the implementation of inclusive education in primary schools of Bahir Dar town administration. Education Research Journal, vol. 3, no.3, pp. 59- 67.

Denzin, N.K. and Lincoln, Y.S. (1984), Handbook of Qualitative Research, Newbury Park: Sage Publications.

Fraser, W. & Maguvhe, M. (2008). Teaching Life Sciences to Blind and Visually Impaired

Learners. South Africa: University of Pretoria.

Hyvarinen, L. (1996). Eyes and Vision. Helsinki: University of Joensuu (UN-published paper).

Johnsen, B. H. (2001). Curricula for the Plurality of Individual Learning Needs: Some Thoughts concerning Practical Innovation towards an Inclusive Class and School. In Johnsen M., and Skjørten D., (Eds.), Education – Special Needs Education: An

Introduction. Oslo: Unipub.

Lincoln, Y.S. and Guba, E.G. (1985) Naturalistic inquiry. Beverley Hills, CA: Sage.

Lewis, I. (2009). Education for disabled people in Ethiopia and Rwanda. (retrieved November   25, 11, 2017),: http://unesdoc.unesco.org/images/0018/001865/186564e.pdf.

Mastropieri, M.A. & Scruggs, T.E. (2010). The Inclusive Classroom: Strategies for Effective

differentiated Instruction. New Jersey: Upper Saddle River.

Patton, M. Q. (1990). Qualitative research and evaluation methods (2nd ed.). Newbury Park, CA: Sage.

Scholl, G. T. (1986). Foundations of Education for the Blind and Visually Handicapped Children and Youth. Theory and Practice. New York: American Foundation for the Blind, Inc.

Sergew, H. Sellassie, and Tadesse T. (1970). the church of ethiopia: a panorama of history and spiritual life. Addis Ababa University press, Ethiopia.

Sherrill, C. (1998). Adapted physical activity, recreation and sport cross-disciplinary and lifes. pan. Boston: McGraw-Hill.

Sherrill, C. (1993). Adapted Physical Activity, Recreation, and Sport Crossdisciplinary and Life span (4th. ed.). Madison: Brown & Bench mark Publishers.

Tekeste, N. (2006). Education in Ethiopia. From crisis to the brink of collapse. Uppsala: Nordiska Afrikainstitutet.

Teshome, A. (2006). Contribution to access and quality of education for children with Visual Impairment in Addis Ababa. Addis Ababa, Ethiopia.

Webster, A. & Roe, J. (1998). Children with Visual Impairment: Social Interaction, Language

ministry   and Learning. London: Routledge.

Zelalem, T. (2014). The journey of special needs education in Ethiopia: An overview. Journal of Education and Practice; 5, (27), 85-93.

A Professional Development Training Model for Improving Co-Teaching Performance

Kara L. Faraclas,
Department of Special Education and Reading,
Southern Connecticut State University,
USA

Abstract

Co-teaching is a promising practice for educating students with disabilities in regular education classes. However, teachers often report being given co-teaching assignments without requisite training. Without adequate preparation, many teachers have difficulty conceptualizing co-teaching as a model and working collaboratively as teaching partners, often creating a division of labor that relegates special educators to a "helper" role in the classroom. This experimental study utilized a randomized pretest-posttest control group design to study the effects of a professional development training package on the collaborative teaching performance of regular and special education teachers. Analysis of covariance showed that teachers who participated in professional development training on co-teaching had significantly higher posttest scores on a co-teaching performance assessment than those who did not participate in training.

Keywords: *co-teaching, collaboration, professional development, teacher education, teacher training, inclusion, students with disabilities, special education, effective teaching, research*

Introduction

An increasing number of students with disabilities receives instruction in regular education classrooms, with 62 percent of all students with disabilities in the U.S. receiving the majority of their instruction in regular education classes in the 2013-14 school year (U.S. Department of Education & National Center for Education Statistics, 2016). At the same time, regular education teachers report that they are inadequately prepared to instruct students with disabilities (Kahn & Lewis, 2014; Reinke, Stormont, Herman, Puri, & Goel, 2011; Stormont,

Thomas, & VanGargeren, 2012) possibly because of insufficient coursework and experience at the pre-service level (Rosenzweig, 2009). Regular educators also report they are not informed about the needs of their students with disabilities and do not receive necessary support to address those needs (Allday, Neilsen-Gatti, & Hudson, 2013; Grskovic & Trzcinka, 2011; Vitelli, 2015).

Regular and special education teachers come to co-taught classrooms with different backgrounds, training and experiences, and may have dissimilar perspectives on classroom management, instruction and assessment. Having distinct sets of skills, regular educators specialize in delivering content, and special educators' expertise centers on individualizing instruction for students with disabilities (Friend, 2008; Grskovic & Trzcinka, 2011; Shippen et al., 2011). As co-teachers, both regular and special educators may lack adequate administrative support, professional development training, and time in their schedules to plan and coordinate work with their counterparts (Reinke, Stormont, Hermon, Puri, & Goel, 2011; Shippen et al., 2011; Stormont et al., 2012).

Several collaborative models have emerged to meet the instructional challenges of educating students with disabilities in the regular education classroom, including teacher collaboration, consultation, peer coaching, collaborative learning communities and co-teaching (McDuffie, Mastropieri, & Scruggs, 2009). Of these, co-teaching has become the most popular collaborative approach for providing instruction to students with disabilities in regular education classrooms (Magiera & Zigmond, 2005; McDuffie, Mastropieri, & Scruggs, 2009). Simply defined, co-teaching is a model that involves paired regular and special education teachers working together to plan, instruct, and monitor progress for a heterogeneous group of students, with and without disabilities, in the same classroom (Kloo & Zigmond, 2008).

Although research on co-teaching is limited (Magiera & Zigmond, 2005; Murawski & Swanson, 2001), some studies have shown it to be a promising practice for effectively educating students with disabilities in regular education classes (Fontana, 2005; Fore et al, 2008; Murawski & Swanson, 2001). Barriers to effective implementation of co-teaching practices include: (1) lack of training for co-teachers, (2) lack of time for collaborative planning and assessment, (3) lack of fidelity in implementation of co-teaching methods, (4) lack of special education services given to students with disabilities in co-taught classes and (5) lack of parity between co-teachers (Keefe & Moore, 2004; Magiera, Smith, Zigmond, & Gebauer, 2005; Moin, Magiera, & Zigmond, 2009; Murawski, 2009; Rivera, McMahon, & Keys, 2014).

Professional development is one avenue for providing practicing teachers with skill development in co-teaching. However, research on the effectiveness of professional development programs to produce positive teacher and student outcomes is relatively new (Darling-Hammond, Wei, Andree, Richardson, & Orphanos, 2009; Snow-Renner & Lauer, 2005). Evidence from a small set of empirical studies indicates that effective professional development is characterized by five key elements: sufficient duration, content focus, coherence, active learning, and collective participation (Darling-Hammond et al., 2009; Garet, Porter, Desimone, Birman & Yoon, 2001; Snow-Renner & Lauer, 2005; Wei et al., 2009; Weiss, Banilower, Overstreet, & Soar, 2002; Yoon, Duncan, Lee, Scarloss, & Shapely, 2007). Researchers also have identified the need for observation, practice and feedback in teacher professional development programs to ensure fidelity in the implementation of instructional practices (Harris

et al., 2012; Stormont et al., 2012). There is a much smaller research base related to professional development for educators working with students with disabilities (Birman et al., 2007; Darling-Hammond et al., 2009; Parsad, Lewis, & Ferris, 2001), and very few published research studies on the effect of professional development on co-teaching (Sankar, 2009; Bond, 2011).

In the current environment where the majority of students with disabilities receive instruction in regular education classrooms for the majority of their school day and co-teaching is the predominant model for including students with disabilities in regular education classes, the absence of peer-reviewed literature on professional development training specific to co-teaching is surprising and points to an area of vital interest for investigation. The purpose of this study was to examine the effects of professional development training on the co-teaching performance (co-planning, co-classroom management, co-instruction, co-behavior management and co-assessment) of regular and special education co-teachers. Also, of interest were the extent to which co-teacher dyads use a variety of co-teaching methods and the extent to which co-teachers work collaboratively to effectuate co-teaching practices.

Method

Participants

Participants in this study included 48 regular and special education teachers in 24 co-teaching dyads from four middle schools and three high schools in two urban and two suburban school districts in the northeast region of the United States. To be eligible for this study, teachers had to be co-teaching at least one class in the current academic year and agree to participate as a dyad with their co-teaching partners. For the purposes of this study co-teaching was defined as the delivery of instruction to a heterogeneous group of students, with and without disabilities, in a single classroom by an assigned teaching dyad, consisting of a licensed regular education teacher and a licensed special education teacher. Pairs of participants were randomly assigned to treatment and control groups.

The majority of teachers had at least a Master's degree (87.5%) and had been teaching longer than ten years (70.8%). Yet, as a group, they had very little training in co-teaching. The majority of teachers (68.8%) had no college coursework in co-teaching, and 72.9% had six or fewer hours of professional development training in co-teaching. None of the teachers in the study were dually certified in regular and special education.

Design

This experimental study employed a randomized pretest-posttest control group design to examine the effects of a professional development training package on the observed co-teaching performance of co-teacher dyads over a 15-week period. Participants completed a *Demographic Survey* at the outset of the study to provide information about their education, prior experience and training in instructing students with disabilities and co-teaching. Data were also collected via classroom observations during pre- and post-treatment phases of the study. Co-teaching dyads were observed for approximately 55 minutes during a regularly scheduled class period, prior to and upon completion of professional development training. The observation period began as

students entered the classroom and ended when students left the room at the end of the class period. The researcher-developed *Performance Assessment for Co-Teachers* (PACT) instrument was used to assess each dyad's performance in areas of co-planning, co-classroom management, co-instruction, co-behavior management and co-assessment. Guided by the PACT, the observer noted evidence of co-teaching practices, such as which special education services were delivered to students with disabilities, how often each teacher took lead and support instructional roles, and whether teachers shared responsibility for all students. Information gathered was used to rate the dyad's performance on each co-teaching practice item on the PACT.

Research-based professional development training for treatment group participants began after pre-treatment observations were completed. During the first phase of the eight-week training period, treatment group participants received five two-hour professional development sessions, which included instruction and practice in five areas of co-teaching performance. The treatment group was divided into five sub-groups to allow participants from the same school to be trained together. In the second phase of treatment, the researcher observed each treatment dyad in their co-taught classes. After the observation, the researcher met with the teachers to provide feedback on their co-teaching performance, constituting the final training session. Teachers in the control group continued their normal co-teaching routines during the treatment period and did not participate in professional development provided through this study.

Description of Professional Development Training Design

The training curriculum used in this study was designed by the researcher based on empirically-validated best practices in professional development. The training package incorporated six elements of professional development training—sufficient duration, collective participation, content focus, coherence, active learning, and observation and feedback—which are described below and summarized in Table 1.

Sufficient Duration. While brief workshops (less than one day) tend to be the norm for professional development in educational settings (Birman et al., 2007; Darling-Hammond et al., 2009; Fennick & Liddy, 2001; Parsad, Lewis, & Farris, 2001), change in instructional practices in the classroom is more likely to occur when professional development is completed as on-going training, including more hours over a longer period of time (Darling-Hammond et al., 2009: Garet et al., 2001; Snow-Renner & Lauer, 2005; Weiss, Banilower, Overstreet, & Soar, 2002; Yoon et al., 2007). Treatment participants in this study received on-going professional development, consisting of just over eleven hours of formal training in six sessions, over an eight-week period

Collective Participation. Professional development is enhanced by collective participation, which involves the contemporaneous training of more than one person from a school, allowing a support system for learning, validating and adopting teaching practices (Darling-Hammond et al., 2009; Snow-Renner & Lauer, 2005). In this study, teachers were trained as co-teaching pairs, with multiple dyads of regular and special educators participating from selected schools.

Content Focus. Content-focused training addresses specific instructional and assessment skills identified as necessary for effective teaching (Darling-Hammond & McLaughlin, 1995;

Snow-Renner & Lauer, 2005; Wei et al., 2009). The professional development curriculum for this study consisted of best practices in the five areas of co-teaching performance—planning, classroom management, instruction, behavior management and assessment (Friend, 2008; Howard & Potts, 2009; Murawski, 2009). The planning, implementation, management and assessment of special education services to students with disabilities, such as accommodations, modifications and specialized instructional and behavior strategies, were integral components of the co-teaching model applied in this study.

Coherence. Coherence is the congruence of professional development curriculum with state and district standards and school and classroom goals and practices (Darling-Hammond et al., 2009; Garet et al., 2001; Snow-Renner & Lauer, 2005). The intervention applied in this study was consistent with current state education reform initiatives emphasizing evidence-based instructional practices, academic achievement for all students, assessment and continuous monitoring of student progress, and the provision of academic and behavior supports to meet the needs of all students.

Active learning. Opportunities to learn through participation and practice provide an active-learning experience, which contributes to development, refinement and mastery of skills (Garet et al., 2001; Ross & Bruce, 2007; Wei et al, 2009). In this study, co-teaching pairs worked together to complete hands-on activities and practice skills developed through training, supervised co-planning, self-assessment, observation and feedback.

Observation and feedback. Observation and feedback provide critical information to guide correction and further refinement of instructional skills (Ross & Bruce, 2007; Spencer & Logan, 2003; Stormont, Thomas, & Van Garderen, 2012). The professional development training program applied in this study included classroom observations conducted by the researcher, with feedback provided to dyads in the treatment group prior to the final observation.

Table 1. Best Practices in Professional Development Training

Component	Best Practices	Application in Training
Sufficient Duration	• On-going training over period of time is more effective than one-day workshops • Allows participants to process, practice and integrate material	• 6 sessions over 8-week period • 2 hours/session
Collective Participation	• Contemporaneous training of more than 1 person from a school	• Co-teachers trained together • Multiple dyads from same school trained together
Content Focus	• Training addresses specific instructional and assessment skills identified as necessary for effective teaching	• Training covers 5 areas of co-teaching performance • Delivery of special education services (e.g., accommodations, specialized instruction) embedded in 5 areas of co-teaching

Coherence	• Congruence of PD curriculum with state & district standards and initiatives, and school/classroom goals and practices	• PD consistent with current state reform initiatives • Research-based, differentiated instruction • Assessment and ID of students not meeting standards • Academic and behavior support to meet needs of all students
Active Learning	• Opportunities to learn through participation and practice	• Teachers work together to complete activities and practice skills through training, co-planning and self-assessment
Observation and Feedback	• Provide critical information to guide correction & refinement of instructional skills	• Co-teaching dyads observed and given feedback on co-teaching practices

Description of Professional Development Training Content

The content of the training included five areas of co-teaching—planning, classroom management, instruction, behavior management and assessment—which are described below and summarized in Table 2. Training in co-teaching methods was designed to foster parity between co-teaching partners, and to provide teachers with research-based strategies to effectively instruct students with disabilities.

Planning. Co-teachers who plan lessons together maximize instructional effectiveness in the classroom (Friend, 2008; Gately & Gately, 2001; Howard & Potts, 2009; Murawski, 2009). Training established the need and provided strategies for co-teachers to (1) co-plan lessons by contributing from their areas of expertise (Friend, 2008), (2) include accommodations and modifications to meet the needs of students with disabilities (Howard & Potts, 2009; Murawski, 2009) and (3) share equal responsibility for planning for all students (Friend, 2008). Treatment participants worked in small groups to identify barriers to and "brainstorm" potential solutions for effective co-planning. Participants worked with their partners to establish a regular meeting schedule and agenda that included a variety of communication opportunities for co-planning, and explore materials to support the co-planning process (e.g., sample co-planning agenda, lesson plan format). Finally, participants were provided with supervised co-planning time (20-30 minutes) during each training session so they could practice planning lessons that incorporated best co-teaching practices (co-managing the class, using variety of co-instruction methods, co-managing behaviors and co-assessing student performance).

Instruction. Effective co-teaching utilizes a variety of instructional strategies to support needs of all students, improves intensity and continuity of instruction and provides more opportunities for student participation, all of which result in improved outcomes for all students (Cook & Friend, 1995). Training established the need and provided strategies for teachers to (1) participate equally in the delivery of instruction, (2) utilize a variety of co-teaching methods, equally sharing lead and support roles and (3) provide specialized instruction to all students with disabilities, as needed (Friend, 2008; Murawski, 2009). Treatment participants worked in small groups to identify advantages and challenges of co-teaching methods, to identify potential sources of conflict in co-instruction, to use strategies to solve problem scenarios involving co-instruction and to explore instructional materials (e.g., resource lists, graphic organizers and

teacher self-assessment forms). Finally, participants worked with their partners to co-plan and implement a lesson using research-based instructional strategies and graphic organizers.

Classroom management. Co-teachers need to agree on classroom structures and routines to establish an organized, consistent approach to managing teaching and learning tasks (Friend, 2008; Gately & Gately, 2001; Wong, Wong, Rogers, & Brook, 2012). Training in this area established the need and provided strategies for co-teachers to establish professional parity in (1) the physical classroom environment, (2) interactions with students and (3) the daily management of classroom rules, routines and expectations (Friend, 2008; Murawski, 2009). Treatment participants worked in small groups to identify advantages and challenges of classroom management strategies, identify potential sources of conflict in co-classroom management and use strategies to solve problem scenarios involving co-classroom management. They were given materials to create (or further develop) a co-classroom management plan or improvement plan with their co-teaching partners. Finally, participants worked with their partners to co-plan and implement a lesson in a way that demonstrates parity in teacher-student relationships and the management of structures and routines.

Behavior management. Co-teachers must work collaboratively to develop strategies to establish a consistent, unified approach to manage challenging student behaviors and minimize disruptions in learning activities in co-taught classrooms (Friend, 2008; Gately & Gately, 2001; Murawski, 2009; Potts & Howard, 2011). Training in this section established the need and provided strategies for co-teachers to establish parity in the development and implementation of (1) positive reinforcement, (2) redirection of off-task behaviors and (3) reactive behavior strategies in their classrooms to reduce classroom disruptions and inappropriate behaviors (Friend, 2008; Murawski, 2009). Treatment participants worked in small groups to identify advantages and challenges of behavior management strategies and use strategies to solve problem scenarios involving co-behavior management. Co-teachers were given materials to create (or further develop) a differentiated instruction and behavior plan to meet learning and behavior needs of a student with challenging behavior(s). Finally, treatment participants worked with their partners to co-plan and implement a lesson using research-based behavior strategies.

Table 2. Best Practices in Co-Teaching

Component	Best Practices	Application in Training
Co-Planning	• Teachers plan lessons together—each contributing from area of expertise • Include individual accommodations/ modifications • Share equal responsibility for all students	• Materials to support co-planning • Provide co-planning time each session (20-30 min.) • Identify potential accommodations/ modifications, co-teaching methods
Co-Classroom Management	• Agreement on class management structures and routines • Parity in physical environment (desk, storage, materials) • Parity in classroom management (lead & support roles)	• Discuss advantages & challenges of classroom management methods • Identify potential sources of conflict and problem-solving strategies • Include materials to develop or improve classroom management plan

Co-Instruction	• Share lead & support roles equally in instruction • Use variety of co-teaching methods • Provide specialized instruction to students with disabilities	• Discuss pros and cons of co-teaching methods • Identify potential sources of conflict and problem-solving strategies • Include instructional strategies for students with disabilities
Co-Behavior Management	• Agreement for consistent approach to behavior management • Parity in development and implementation of strategies (e.g., positive reinforcement and manage inappropriate behaviors)	• Discuss pros and cons of particular behavior strategies • Self-assessment of collaborative development and implementation of behavior management • Include use of differentiation for behavior management
Co-Assessment	• Collaborative development & implementation of assessment and progress monitoring activities • Adjustment of instruction when students not making progress	• Discuss pros and cons of assessment strategies • Self-assessment of collaborative development and implementation of assessment strategies • Include materials to develop/ improve assessment plans for their classroom

Assessment. It is essential for co-teachers to work collaboratively to develop strategies to assess student understanding and performance, monitor student progress and adjust instruction to meet the needs of all students (Friend, 2008; Gately & Gately, 2001; Murawski, 2009; Potts & Howard, 2011; Salvia, Ysseldyke, & Bolt, 2013). Training in this section established the need and provided strategies for co-teachers to achieve parity in the development and implementation of (1) data collection and assessment activities, (2) monitoring student work and responses, (3) making modifications to instruction when students fail to make satisfactory progress (Murawski, 2009; Potts & Howard, 2011). Treatment participants worked in small groups to identify advantages and challenges of assessment strategies and used strategies to solve problem scenarios involving co-assessment. Co-teachers were given materials to create (or further develop) an assessment plan for their classrooms. Finally, treatment participants worked with their co-teaching partners to co-plan and implement a lesson using identified assessment strategies.

Measures

An extensive review of the literature failed to identify an observation instrument that could measure all five areas of co-teaching performance addressed in this investigation—co-planning, co-classroom management, co-instruction, co-behavior management and co-assessment. Therefore, data collection instruments were designed by the researcher for this study—a demographic survey and a co-teaching observation instrument—based on the research literature describing best practices for co-teaching.

Demographic survey. To establish baseline data about treatment and control participants, a *Demographic Survey* was administered to both groups at the beginning of the

study. This instrument, consisting of eleven multiple-choice items, was used to collect information about participants' teaching certification, level of education, and years of experience teaching, co-teaching and teaching with current co-teaching partner. Participants were asked to identify the number of college courses taken as well as the number of hours of professional development training they had received in the areas of regular education, special education and co-teaching. The surveys were identical for regular education and special education teachers.

Performance assessment for co-teachers. The *Performance Assessment for Co-Teachers* (PACT) is a scaled instrument designed to measure the degree to which co-teaching dyads collaboratively use co-teaching best practices in their classrooms. The instrument contains 15 items in five areas of co-teaching: co-planning, co-classroom management, co-instruction, co-behavior management and co-assessment. Each co-teaching dyad was observed and given a performance rating for each PACT item, using a four-point scale to indicate the degree to which teachers collaboratively used best practices in co-teaching. The PACT yielded a total score, with a score range of 15-60, and five subscale scores, each having a score range of 3-12.

To evaluate content validity, the PACT instrument was reviewed by an expert panel consisting of eight special educators with advanced degrees and co-teaching experience in K-12 classrooms and a senior university faculty member. Other than recommendations for minor revisions, the instruments were found by the panel to be appropriate for their intended purposes. Scale reliability was assessed for the PACT instrument using Cronbach's Alpha. The Cronbach's Alpha for the PACT = .755, which is within the conventional standards for scale reliability. To examine the potential for observer bias, a second observer was trained to conduct pre-treatment PACT observations for 30% (n=7) of treatment and control dyads, but was blind to the assigned treatment condition. Inter-rater reliability between the researcher and second observer on the PACT was assessed using a percent agreement consensus estimate. Interrater agreement was 85.7% for the PACT.

Fidelity of implementation. Four tools were used to ensure that professional development training was consistently implemented across the five treatment subgroups. A detailed training calendar/schedule was used as a checklist to document the implementation of 36 treatment dyad observations and 30 training sessions. A set of five checklists was used to document the implementation of content for each training session. A set of five activity folders containing the activity-related materials and instructions for each training session served as an additional checklist to ensure the inclusion of all intended activities at each training session. Finally, feedback to participants was guided by a detailed rubric (checklist) used during teaching observations. The only deviation from the original plan was the rare rescheduling of sessions in response to weather-related cancelations or participant illness.

Results

Comparison of Demographic Characteristics of Participants
The Pearson chi-square test was used to identify differences in demographic characteristics between groups. No significant differences were found between treatment and control groups.

There were no significant differences between regular and special educators in education levels, number of years teaching and co-teaching, number of years teaching with current co-teaching partner or training in their respective disciplines. However, special educators had significantly more college courses and professional development training in co-teaching than the regular educators (p = .047 and p = .006, respectively), as shown in Table 3.

Table 3. Comparison of Demographic Characteristics for Special and Regular Educators

Characteristic	Special Educators (n=24)	Regular Educators (n=24)	Pearson Chi-Square	df	p-Value
Co-Teaching College Courses					
None	13	20			
1 class	3	4	9.627	4	0.047
2 classes	4	0			
3 classes	2	0			
More than 3	2	0			
Co-Teaching PD					
None	3	15			
1-3 hours	5	5			
4-6 hours	6	1	16.343	5	0.006
7-10 hours	3	2			
11-20 hours	6	1			
More than 20	1	0			

Comparison of Observed Co-Teaching Performance

Post-treatment PACT scores were compared to identify differences between dyads that received co-teaching training and those that did not. Table 4 shows mean and standard deviations for pretest and posttest scores on the PACT for treatment and control groups. The treatment group's mean posttest PACT score (M=39.83, SD=5.09) was higher than the mean for the control group (M=28.83, SD=3.56), showing that dyads receiving co-teaching training had higher scores on their co-teaching performance. One-way analysis of covariance (ANCOVA) was used to compare mean differences in posttest PACT scores between treatment and control group dyads, adjusting for variations in pretest scores. ANCOVA results, shown in Table 5, revealed that the difference in posttest PACT scores between groups was significant, $F(1, 21) = 76.584$, $p < 0.001$) and the effect size was large ($\eta_p^2 = .785$).

Table 4. PACT Pretest and Posttest Means (Standard Deviations) and Adjusted Posttest Means for Treatment and Control Groups

Scale	Treatment (n=12 pairs)	Control (n=12 pairs)
Total		
Pretest	28.33 (4.05)	28.33 (3.89)
Posttest	39.83 (5.09)	28.83 (3.56)
Adjusted Posttest	39.83	28.83

Table 5. Analysis of Covariance on PACT Posttest Scores between Treatment and Control Groups

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	952.258[a]	2	476.129	50.226	.000	.827
Intercept	55.869	1	55.869	5.894	.024	.219
Pre-Observation Total	226.258	1	226.258	23.867	.000	.532
Group Type	726.000	1	726.000	76.584	.000	.785
Error	199.076	21	9.480			
Total	29442.000	24				
Corrected Total	1151.333	23				

[a] R Squared = .827 (Adjusted R Squared = .811)

Comparison of Co-Teaching Methods Used

Item 8 on the PACT measured the extent to which co-teachers used a variety of co-teaching methods (i.e., *one teach/one observe, parallel teaching, station teaching, alternative teaching, team teaching* and *one teach/one assist*). A comparison was made between the pre- and post-treatment performance of dyads in the treatment and control groups. As shown in Table 6, the majority of co-teaching dyads in both groups relied exclusively or heavily on *one teach/one support* co-teaching methods (i.e., *one teach/one assist* and *one teach/one observe*) at pretest. At posttest, however, more co-teaching dyads in the treatment group used co-teaching methods other than *one teach/one support* than their counterparts in the control group.

Table 6. Pretest-Posttest Comparison of Co-Teaching Methods for Treatment and Control Groups, as Measured by PACT, Item 8

Parity	Treatment (n = 12)		Control (n = 12)	
	Pretest	Posttest	Pretest	Posttest
Co-Teaching Methods				
1) 1 Teach/1 Support for all instruction	9 (75%)	5 (41.7%)	9 (75%)	11 (91.7%)
2) 1 Teach/1 Support methods for the majority of instruction	2 (16.7%)	3 (25%)	3 (25%)	1 (8.3%)
3) Other than 1 Teach/1 Support for most instruction; 1 teacher leads more often	1 (8.3%)	4 (33.3%)	0 (0.0%)	0 (0.0%)
4) Teachers utilize variety of methods and equally sharing lead and support roles	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Comparison of Collaborative Co-Teaching Practices

To determine the extent to which co-teachers worked collaboratively to effectuate co-teaching practices, the observed pre- and post-treatment dyad performance on five PACT items related to collaborative engagement, or parity, was examined for both treatment and control groups. The five items included: co-planning responsibility for students, management of classroom structures and routines, delivery of instruction, management of inappropriate behaviors and checking for student understanding. As shown in Table 7, the majority of teachers in both groups exhibited very low levels of parity at pretest, as measured by these items. At posttest, however, co-teaching dyads in the treatment group appeared to engage in behaviors that represented parity more frequently than their counterparts in the control group.

Discussion

Observation of Co-Teaching Performance

Information about the observed collaborative performance of co-teaching dyads in the five areas of co-teaching (co-planning, co-instruction, co-classroom management, co-behavior management, and co-assessment) was collected using the *Performance Assessment of Co-Teaching* (PACT) instrument. The effect of the training on co-teaching practices of the treatment group was measured by comparing treatment and control groups' total posttest scores on the PACT, controlling for pretest performance. Results showed that teachers who participated in professional development training on co-teaching had significantly higher posttest scores on the PACT than those who did not participate in training. From this outcome, it appears that the model of professional development training designed for this study was successful at improving the co-teaching performance of regular and special education teachers.

Table 7. Pretest-Posttest Comparison of Selected PACT Items on Four-Point Scale Relating to Parity for Treatment and Control Groups

Parity	Treatment (n = 12)		Control (n = 12)	
	Pretest	Posttest	Pretest	Posttest
Co-Planning Responsibility for Students				
1) Special educator takes responsibility for students with disabilities; regular educator responsible for rest of students	3 (25%)	0 (0.0%)	1 (8.3%)	1 (8.3%)
2) Teachers sometimes share responsibility for all students in classroom	5 (41.7%)	1 (8.3%)	8 (66.7%)	8 (66.7%)
3) Teachers share responsibility for all students in classroom most of the time	4 (33.3%)	7 (58.3%)	3 (25%)	1 (8.3%)
4) Teachers share equal responsibility for all students in class	0 (0.0%)	4 (33.3%)	0 (0.0%)	2 (16.7%)

Classroom Management

1) 1 Teacher manages classroom structures and routines	7 (58.3%)	0 (0.0%)	3 (25%)	3 (25%)
2) 1 Teacher manages classroom structures and routine; 2nd manages infrequently	3 (25%)	2 (16.7%)	9 (75.0%)	8 (66.7%)
3) Both teachers manage classroom, but 1 teacher does less frequently	2 (16.7%)	9 (75.0%)	0 (0.0%)	1 (8.3%)
4) Both teachers manage classroom structures and routines equally	0 (0.0%)	0 (0.0%)	0 (0.0%)	0 (0.0%)

Delivery of Instruction

1) 1 Teacher delivers all instruction	5 (41.7%)	0 (0.0%)	4 (33.3%)	3 (25%)
2) 1 Teacher delivers most of the instruction; 2nd instructs infrequently	5 (41.7%)	0 (0.0%)	6 (50.0%)	6 (50.0%)
3) Both teachers deliver instruction, but 1 teacher does less frequently	2 (16.7%)	11 (91.7%)	2 (16.7%)	3 (25%)
4) Both teachers equally participate in the delivery of instruction	0 (0.0%)	1 (8.3%)	0 (0.0%)	0 (0.0%)

The finding of a higher mean PACT score for those who received training also has implications for parity. According to Friend (2008), successful co-teaching relationships are founded on parity, or equality, in roles, responsibilities and instructional behaviors between co-teaching partners. When parity is absent, co-teaching, as understood in the education literature, is not taking place. Lack of parity in the co-teaching relationship generally relegates one teacher to the role of "helper" in the classroom (Murawski, 2006). Parity between co-teachers was measured on 13 of 15 items on the PACT by the extent to which teachers collaboratively shared responsibility in co-teaching practices in the classroom (e.g., plan and deliver instruction, manage classroom structures and routines, monitor and assess student understanding). Lower scores on these individual co-teaching items (1-2 points) indicated that one teacher was observed to perform/take lead role in the activity for all or most of the observation; higher scores (3-4 points) indicated that both teachers were observed to equally perform/take lead role in the activity for all or most of the observation.

Pre-treatment observations revealed little evidence of parity between co-teaching partners. For example, in the majority of dyad observations for both treatment and control groups, one teacher managed all or most classroom structures and routines (91.7%), provided all or most of the instruction in the classroom (83.3%), managed all or most inappropriate behaviors of students (58.3%), and monitored all or most student responses and work for understanding (66.7%). Additionally, at pretest, only 29.2% of co-teaching dyads in both groups shared co-planning responsibility for all students most of the time. These findings are consistent with findings from previous studies that have shown lack of parity among practicing co-teachers with little training in co-teaching (Keefe & Moore, 2004; Magiera et al.; 2005; Moin et al., 2009).

At posttest, the treatment group's PACT scores appeared to be consistently higher than those of their control group counterparts across all five areas of co-teaching. This strongly suggests that there was more evidence of collaborative engagement, or parity, in co-teaching practices among those who received training. For example, at post-treatment, co-teachers in the treatment group exhibited higher levels than co-teachers in the control group of sharing co-planning responsibility for all students in the classroom equally or most of the time (91.6% v. 25%, respectively), sharing classroom management of activities equally or most of the time (75% v. 8.3%), sharing in the delivery of instruction equally or most of the time (100% v. 25%), sharing in the management of inappropriate behaviors of students equally or most of the time (75% v. 16.7%), and sharing in monitoring for student understanding equally or most of the time (91.2% v. 41.7%).

In the pre-treatment phase the majority of co-teaching dyads—91.7% in the treatment group and 100% in the control group—were observed by the researcher to rely on the *one teach/one support* co-teaching method (i.e., *one teach/one assist* and *one teach/one observe*) with whole group instruction for all or the majority of their instruction. These findings are consistent with previous studies that have shown co-teachers overuse whole group instruction and the *one teach/one assist* co-teaching method (Keefe & Moore, 2004; Magiera et al., 2005; Moin et al., 2009; Murawski, 2006). At posttest, 33% of the co-teaching dyads in the treatment group, compared to 0% in the control group, used co-teaching methods other than *one teach/one support* for most instruction.

Limitations of the Study

This study, conducted with the gracious cooperation of several school districts, was subject to several limitations, including the small number of participants. Participation in this study was dependent on at least four levels of cooperation—school districts, local school administrations, individual teachers and their co-teaching partners. Although the study began with 56 participants in 28 co-teaching dyads, four dyads that either were ineligible or made ineligible by changes in teaching assignments had to withdraw from the study. As a result, the power to detect significant differences between treatment and control groups in the study was lessened. Therefore, some caution should be used when interpreting the results of this study.

According to Rosenthal (1994), researchers can inadvertently influence the results of a study simply by having expectations about the outcomes of the study. There were two ways that the researcher attempted to reduce potential bias in observations. First, the researcher made every attempt to objectively rate the co-teaching performance of participant dyads. The researcher recorded data about co-teaching behaviors throughout the observation (e.g., how often each teacher took the lead role, what co-teaching methods were used) that were used to rate the co-teaching performance of dyads in the five areas of co-teaching. The second way the researcher attempted to reduce the potential for researcher bias was to enlist a second observer for 30% of the pretest observations and then compare differences in scores between the primary observer and the second observer, who had been trained to use the PACT observation form. High inter-rater agreement between the two observers suggests minimal bias on the part of the observer. However, this conclusion could have been made stronger had the second observer also participated in posttest observations.

A strength of the training program was its coherence as a "treatment package" that incorporated best practices in professional development. At the same time, this limited the ability to attribute effects to individual components of the training package.

Conclusions and Implications for Practice

Regular and special education teachers are largely unprepared for the co-teaching role, despite the great extent to which co-teaching has been adopted in public schools. The presence of co-taught classrooms is not a guarantee that the desired effects of co-teaching will be realized in the form of student outcomes. Therefore, ensuring that regular and special education teachers receive training in co-teaching best practices is an imperative for the field of education. The professional development model utilized in this study went beyond the traditional brief workshop to meet the best-practice standard of providing more training hours over a longer period of time—demonstrating that extended training for co-teaching can be successfully implemented within public school systems. This study also provides evidence that this model of training can improve the fidelity with which teachers employ co-teaching practices in co-taught classrooms. Improving the performance of co-teachers should result in better student outcomes.

The finding that teachers' co-teaching behaviors can change with effective professional development training should be a call to action to school administrators who are responsible for fostering growth among teachers and learning among students. However, school administrators may not have had the advantage of co-teaching training and therefore may not have a full understanding of and appreciation for what is necessary to support co-teachers. Providing training for administrators could create a school environment in which co-teaching is more fully understood, more deeply valued and more appropriately supported. For example, this study underscores the importance of ensuring co-planning time for co-teaching partners, which the participants reported was rarely available to them outside of this study. Without co-planning time, co-teachers are forced to act independently, which completely undermines the co-teaching model.

Beyond its application in this study, the *Performance Assessment for Co-Teachers* can be used to assess need for professional development training, and it also can support on-going evaluation to form more accurate observations of classroom performance as a basis for feedback and furthering collaboration between co-teaching partners.

Findings also have implications for the preparation of regular and special educators at the university level. First, preparation of pre-service teachers must include specific instruction in co-teaching if future teachers are to be prepared for a co-teaching role. Second, university faculty can play a lead role in the continuing education of practicing teachers through provision of professional development trainings, such as the one described in this study.

Future research could further refine this approach to training by replicating this study or examining potential enhancements, such as training provided by co-teachers, use of video-taping for reflective feedback, and training that takes place over a longer period of time.

References:

Allday, R. A., Neilsen-Gatti, S., & Hudson, T. M. (2013). Preparation for inclusion in teacher education pre-service curricula. *Teacher Education and Special Education, 36*(4), 298-311. doi:http://dx.doi.org/10.1177/0888406413497485

Birman, B. F., LeFloch, K. C., Klekotka, A. Ludwig, M., Taylor, J., Walters, K., Wayne, A., & Yoon, K.-S. (2007). State and local implementation of the No Child Left Behind Act: Vol. 2. Teacher quality under NCLB: Interim report. Washington, D.C.: U.S. Department of Education.

Bond, S. P. G. (2011). *Effects of a co-teaching teaming program on the instructional practices of high school general and special education teachers (Doctoral dissertation).* University of Maryland, College Park. ProQuest Dissertations and Thesis database. (UMI Number: 3461495)

Cook, L., & Friend, M. P. (1995). Co-teaching: Guidelines for creating effective practices. *Focus on Exceptional Children, 28*(8), 1-16.

Darling-Hammond, L., & McLaughlin, M. W. (1995). Policies that support professional development in an era of reform. *Phi Delta Kappan, 76*(8), 597-604.

Darling-Hammond, L., Wei, R. C., Andree, A., Richardson, N., & Orphanos, S. (2009). Professional learning in the learning profession: A status report on teacher development in the United States and Abroad. Dallas, TX: National Staff Development Council.

Fennick, E., & Liddy, D. (2001). Responsibilities and preparation for collaborative teaching: Co-teachers' perspectives. *Teacher Education and Special Education, 24*(3), 229-240.

Friend, M. (2008). Co-teaching: A simple solution that isn't simple after all. *Journal of Curriculum and Instruction, 2*(2), 9-19. doi.org/10.3776/joci.2008.v2n2p9-19

Garet, M. S., Porter, A. C., Desimone, L., Birman, B. F., & Yoon, K. S. (2001). What makes professional development effective? Results from a national sample of teachers. *American Educational Research Journal, 38*(4), 915-945. doi.org/10.3102/00028312038004915

Gately, S. E., & Frank J. Gately, J. (2001). Understanding coteaching components. *Teaching Exceptional Children, 33*(4), 40-47

Grskovic, J. A., & Trzcinka, S. M. (2011). Essential standards for preparing secondary content teachers to effectively teach students with mild disabilities in included settings. *American Secondary Education, 39*(2), 94-106.

Harris, K. R., Lane, K. L., Graham, S., Driscoll, S. A., Sandmel, K., Brindle, M., & Schatschneider, C. (2012). Practice-based professional development for self-regulated strategies development in writing: A randomized controlled study. *Journal of Teacher Education, 63*(2), 103-119. doi:10.1177/0022487111429005

Howard, L., & Potts, E. A. (2009). Using co-planning time: Strategies for a successful co-teaching marriage. *Teaching Exceptional Children Plus, 5*(4), 1-12.

Kahn, S., & Lewis, A. R. (2014). Survey on teaching science to K-12 students with disabilities: Teacher preparedness and attitudes. *Journal of Science Teacher Education, 25*, 885-910. doi:10.1007/s10972-014-9406-z

Keefe, E. B., & Moore, V. (2004). The challenge of co-teaching in inclusive classrooms at the high school level: What the teachers told us. *American Secondary Education*, 32(3), 77-88.

Kloo, A., & Zigmond, N. (2008). Coteaching revisited: Redrawing the blueprint. *Preventing School Failure*, 52(2), 12-20. doi:10.3200/PSFL.52.2.12-20

Magiera, K., Smith, C., Zigmond, N., & Gebauer, K. (2005). Benefits of co-teaching in secondary mathematics classes. *Teaching Exceptional Children, 37*(3), 20-24. doi: 10.1177/004005990503700303

Magiera, K., & Zigmond, N. (2005). Co-teaching in middle school classrooms under routine conditions: Does the instructional experience differ for students with disabilities in co-taught and solo-taught classes? *Learning Disabilities Research and Practice, 20*(2), 79-85. doi: 10.1111/j.1540-5826.2005.00123.x

McDuffie, K. A., Mastropieri, M. A., & Scruggs, T. E. (2009). Differential effects of peer tutoring in co-taught and non-co-taught classes: Results for content learning and student-teacher interactions. Exceptional Children, 75(4), 493-510. doi: 10.1177/001440290907500406

Moin, L. J., Magiera, K., & Zigmond, N. (2009). Instructional activities and group work in the U.S. inclusive high school co-taught science class. *International Journal of Science and Mathematics Education, 7*, 677-697. doi: 10.1007/s10763-008-9133-z

Murawski, W. W. (2006). Student outcomes in co-taught secondary English classes: How can we improve? *Reading and Writing Quarterly, 22*(3), 227-247. doi:10.1080/10573560500455703

Murawski, W. W. (2009). *Collaborative teaching in secondary schools: Making the co-teaching marriage work!* Thousand Oaks, CA: Corwin. doi: 10.4135/9781452219332

Murawski, W., & Swanson, H. (2001). A meta-analysis of co-teaching research: Where are the data? *Remedial and Special Education*, *22*(5), 258-267. doi: 10.1177/074193250102200501

Parsad, B., Lewis, L., & Farris, E. (2001). Teacher preparation and professional development: 2000. Washington, D.C.: U.S. Department of Education, National Center for Education Statistics.

Reinke, W. M., Stormont, M., Herman, K. C., Puri, R., & Goel, N. (2011). Supporting children's mental health in schools: Teacher perceptions of needs roles and barriers. *School Psychology Quarterly, 26*(1), 1-13. doi:10.1037/a0022714

Rivera, E. A., McMahon, S. D., & Keys, C. B. (2014). Collaborative teaching: School implementation and connections with outcomes among students with disabilities. *Journal of Prevention & Intervention in the Community, 42*(1), 72-85. doi: 10.1080/10852352.2014.855067

Rosenthal, R. (1994). Interpersonal expectancy effects: A 30-year perspective. *Current Directions in Psychological Science, 3*(6), 176-179.

Rosenzweig, K. (2009). *Are today's general education teachers prepared to meet the needs of their inclusive students?* Paper presented at the Northeast Educational Research Association (NERA) Annual Conference, University of Connecticut, Storrs, CT.

Ross, J. A., & Bruce, C. D. (2007). Professional development effects on teacher efficacy: Results of a randomized field trial. *Journal of Educational Research, 101*(1), 50-60.

Salvia, J., Ysseldyke, J. E., & Bolt, S. (2013). *Assessment in special and inclusive education*. Belmont, CA: Wadsworth.

Sankar, L. (2009). *An experimental study comparing the effectiveness of two formats of professional learning on teacher knowledge and confidence in a co-teaching class (Doctoral Dissertation).* University of West Georgia. ProQuest Dissertations & Theses database. (UMI Number: 3376877)

Shippen, M. E., Flores, M. M., Crites, S. A., Patterson, D., Ramsey, M. L., Houchins, D. E., & Jolivette, K. (2011). Classroom structure and teacher efficacy in serving students with disabilities: Differences in elementary and secondary teachers. *International Journal of Special Education, 26*(3), 36-44.

Snow-Renner, R., & Lauer, P. A. (2005). McREL insights: Professional development analysis. Denver, CO: Mid-continent Research for Education and Learning.

Spencer, S. S., & Logan, K. R. (2003). Bridging the gap: A school-based staff development model that bridges the gap from research to practice. *Teacher Education and Special Education, 26*(1), 51-62. doi: 10.1177/088840640302600106

Stormont, M., Thomas, C. N., & VanGarderen, D. (2012). Introduction to the special issue: Building capacity to improve student outcomes through collaboration: Current issues and innovative approaches. *Psychology in the Schools, 49*(5), 399-401. doi: 10.1002/pits.21605

U.S. Department of Education, & National Center for Education Statistics. (2016). *The condition of education 2016*. Washington, D.C.: Retrieved from http://nces.ed.gov/programs/coe/indicator_cgg.asp

Vitelli, E. M. (2015). Universal design for learning: Are we teaching it to preservice general education teachers? *Journal of Special Education Technology, 30*(3), 166-178. doi: 10.1177/0162643415618931

Wei, R. C., Darling-Hammond, L., Andree, A., Richardson, N., & Orphanos, S. (2009). Professional learning in the learning profession: A status report on teacher on teacher development in the U.S. and abroad: Technical Report. Dallas, TX: National Staff Development Council.

Weiss, I., Banilower, E. R., Overstreet, C. M., & Soar, E. H. (2002). Local systematic change through teacher enhancement: Year seven cross-site report. Chapel Hill, NC: Horizon Research, Inc.

Wong, H., Wong, R., Rogers, K., & Brooks, A. (2012). Managing your classroom for success. *Science and Children, 49*(9), 60-64.

Yoon, K. S., Duncan, T., Lee, S. W.-Y., Scarloss, B., & Shapely, K. L. (2007). Reviewing the evidence on how teacher professional development affects student achievement. Washington, D.C.: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance, Regional Educational Laboratory Southwest.

Access Education: What is Needed to Have Accessible Higher Education for Students with Disabilities in Jordan?

Gheed Mufied Alsalem,
Counseling and Special Education Department, The University of Jordan,
Amman 11942,
Jordan

Iyad Abu Doush,
Computer Science Department,
Yarmouk University, Irbid 21163,
Jordan
Computer Sciences and Information Systems,
American University of Kuwait,
Salmiya,
Kuwait
(idoush@auk.edu.kw)

Abstract
The number of students with disabilities attending universities is increased, and several challenges face them in higher education institutions. This study aims to determine accessibility needs of computer laboratories, libraries and websites for students with disabilities at Jordanian universities and colleges. The sample consists of staff in computer laboratories and libraries, web developers and e-learning staff to identify environmental and technological barriers from their perspective, as well as, to check their knowledge about assistive technology (AT) and issues related to accessibility. Questionnaires and expert review methods are used to test accessibility of websites in the investigated universities and colleges. Results indicated that current status of accessibility does not meet the expectations of equal access nor the needs of students with disabilities where there is shortages of ATs in computer labs and libraries, lack of awareness and insufficient training for the universities' staff and web developers related to accessibility issues, and all the evaluated universities web sites are inaccessible. Implications that should be contemplated by policy makers are highlighted and other recommendations are explored.

Keywords: Environmental barriers; Technological barriers; Web accessibility; Accessibility of universities services; Laboratories and libraries accessibility evaluation

Introduction

Completing a university or a college degree is important for students with disabilities (Fichten, Asuncion, Barile, Généreux, Fossey, Judd, Robillard, De Simone, & Wells, 2001). In their literature review, Fullarton and Duquette (2016) cited several reasons that encourage students with disabilities to finish their postsecondary studies. That is; "to achieve a personal goal, prove their worth, meet family and peer expectations, …enhance success in the workplace, and obtain financial security employment can bring" (p. 55). Consequently, there is an increasing number of them enrolled in postsecondary/ higher education institutions these days (Getzel, 2008; Heiman, Fichten, Olenik-Shemesh, Keshet, & Jorgensen, 2017). However, challenges faces students with disabilities is increased when attending higher education institutions (Webster, 2004). A person with disability may face three types of barriers: environmental, attitudinal, and technical. *Environmental barriers* are barriers that environmentally limit persons with disabilities from accessing and using public facilities. *Attitudinal barrier* means discriminating a person with disability through people's attitude, ideas, and assumptions (e.g., assuming a person with communication disorder cannot understand you). *Electronic or technical barrier* happened when a technology cannot be reformed into another format accessible by assistive devices (Whiteneck, Harrison-Felix, Mellick, Brooks, Charlifue, & Gerhart, 2004). Even though law enforce eliminating such barriers, some universities are physically inaccessible (Gilson, 2010), programmatically (Gilson, Dymond, Chadsey, & Hsu, 2007), and/or attitudinally (Gilson & Dymond, 2011). For example, in their study, Gilson and Dymond (2012) investigated barriers encountered by people with disabilities in Hong Kong University and investigate the effect of these barriers. The study evaluated different departments' services, student-instructor interaction, and environmental implication. Results revealed several barriers encounter students with disabilities when enrolling the university within these aspects.

In 2006, The United Nations Convention on the Rights of Disabled Persons established a commitment from the governments to give people with disabilities equal rights to access different facilities provided to the society. In Jordan, the Jordanian government amended the legislation twice; in 2007 and 2017 on the Rights of Persons with Disabilities (No. 31/2007) and (No. 20/ 2017) respectively, that was enacted in 1993 for the Welfare of Disabled People (No. 12/1993). Such law will allow people with disabilities to have equal opportunities in the society. The law indicated that one of the main responsibilities of the Ministry of Higher Education (MHE) and its educational institutions is "to provide reasonable accommodation arrangements, facilitating format, and accessibility to ensure that persons with disabilities are included in the available specialization" (No. 20/2017, Article 21-2). Thus, people with disabilities need to have an opportunity to fully participate in all aspects of activities at a university or a college inside and outside classrooms which allow them to participate effectively as students (Sach & Schreuer, 2011). This implies an ability to access information in classrooms and to access electronic resources through higher education institutions' websites. In addition, to access on-campus facilities including computer laboratories and libraries.

For people with disabilities, to access physical and social environment depends on the availability and use of AT (Carlson & Ehrlich, 2005). As well, for many of them to use computers and access electronic materials, they need adaptations that includes both hardware and software (Fichten, Asuncion, Robillard, Fossey, & Barile, 2003). This applies to accessing online information through web pages via assistive technologies to help individuals with disabilities (Hackett & Parmanto, 2005). Despite the above, Al-Hmouz (2014) identify obstacles in the higher education system facing students with disabilities in one public Jordanian university. The study point-out that students with disabilities do not have all necessary resources which help them meet their study needs. In addition, assistive devices are not available and most of the students with disabilities indicate that inadequate learning and assessment accommodations are provided to them.

In order for programs and activities in colleges and universities to be fully accessible to students with disabilities, colleges and universities are "specifically required to make reasonable modifications in their practices, policies and procedures, and to provide auxiliary aids and services for persons with disabilities" ("Rights of Students with Disabilities in Higher Education", 2013, p. 10). This is indicated under Section 504 of the Rehabilitation Act and the Americans with Disabilities Act, and implies the usability of buildings, as well as, learning materials and online environments by people with disabilities (Parks, n.d.). Gibson (2006) mention that the best location for adaptive technology is often in a room in a library or be a part of computer labs or in an independent building. According to Burgstahler (2012a, 2012b), using features and principles of universal design when preparing computer labs and libraries will make the need for special accommodation in the minimum level. Also, everyone feels welcome and comfortable to communicate, to move around, to access both printed and electronic materials and sources, and to use different hardware and software.

This paper preliminary investigated accessibility of computer laboratories, libraries, and websites to students with disabilities in Jordanian universities and colleges. The study surveyed awareness and preparation of workers in computer labs and library for accessible technologies and investigate on site the environmental barriers, as well as, awareness and preparation of web developer and e-learning staff for general and technical web accessibility guidelines. It explore related barriers in these settings from participants' perspectives. Finally, it checked accessibility of websites in these institutions.

For relevant work to this study that was reviewed, results of a recent research indicate quite low levels of services of library patrons, human resources, public relations, information sources, tools and equipment and new technologies, and library building for people with visual disability in Jordan in light of international standards (Al-Zboon & Hadidi, 2013). In accordance to Ekwelem (2013), findings of the study shows that most of students with visual impairment and mobility challenge in 9 federal and state universities in south-east Nigeria perceived "that libraries were established to serve only non-disabled users and that there is inadequate knowledge of the need of those who do not or cannot use the library" (p. 3). According to Fichten et al. (2003), participants of study 1 were 156 Canadian postsecondary personnel responsible for providing services to students with disabilities, and they represent 91 community/junior colleges and 55 universities.

Generally, results of their investigation show that participants' knowledge about adaptive computer technologies were limited.

In this context, accessibility to higher education would be incomplete without considering related websites accessibility. According to Henry (2006), having accessible web provides people with disabilities with unprecedented opportunities to both access information and interaction. Web accessibility has been a concern in many research studies. Relevant research studies investigate different topics such as: methods to be conducted to evaluate web accessibility (Hackett & Parmanto, 2005; Hackett & Parmanto, 2009; Henry & Grossnickle, 2004; Ivory & Hearst, 2001; Thompson, Burgstahler, & Comden, 2003; Yesilada, Brajnik, & Harper, 2009), web usability challenges (Abuaddous, Jail, & Basir, 2016; Curran, Walters, & Robinson, 2007; Lazar, Allen, Kleinman & Malarkey, 2007; Menzi-Cetin, Alemdag, Tuzun, & Yıldız, 2017), features are needed to be included in the web contents in order to consider them accessible (Becker, 2004; Carter, 2004, Chisholm, Vanderheiden, & Jacobs, 2001; Hanson, 2001), ways to improve web usability for elderly people and people with disabilities (Johnson & Kent, 2007), evaluating accessibility of important institutions' websites in different sectors (Goette, Collier, & White, 2006; Hackett & Parmanto, 2005, Hong, Katerattankul, & Joo, 2008; Ismail & Kuppusamy, 2018; Jennifer & Cowley, 2005; Kuzma, Dorothy, & Oestreicher, 2009; Thompson et al., 2003) and awareness of web developers with accessibility related issues (Freire, Russo, & Fortes, 2008).

Significance of the study
In order to determine what is needed to have accessible higher education for students with disabilities, we need to know what we actually have. The primary aim of the study is to provide information about the accessibility of libraries, computer labs, as well as, web developer and e-learning staff's awareness of accessibility barriers. These information will be a base for recommendations to be considered by decision makers when set up polices and critical decisions to be implemented. It is a way to provide better, more quality, and accessible services for students with disabilities.

Focusing on improving the accessibility of computer labs and libraries is important. Heaven's (2004) stated that "library and information services lie at the heart of learning at every higher education institution and have both moral and legal obligations to ensure equitable access to both the building and its resources for all users" (p. 24). Furthermore, Whitaker's (n.d.) report mentioned that computer labs are a critical resource that nearly every student need to have access to at some point during college. In addition, many courses of different programs in Jordanian higher education institutions perform computerized exams where students should be available on a certain time in a computer lab to be able to have the online test.

Websites accessibility indulge more importance due to "the increase of online instructional materials [that] presents new opportunities -and possible barriers- for accessibility in higher education" (Lewis, Yoder, Riley, So, & Yusufali, 2007). In line with this context, here in Jordan, initiatives to blend online approach to education have been started in several higher education institutions. So, it is time to check how accessible our higher education institutions are for people with disabilities.

Gathering data for a part of this study was through computer labs and libraries' staff who are in administrative positions and who are directly in contact with students in these facilities. For students with disabilities, it is important to interact with library staff who have knowledge and awareness of the needs of different kinds of disabilities to support them (Heaven, 2004). In his turn, Carter (2004) indicated the need and importance for students with disabilities to interact with library staff who are sensitive and understanding to their needs and who are aware of accessible information, services, and available equipment which would insure equitable access. Rationally, this is applied for computer lab staff, too. For the other part of the study, data was gathered from web developer and e-learning staff as their awareness and preparation for web accessibility guidelines is one of the main challenges cited in the literature to develop accessible web sites (Abuaddous et al., 2016).

Methods
Participants and Settings
To understand the accessibility of computer laboratories, libraries, and websites for students with disabilities in Jordanian universities and colleges, this study took place at five higher educational institutions: Al Albayt University, The Hashemite University, Alzarqa University, Almafraq College, and Cortoba College. These five Jordanian universities and colleges were selected to be in areas of Jordan outside the capital, Amman, and to cover the case of accessibility in other cities.

A total of 31 subjects participated in the study from these institutions. They were distributed into three categories. Two of these categories (Twenty-four) were personnel responsible for providing services to students in computer labs and libraries whereas eighteen (7 females and 11 males) were computer labs staff, and six (4 females and 2 males) were library staff. The third category composed of 6 participants (1 female and 5 males) and they were web developers and e-learning staff.

Instrumentation, Implementation and Data Analysis
Three sets of questionnaires were developed to collect information from the three categories of participants. These questionnaires composed of several parts: one part was to collect demographic information, other parts were to evaluate environmental and technological barriers, respectively, in computer labs and libraries. Another part of the questionnaires was used to evaluate the staff awareness and technical skills in computer labs and libraries of accessible environment and AT needed by students with disabilities in these settings.

Items of these parts were mostly Yes/ No questions and addressed the kind of services and the common tasks or requirements needed by students with disabilities in these settings. These items were borrowed from related literature (Burgstahler 2012; Doush, 2010; Doush, Mohammed, Ali, & Al-Betar, 2013; Hilton-Chalfen, Neville, Griesel, & Cooper, 1993; Kann, 1999; Leung, Owens, Lamb, Smith, Shaw, & Hauff, 1999; Miller & Sammons, 1999; Whiteneck, Harrison-Felix, Mellick, Brooks, Charlifue, & Gerhart, 2004).

For the set of questionnaires targeted to web developers' there was a part about their awareness of and/or preparation for implementing the web accessibility guidelines. This is based on the Web Content Accessibility Guidelines (WCAG) 2.0 level A and a set of rules extracted from section 508 of the Rehabilitation Act. Section 508 is a legislation regarding equal accessibility to electronic and information technology for people with disabilities (Government-wide Section 508 Accessibility Program, n.d.).

Open-ended questions were included in the part about participants' awareness and their technical skills of accessibility related to students with disabilities. These were in order to highlight actual services that are provided by their institutions as they perceived them, as well as, to list related hindrances from their perspectives which might represent a need for a considerable change and focused insights towards accessible higher education.

For the implementation process, onsite visits were done during the summer semester of the academic year of 2015/2016 for the five participated higher educational institutions to collect the data of this study. This helped taking a close look at services provided for students with disabilities in these institutions. Questionnaires were handed to the participants who signed consent forms that provided brief information of the importance of the study and its purposes. After responding; these questionnaires were directly collected.

For websites of these institutions, homepages were evaluated by an expert through responding to a checklist addressed several basic items of web accessibility barriers. An expert review method means that one or more experts look for accessibility problems in the website. An expert walkthrough evaluation was followed, in which the expert tests the homepages by performing several tasks that are familiar for users and identify any accessibility problems (Lazar, 2006). The expert who evaluated the web pages for this study had good experience with web accessibility barriers, as well as, his evaluation was based on the WCAG 2.0 level A, section 508 of accessibility standards, the problems encountered when completing the tasks using JAWS screen reader and investigating elements using Firefox accessibility plugin.

Regarding data analysis, Statistical Package for the Social Sciences (SPSS-16.0) was used to provide basic descriptive statistics for the data.

Results
For the part of responses related to environmental and technological barriers in both computer labs and libraries, averages of responses ranging from (0.00-0.33) indicate high barriers; averages of responses ranging from (0.34-0.66) indicate mid barriers; and averages of responses ranging from (0.67-1.00) indicate low barriers.

Table 1 shows the availability of some facilities that help students with disabilities to reach to computer laboratories and libraries in their institutions and the resources available by them. Although over all means in both computer labs and libraries indicate moderate barriers, it appears that the most environmental barriers are the unmarked equipment with accessible labels, unavailability of visible audio warning signals and unlabeled computers with accessible features. Disappointingly, most elevators are not accessible for students

with disabilities. That is, averages of responses in computer labs and libraries are 0.17 and 0.29; respectively, that indicate elevators have no auditory and visual signals for floors.

Thankfully, the availability of ramps in buildings entrances show the lowest environmental barrier in both computer labs and libraries with averages of 0.78 and 0.86, respectively. The availability of tables with appropriate heights for several use in both computer labs and libraries doesn't appear to be a barrier, too, with averages of 0.67 and 0.83, respectively.

Table 1. Environmental barriers in computer labs and libraries

Environmental barrier	Computer labs Means	Libraries Means
Are pathways and entrances to the building have ramps as alternative for a person on a wheelchair?	0.78	0.86
Are aisles kept wide and clear for wheelchair users?	0.44	0.86
Have stick out objects been removed or minimized for the safety of people with motor or visual impairment?	0.50	0.86
Are ramps and/or elevators provided as alternatives to stairs?	0.33	0.57
Do elevators have both auditory and visual signals for floors?	0.17	0.29
Are elevator controls marked in large print and Braille or raised notation?	0.22	0.43
Can people seated in wheelchairs easily reach all elevator controls?	0.28	0.43
Are equipment's (e.g., printers or scanners) in the library or the computer lab marked with large print and Braille labels?	0.06	0.14
Are high contrast signs, Braille labels, large prints used in the library and in the lab?	0.56	0.57
Are computers with accessible features labeled clearly?	0.17	0.14
Are audio warning signals available visually?	0.06	0.14
Are safety alarms, telephones and room controls (lighting, heat, air conditioning, windows, window shades) within the reach for a person with a disability?	0.33	0.43
Are printed materials, computers and other services within the reach from a variety of heights, so wheelchair users and little people can access?	0.39	0.57
Are service desks wheelchair accessible (i.e., the tops of accessible tables and counters shall be from 710 mm to 865 mm above the finish floor or ground)?	0.33	0.43
Are there tables in libraries high enough so that students who use wheelchairs can fit under them?	N/A	0.83
Are private study rooms, or study carrels available for people with disabilities who need to use personal equipment, or who need the assistance of a reader, or who are distracted by noise and movement around them?	N/A	0.67
Is there at least one adjustable computer table accessible to users of wheelchairs or crutches? The height of desks, at least one for each workstation type: between 29 and 33 inches (73.7 cm - 83.8 cm) varies with individual wheelchairs	0.67	N/A
A total average	0.35	0.51

For technological barriers in computer labs, Table 2 provides examples of equipment or assistive technologies that are needed for students with disabilities to be able to use

computers and/ or access information. As shown in this table, most averages of responses indicate high barriers. For example, the unavailability of special devices for students with disabilities (e.g., keyboards with large prints, Braille labels and home-row key indicators).

Table 2. Technological barriers in computer laboratories

Technological barriers	Means
Are wrist rests available for those who require extra wrist support while typing?	0.06
Are keyboards with large prints, Braille labels and home-row key indicators available?	0.00
Are screen readers (e.g., JAWS and NVDA), screen enlargement software (e.g., Zoom text), and voice recognition software (e.g., Dragon Naturally Speaking) available?	0.12
Are large monitors available (i.e., 21" or larger monitor)?	0.29
Are headphones and volume adjustment available on the computers?	0.12
Are the documents available in alternative formats (i.e., Braille, audio, large text, and electronic)?	0.06
Are keyboard guards available to assist those who have limited fine motor skills?	0.06
Are alternative keyboards, mini-keyboards, or extended keyboards available for users with mobility impairments?	0.06
A total average	0.10

For technological barriers in libraries, results in Table 3 provide examples of AT devices and services that are needed by students with disabilities to be able to access information. As shown in the table, some devices that benefit only people with disabilities are not presented in the library at all. For example, average responses for the availability of magnifiers for people with visual impairment, as well as, the presence of communication devices for people who are deaf are 0.00. Also, average responses point out high obstacles related to unavailability of sign language translation service; unavailability of large print and Braille versions of library handouts and guides; non-provision of both shelf and stack identifiers and call numbers on book spines in either large print or Braille formats; and unavailability of computers with accessible features (i.e., with screen reader and screen magnifier software). However, it seems that the availability of some services and special devices is moderate; such as electronic mail and phone services for borrowing and reserving books and other references, closed-circuit televisions CCTV to enlarge printed resources, and alternative formats for some documents and references (e.g., Braille, large print, audio and electronic text).

Table 3. Technological barriers in libraries

Technological barriers	Means
Are computers with accessible features (i.e., with screen reader and screen magnifier software) available?	0.14
Are shelf and stack identifiers provided in large print and Braille formats?	0.17
Are call numbers on book spines printed in large type?	0.17
Are telecommunication devices for the deaf (TTY/TDD) available? Tele Typewriter– a device that uses text instead of voice to communicate via telephone lines	0.00

Are borrowing and reserving books and other references services available by phone, and electronic mail?	0.50
Are closed-circuit televisions CCTV available to enlarge printed documentation?	0.50
Are large print and Braille versions of library handouts and guides available?	0.17
Are Talking Book and Braille books available for persons who are blind or who have low vision or mobility impairments?	0.33
Are readers and research assistants' services available to persons with vision impairments?	0.33
Are sign-language interpretation services available by request for library sponsored events?	0.17
Are magnifiers available in the library to help students with low vision reading the books?	0.00
Are documentation provided in alternative formats accessible to people who have low vision and people with visual disability (e.g. Braille, large print, audio and electronic text)?	0.43
A total average	0.24

Averages of responses is used to indicate staffs' awareness and their technical skill on using assistive technologies and accessible environment. Averages of responses range from (0.00-0.33) indicate low level of awareness; averages of responses ranging from (0.34-0.66) indicate mid-level; and averages of responses ranging from (0.67-1.00) indicate high level.

Accordingly, results in Table 4 show that averages of responses in both libraries and computer labs indicate low levels for the majority of the listed items. That is, for most of the participants, they have not received training in both adaptive computer technology and policies and procedures for providing help for persons with disabilities. Also, most of them don't know about the procedures they may follow in order to ensure quick responses to request adaptive technology that are not currently available. Moreover, they are not notified about any staff member who uses sign language, if available, to assist students who are deaf. However, average responses on familiarity with accessible technology and accessible environmental settings indicate moderate levels with averages of 0.43 and 0.50, for library staff and computer lab staff respectively.

Table 4. Awareness and preparation of participants in libraries and computer labs for assistive technologies and accessible environment

	Library Staff	Computer Labs
Awareness and preparation of assistive technology and accessible environment	**Means**	**Means**
Are you familiar with accessible technology and accessible environmental settings?	0.43	0.50
Have you trained in the use of adaptive computer technology?	0.14	0.11
Have you trained in policies and procedures for providing help to persons with disabilities?	0.14	0.17
Do public services staff wear large print name badges?	0.43	0.28
If any staff members are trained in sign language, are they identified to other staff members so that, when available, they can assist people who are deaf?	0.14	0.11
Do you know the procedure to ensure quick responses to request adaptive technology that you do not currently have available?	0.14	0.00
A total average	0.24	0.20

Regarding responses to the open-ended question related to the kind of services offered by respondents' institutions to students with disabilities, Table 5 provides a list of specific services available. It seems that there is an agreement among librarians and computer lab staff on the presence of the basic environmental facilitations for accessibility. However, for computer lab staff, specific statements by some participants reveals that they are not aware of the presence of students with disabilities enrolled in their institutions.

Table 5: Services offered by participants' institutions to students with disabilities

Providing entrances for wheelchairs
Availability of private rooms and books in Braille format
Reading for students with visual impairment using voice recording   } Library staff
Services for borrowing and reserving books and other references

The presence of elevators
Changing the place of the hall to the first floor instead of the upper floors
There is no students with disabilities attend the institution, so, no need to have such services   } Computer lab staff
Providing ramps for wheelchairs

Results in table 6, indicate that web developers and e-learning staff have moderate level of awareness regarding specific technical features to be available in accessible web sites. Most responses to the items listed in the table indicate moderate or high level of awareness except for completion of online forms which seems that respondents are not aware that these should be designed to allow users of assistive technologies to access the information and field elements easily with an average responses of 0.17.

The specific technical features with highest awareness level are: all non-text Content have appropriate, equivalent alternative text; keyboard equivalent is provided for all actions; and a link is provided for the user to skip the navigation bar.

Table 6. Web developers and e-learning staff's awareness of specific technical features to be available in web sites

Technical features	Means
Are all electronic forms that are designed to be completed online allow users with assistive technologies to access information, field elements, and functionality required for completion and submission of the forms include directions and cues for use?	0.17
Color is not used as the sole method of conveying content or distinguishing visual elements.	0.50
Keyboard equivalent is provided for all actions accomplished using only the mouse.	0.67
All non-text Content (e.g., images or buttons) have appropriate, equivalent alternative text.	0.67
A link is provided for the user to skip the navigation bar (and other page elements that are repeated across web pages) and allow the user to enter directly to the main body of the webpage?	0.83
The web pages have a descriptive and informative page title.	1.00
A total average	0.64

Table 7 show results for awareness of and/or readiness for implementing general and technical web accessibility guidelines by web developers and e-learning staff. The total

average indicates low level. It seems that most of participants are not familiar with web accessibility guidelines with an average response of 0.33. When they were asked to mention the sources they rely on when developing their institutions' websites to be accessible, only 33% of them mentioned WAI and W3C as the main source (See table 8). On one hand, most of them are unaware if their institutions apply web accessibility guidelines and standards, as well as, they do not check the accessibility of their websites for persons with disabilities with average responses of 0.17 for each.

Table 7. Averages of awareness of, preparation for application of web accessibility guidelines by web developers and e-learning staff

Are you familiar with web accessibility guidelines?	0.33
Are accessibility guidelines and standards are applied on your institution's website (i.e., student services, instructional material, administrative information, and information for the general public, library)?	0.17
Do you check the accessibility of your institution's website for persons with disabilities?	0.17
Have you trained in the use of adaptive computer technology?	0.00
Have you trained in policies and procedures for providing help to persons with disabilities?	0.50
Do you know the procedure to ensure quick responses to any complaints regarding web site accessibility for students with disabilities?	0.33
A total average	0.25

Table 8. Accessibility guidelines sources

Source	Percentage
Internet documents	17%
WAI and W3C	33%
Jordan Higher council for persons with disabilities	17%
No answer (I don't know)	33%

Table 9 provides list of responses to the open-ended question related to hindrances of the absence of AT (hardware or software) in both libraries and computer labs, as well as hindrances for not developing accessible websites. All responses were reviewed for the three categories and briefly listed in outlined points where each of them highlights a specific issue to be considered in the discussion and recommendations of this paper.

Table 9: Probable factors that imped providing of AT or developing accessible websites

• No awareness of the availability of such technologies/
  Lack of knowledge about such hardware and software
• There is no students with disabilities come to the library   Library staff
• Financial matters

• No willing from the higher management/
  Lack of desire by the administration
• There is no interest in such technologies   Computer lab staff
• Financial matters
• lack of legislation

• It is not a priority for the institution
• There is no students with disabilities use the website/
  No complaints about the website accessibility for people with disabilities   Web developers and e-learning staff
• Financial matters
• No enforcement of the law

Regarding web sites' review of the institutions, an expert evaluated homepages (see table 10) through responding to a checklist addressed several web accessibility barriers. Results are listed in table 11 and they show that the three universities have accessibility barriers in most of the tested items whereas the two colleges had better results. For example, in the case of number of tabs are needed to bypass menus and content to access the main content of the page and to start the task, the two colleges have no menus in the homepage. However, one of the main accessibility problems that is found in all websites of targeted institutions is that there is no skip navigation link on any of them.

Table 10. Universities and Colleges web sites

Institution Name	Website
Almafraq College	http://jormulti.blogspot.com/2012/01/blog–post_04.html
Cortoba College	http://www.cordoba–edu.com/
The Hashemite University	http://www.hu.edu.jo/
Alzarqa University	/http://www.zu.edu.jo
Al Albayt University	http://www.aabu.edu.jo/

Table 11. Accessibility problems found by the expert in the homepage

	Tested element	Almafraq College	Cortoba College	Al Albayt University	Alzarqa University	The Hashemite University
1	Homepage has a descriptive and informative page title	No	Yes	Yes	Yes	No

2	Homepage links have a descriptive names	Yes	Yes	Some image links do not have a descriptive text	Some image links do not have a descriptive text	Some image links do not have a descriptive text
3	Number of tabs to reach the homepage main content	2	3	34	27	36
4	Are there elements in the webpage that cannot be accessed using the keyboard	No	No	Yes, the sub-menus and tabbed form can be reached only using the mouse	Yes, the sub-menus can be reached only using the mouse	Yes, the sub-menus can be reached only using the mouse
5	Number of images with no alternative text	1	6	13	5	10
6	The availability of "skip to main contents" links	No	No	No	No	No
7	There is a content that is presented according to time which cannot be controlled	No	No	Yes, there is moving advertisements	No	No

Figure1 and Figure2 provide more examples of accessibility problems found in two of the evaluated universities
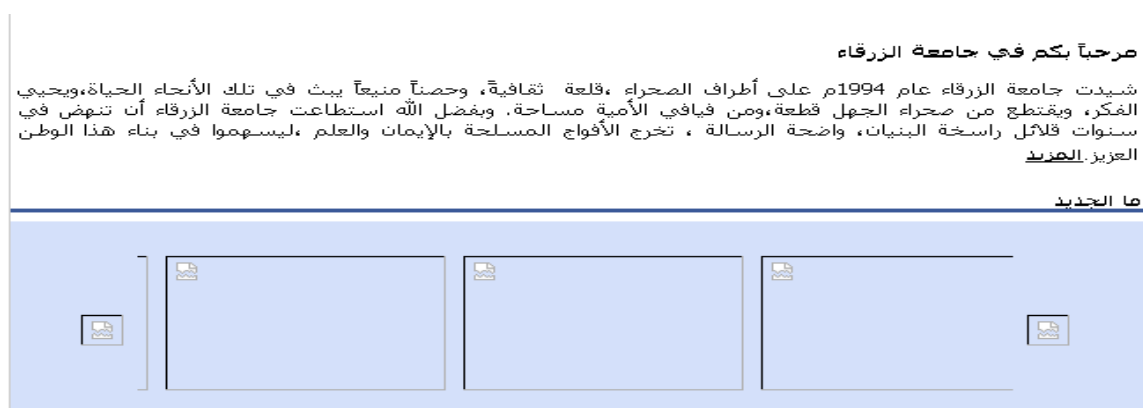

Figure 1. Homepage of Alzarqa University with no alternative text for images

Figure 2. Homepage of Al Albayt University with tabbed forms that cannot be accessed using the keyboard

Discussion

Having accessible higher education is imperative as number of students with disabilities is increased in these settings. Part of this accessibility is to access different facilities and services in related institutions including libraries, computer labs and websites. In this study, availability and needs to access these facilities and services were investigated through surveying awareness and preparation of staff working in these settings.

For environmental accessibility to, and inside, libraries and computer labs, the results imply that the investigated institutions have barely accessible features. Although total averages indicate moderate barriers; taking into account that it is a bit better in the libraries, averages for specific items indicate high barriers. This might be due to variety among different categories of disabilities and their uniqueness needs to specific modifications and features to reach the services in the building and navigate inside them. This consistent with Al-Zboon and Hadidi study (2013) that indicated low level of the availability of international standards in the domain of library building for people with visual disability in Jordan. As well, this agrees with statements of students with visual impairment and mobility challenges in Ekwelem study (2013) that establishment of libraries does not take into considerations needs of users with disabilities.

In related that the total average in libraries is a bit better than in the computer labs, this might be related to that staff in computer labs are not aware of the presence of students with disabilities enrolled in their institutions; as was stated by some participants. This is clear when they were asked about services are provided by their institutions to students with disabilities where some of them mentioned the presence of elevators. They neglected the absence of special features in the elevators which restrict of being used independently by a wide range of students with disabilities although their responses regarding the environmental barriers indicated this issue. Moreover, there was no focus in their responses on services are provided to students with disabilities by the computer lab itself, where it is supposed that they are professionals in computer technologies hardware and software; rather that they mentioned services available in the institution generally that could be noticed by anyone. This implies they are not aware of or understand specific needs to students with disabilities in these settings.

Regarding technological accessibility in both libraries and computer labs, it is obvious from the results the vulnerability of accessibility with total averages that indicate high barriers. Again, this consistent with Al-Zboon and Hadidi study (2013) that indicated very low level of the availability of international standards in the domains of tools, equipment and new technology and sources of information for people with visual disability in Jordanian libraries. Also, this agrees with findings of Al-Hmouz (2014) study related to unavailability of assistive devices and all necessary resources of learning for most of students with disabilities were attending one of public Jordanian universities, as well as, reasonable accommodations that are provided to them were inadequate. However, this inconsistent with what Fichten et al. (2003) found that in the investigated institutions

"computer technologies were up-to-date [and] there were adequate adapted computers in specialized labs".

According to participants, hindrances of the shortage of assistive technologies available for students with disabilities including hardware and software they need to access information might be due to several factors. These are: no interest or lack of awareness of the availability of such technologies and its advantages; it is not a priority for higher managements or there is not an urgent need for administrations to equip libraries and computer labs with such technologies given that small number of students with disabilities, if any, use these services; lack of financial resources available given the cost of provision such technologies; and absence of mandatory and in force laws and legislation. Several of these factors have been cited in the literature where they were counted as barriers or obstacles to provision of needed assistive technologies (Ekwelem, 2013; Gilson, & Dymond, 2012). However, according to Fichten and her colleagues (2003), there was agreement in the investigated institutions "that administration reacts positively concerning computer accessibility; and that outside agencies provide students with appropriate equipment".

Furthermore, part of the previous results might be justified through looking at responses to the last part of the questionnaire related to participants' awareness and preparation in these settings for assistive technologies and accessible environment which represents low levels. This agrees with Al-Zboon and Hadidi results (2013) of very low level of the availability of international standards in the domain of human resources in Jordanian libraries. Unfortunately, although it was reported that it is important for library staff, with whom students with disabilities interact, to be knowledgeable and aware of their disabilities and related needs (Heaven, 2004; Carter, 2004), results of this part of current study reveals that there are no indicators that administrations of universities and colleges provide training for the staff or give them information about available solutions for accessibility. As well, this points out that there is shortage of staff who are experienced with accessibility issues. It seems that this consistent with results of Fichten et al. (2003) that indicated agreement among the investigated institutions regarding inadequate "opportunities of employees to learn about specialized accessible computer technologies, availability of a specialist in adaptive hardware and software on campus [and] ability of computer support personnel to service computers with adaptive hardware or software".

In relation to the low level of awareness and readiness of participants for developing accessible web sites, according to the respondents, many reasons have contributed to this situation. These include: lack of awareness of the presence of users with disabilities as there were no complaints about web sites accessibility by them, weak planning and implementation, lack of organization support, insufficient training for staff and web developers, and most of all the absence of national accessibility guidelines and evaluation policy. This agrees with what was cited in Abuaddous and her colleagues (2016) where many of these previous reasons considered as challenges for developing accessible web sites. According to Henry (2006), in order for web sites to be accessible; understanding of the interdependencies between the technical components (web content, technical specifications, authoring tools, evaluation tools, user agents and ATs) and human components (tool developers, users and content developers) is needed.

Regarding accessibility problems found by the expert in the homepages, results show that the three universities have accessibility barriers in most of the tested items whereas the two colleges have better results. This might be due to that colleges have very simple home pages with no much information for students. This consistent with findings of Hackett and Parmanto (2005) that the more complicated higher education web sites the less accessible for students with disabilities.

Note that although the responses of web developers and e-learning staff indicate their moderate knowledge about specific technical features to be available in accessible web sites, the expert's review point out failure in all of these features in examined institutions' web sites. It seems that there is a gap between knowledge and application. This might be either due to the previous result of low level of awareness and readiness of participants for application of web accessibility guidelines, or due to the absence of understanding of the interdependencies between the technical components and human components of web sites as was indicated by Henry (2006).

Conclusions and Implications

This study address the current status of higher education accessibility by students with disabilities in Jordan. The results clearly illustrate the weaknesses of understanding and implementing accessible environment, technology and web sites in the majority of investigated Jordan higher education institutions. As well, results reveal lack of awareness and preparation for staff about students with disabilities, their uniqueness needs and services they need.

Although the government role is the most critical role in eliminating barriers faced by students with disabilities in higher education, other stakeholders such as; developers, private sectors and educational institutes have pivotal role, too, and complement the role of the government. Following are suggested policy implications that need to be considered.

Public Policy (Government)

First and foremost, national accessibility laws and guidelines have to be in place. Moreover, government needs to implement manuals and instructions that ensure implementing accessible environment, technology, and web sites of higher education institutions. A reconstruction plan is also needed to improve and enhance the accessibility of current higher educational institutions. This requires a strong commitment of Jordan MHE in implementing accessibility guidelines in universities and colleges to insure equitable access and equal opportunities to students with disabilities.

In addition, both MHE and Higher Council for the Rights of Persons with Disabilities (HCD) need to work closely to support these efforts, increase environmental and technological accessibility barriers awareness, planning national accessibility policies, and evaluating the successful implementation of accessibility policies by higher educational institutions in Jordan.

The government needs also to enforce applying the accessibility guidelines. It has to determine the minimum level of acceptable accessibility in all contracts when building computer laboratories, libraries or developing web sites in higher education institutions.

Educational Institutes
Schools, universities, and other teaching institutions need to cooperate with government and private/ public educational sectors to develop and improve services provided for students with disabilities. That is, to bridge the accessibility gap, higher education institutions are required to provide ATs in both computer laboratories and libraries and make them available for students with disabilities to be able to access information in the format they need. As well, they need to provide extensive and sufficient training for staff and developers to increase their awareness and knowledge of students with disabilities, their needs and related accessibility issues. Further, they need to encourage students with disabilities to navigate the web, use computer labs and libraries. This can be done by having announcements about services and facilities that are available for them, hold workshops and training related to the use of available ATs as needed.

Moreover, web accessibility needs to be part of programs and curriculum of computer science and information technology departments in the universities. This would help to increase awareness of web accessibility guidelines and how can they be applied when designing or developing web sites. This is kind of pre-service preparation programs for prospective web sites developers and computer lab staff.

Many of the constraints can be solved by merely having a desire to do so. Overcoming such constrains can be achieved if the educational institutions have support from government agencies and civil society organizations.

Web Developers and e-learning staff
Web developers and e-learning staff are key elements to web accessibility. Enlightening and educating current web developers on the importance of adopting and implementing web accessibility guidelines by offering those training courses on how these guidelines can be applied in practice will significantly improve the accessibility of their institutions web sites. Another issue to be highlighted is testing of the higher education institutions web sites. This should involve users with disabilities and it has to be performed as successive cycles.

Limitations and Future Research
It is worth to be mentioned that this research findings are limited to the time of data collection, the settings where the study was conducted and the sample from whom the data was collected. This should be taken into consideration for generalizability issues and when interpreting the results. Other studies can be carried out to present other parties' perspectives about available services, barriers and needs to better understand the current status and what to consider for future plans and decisions. This might include students with disabilities themselves from different categories, administrators and other stakeholders. Further, for the purposes of this study, it was appropriate to perform quick check of the accessibility of the homepages of higher education institutions; however, for future research, the authors suggest to evaluate the entire web sites accessibility of these institutions and not solely evaluating the homepages for more accurate results (Hackett & Parmanto, 2005).

References

Abuaddous, H.Y., Jail, Z. J., & Basir, N. (2016). Web accessibility Challenges. *International Journal of Advanced Computer Sciences and Applications, 7*(10), 172-181.

Al-Hmouz, H. (2014). Experiences of Students with Disabilities in a public University in Jordan. *International Journal of Special Education, 29*(1), 25-32.

Al-Zboon, E., & Hadidi, M. (2013). Evaluate the state of library services for persons with visual disabilities in Jordan in light of the International standards. *Jordan Journal of Educational Sciences, 9*(4), 377-388.

Becker, S. A. (2004). *A study of web usability for older adults seeking online health resources.* Paper presented at the ACM Transactions on Computer-Human Interaction (TOCHI).

Burgstahler, S. (2012a). *Equal Access: Universal Design of Computer Labs A checklist for making computer labs welcoming, accessible, and usable*. University of Washington. Retrieved July 2016, from http://www.washington.edu/doit/sites/default/files/atoms/files/EA_Labs_06_08_12.pdf

Burgstahler, S. (2012b). *Making Electronic Resources Accessible in Libraries: Ensuring equal access to all patrons.* University of Washington. Retrieved July 2016, from http://www.washington.edu/doit/sites/default/files/atoms/files/Making-Electronic-Resources-Accessible-Libraries.pdf

Carlson, D., & Ehrlich, N. (2005). *Assistive Technology and Information Technology Use and Need by Persons With Disabilities in the United States*. U.S. Department of Education, National Institute on Disability and Rehabilitation Research. Washington, D.C. Retrieved from http://www2.ed.gov/rschstat/research/pubs/at-use/at-use-2001.pdf

Carter, C. J. (2004). Providing services for students with disabilities in an academic library. *Education Libraries, 27*(2), 23-39.

Chisholm, W., Vanderheiden, G., & Jacobs, I. (2001). Web content accessibility guidelines 1.0. *Interactions, 8*(4), 35–44.

Curran, K., Walters, N., & Robinson, D. (2007). Investigating the problems faced by older adults and people with disabilities in online environments. *Behaviour & Information Technology, 26*(6), 447–453.

Craven, J., & Nietzio, A. (2007). A task-based approach to assessing the accessibility of web sites. *Performance Measurement and Metrics, 8*(2), 98-109.

Doush, I. A. (2010). *Software Assistive Technologies for the Blind and Visually Impaired: Guidelines for Building Accessible and Usable Interfaces, a Review of .* VDM Verlag Dr. Müller.

Doush, I. A., Mohammed, A. B., Ali, E., & Al-Betar, M. A. (2013). Towards a More Accessible E-government in Jordan: An evaluation Study of Visually Impaired Users and Web Developers. *Behaviour & Information Technology Journal, 32*(3), 273-293.

Ekwelem, V. O. (2013). Library services to disabled students in the digital era: Challenges for outcome assessment. *Library Philosophy and Practice* (e-journal), paper 970. http://digitalcommons.unl.edu/libphilprac/970

Fichten, C. S., Asuncion, J., Barile, M., Généreux, C., Fossey, M., Judd, D., Robillard, C., De Simone, C., & Wells, D. (2001). Technology integration for students with disabilities: Empirically based recommendations for faculty. *Educational Research and Evaluation, 7*(2-3), 185-221.

Fichten, C.S., Asuncion, J. V., Robillard, C., Fossey, M.E., & Barile, M. (2003). Accessible computer technologies for students with disabilities in Canadian higher education. *Canadian Journal of Learning and Technology, 29*(2). Retrieved August 2016, from http://www.cjlt.ca/index.php/cjlt/article/view/26549/19731

Freire, A. P., Russo, C. M., & Fortes, R. P. M. (2008). The perception of accessibility in Web development by academy, industry and government: a survey of the Brazilian scenario. *New Review of Hypermedia and Multimedia, 14*(2), 149-175.

Fullarton, S., & Duquette, C. (2016). Experiences of students with learning disabilities in Ontario universities: A case study. *International Journal of Special Education, 31*(1), 55-66.

Getzel, E. E. (2008). Addressing the persistence and retention of students with disabilities in higher education: Incorporating Key Strategies and Supports on Campus. *Exceptionality, 16*(4), 207-219.

Gibson, A. (2006). Disability Support Services, Victoria University of Wellington. In Hernon, p., & Calvert, P. (Eds.), *Improving the Quality of Library Services for Students with Disabilities.* Retrieved August 2016 from https://books.google.com.sa/books?id=I4if21Xi19IC&printsec=frontcover#v=onepage&q&f=false

Gilson, C. L. (2010). From compliance to proactive accessibility: How small institutions create success. *Annual meeting of the Association on Higher Education and Disability.* Denver, CO.

Gilson, C. L., Dymond, S. K., Chadsey, J. G., & Hsu, S. Y. (2007). Gaining access to textbooks for postsecondary students with visual impairments. *Journal of Postsecondary Education and Disability, 20*(1), 28-38.

Gilson, C., & Dymond, S. (2011). Constructions of disability at a university in Hong Kong: Perspectives of disabled students, staff members, and instructors. *Disability Studies Quarterly, 31*(2), 1-14.

Gilson, C. L., & Dymond, S. K. (2012). Barriers Impacting Students with Disabilities at a Hong Kong University. *Journal of Postsecondary Education and Disability, 25*(2), 103–118.

Goette, T., Collier, C., & White, J. D. (2006). An exploratory study of the accessibility of state government Websites. *Univ Access Inf Soc, 5*, 41–50.

GSA Government-wide Section 508 Accessibility Program. (n.d.). Section 508 Law and Related Laws and Policies. https://www.section508.gov/content/learn/laws-and-policies

Hackett, S., & Parmanto, B. (2005). A longitudinal evaluation of accessibility: Higher education web sites. *Internet Research, 15*(*3*), 281-294.

Hackett, S., & Parmanto, B. (2009). Homepage not enough when evaluating web site accessibility. *Internet Research, 19*(*1*), 78-87.

Hanson, V. L. (2001). *Institutional and web activities: web access for elderly citizens.* Paper presented at the Proceedings of the 2001 EC/NSF workshop on universal accessibility of ubiquitous computing: providing for the elderly.

Heaven, S. (2004). The provision made by higher education library services for people with disabilities. *Library & Information Research, 28*(90), 24-30.

Heiman, T., Fichten, C. S., Olenik-Shemesh, D., Keshet, N. S., & Jorgensen, M. (2017). Access and perceived ICT usability among students with disabilities attending higher education institutions. *Education and Information Technologies.* Advance online publication. doi: 10.1007/s10639-017-9623-0

Henry, S. L. (2006). Understanding web accessibility. *Web accessibility: Web standards and regulatory compliance.* Retrieved from http://uiaccess.com/understanding.html#refs

Henry, S., & Grossnickle, M. (2004). *Just Ask: Accessibility in the user-centered design process*. Retrieved from http://www.UIAccess.com/AccessUCD

Hilton-Chalfen, D., Neville, A., Griesel, C., & Cooper, B. (1993). Distributed Computer Access for People with Disabilities in a Post-Secondary Institution. *Proceedings of the CSUN Conference on Technology and persons with Disabilities.*

Hong, S., Katerattankul, P., & Joo, S. J. (2008). Evaluating government website accessibility: A comparative study. *International Journal of Information Technology & Decision Making, 7*(3), 491–515.

Ismail, A., & Kuppusamy, K.S. (2018). Accessibility of Indian universities' homepages: An exploratory study. Journal of King Saud University – Computer and Information Sciences, 30, 268–278.

Ivory, M., & Hearst, M. (2001). The state of the art in automating usability evaluation. *ACM Computer Survey, 33*(4), 450-516.

Jennifer, S., & Evans-Cowley. (2005). The Accessibility of Municipal Government Websites. *Journal of E-Government, 2*(2).

Johnson, R., & Kent, S. (2007). *Designing universal access: web-applications for the elderly and disabled. Cognition Technology and Work, 9*(4), 209-218.

Kann, C. H. (1999). *A Study to Identify Operational Computer Lab Models And to Develop an Instrument to Assist in Evaluating Programs That Provide Computer Technology.* West Virginia University: College of Human Resources and Education.

Kuzma, J., Dorothy, Y., & Oestreicher, K. (2009). *Global e-government Web Accessibility: An Empirical Examination of EU, Asian and African Sites.* Paper presented at the ICTA'09, Hammamet, Tunisia.

Lazar, J. (2006). *Web Usability: A user centered design approach*. Boston: Pearson.Lazar, J., Allen, A., Kleinman, J., & Malarkey, C. (2007). What frustrates screen reader users on the web: A study of 100 blind users. *International Journal of Human- computer Interaction, 22*(3), 247–269.

Leung, P., Owens, J., Lamb, G., Smith, K., Shaw, J., & Hauff, R. (1999). *Assistive Technology Meeting the technology needs of students with disabilities in post-secondary education.* Deakin University: Institute of Disability Studies.

Lewis, K., Yoder, D., Riley, So, Y., & Yusufali, S. (2007). Accessibility of web sites in higher   education. *Educause Quarterly, 30*(3), 29-35.

Mankoff, J., Fait, H., & Tran, T. (2005). *Is your web page accessible? A comparative study of methods for assessing web page accessibility for the blind.* Paper presented at the Human factors in computing systems (CHI), Portland, Oregon.

Menzi-Cetin, N., Alemdag, E., Tuzun, H., & Yıldız, M. (2017). Evaluation of a university website's usability for visually impaired students. *Universal Access in the Information Society*, *16*, 151–160

Miller, N. B., & Sammons, C. C. (1999). *Everybody's Different: Understanding and Changing Our Reactions to Disabilities.* Paul H. Brookes Publishing Co.

Parks, K. (n.d.). *Understanding the Context: Accessibility in Higher Education*. Adapted from previously published article for the NASPA Disability Knowledge Community. Retrieved from https://www.pcc.edu/resources/disability/documents/Context_Accessibility_HigherEd.pdf

Rights of Students with Disabilities in Higher Education: A Guide for College and University Students. (2013, July). Disability Rights California. Retrieved from http://www.disabilityrightsca.org/pubs/530901.pdf

Sachs, D., & Schreuer, N. (2011). Inclusion of students with disabilities in higher education: Performance and participation in student's experiences. *Disability Studies Quarterly, 31*(2). Retrieved from http://dsq-sds.org/article/view/1593/1561#top

Thompson, T., Burgstahler, S., & Comden, D. (2003). Research on web accssibility in higher education. *Information Technology and Disabilities E-Journal, 9*(2).

Webster, D. D. (2004). Giving voice to students with disabilities who have successfully transitioned to college. *Career Development for Exceptional Individuals, 27*(2), 151-175.

Whitaker, C. (n. d.). The Importance of Computer Labs on College Campuses. Retrieved from http://www.ehow.com/info_8269605_importance-computer-labs-college-campuses.html

Whiteneck, G. G., Harrison-Felix, C. L., Mellick, D. C., Brooks, C. A., Charlifue, S. B., & Gerhart, K. A. (2004). Quantifying environmental factors: A measure of physical, attitudinal, service, productivity, and policy barriers. *Archives of Physical Medicine and Rehabilitation, 85*(8), 1324 - 1335.

Yesilada, Y., Brajnik, G., & Harper, S. (2009). *How much does expertise matter? A barrier walkthrough study with experts and non-experts.* Paper presented at the Conference on Computers and accessibility (Assets), Pittsburgh, Pennsylvania.

Quality of Llife of Qatar University Students with Disability and its Relation to their Academic Adjustment and Performance

Asma Al-Attiyah,

Randa Mahasneh,

Department of Psychological Sciences,

Qatar University, Doha, Qatar

(almahsneh@qu.edu.qa)

Abstract

This study aimed at assessing the quality of life of Qatar University students with disability and its relation to their academic adjustment and performance. Seventy (70) students, 31 males, and 39 females participated in the study during the spring of 2017. Participants with sensory (visual or hearing impairments) numbered 25, with   physical impairment 32, and with learning disability 13 were assessed on six aspects of Quality of life, including, health, social and family, education, emotional life, mental health, and time management skills. Participants also reported their GPA and completed the academic adjustment assessment tool. Results showed medium to high levels of quality of life among students. Results showed that males' level of quality of life was higher than that of females on health, emotions, and mental health. The type of disability did not affect their level of quality of life. Further, significant relationships were found between quality of life aspects and academic adjustment. Furthermore, the quality of life

and academic adjustment predicted academic performance. Results were discussed using the contextual and cultural factors affecting students' quality of life and their academic adjustment.

Keywords: *quality of life; academic adjustment; academic performant; university students with disability.*

Introduction

The World Health Organization (WHO) defined the quality of life as "individuals' perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns. It is a broad ranging concept affected in a complex way by the individuals' physical health, psychological state, level of independence, social relationships, personal beliefs, and their relationship to salient features of their environment" (WHO, 1997, p.1). Precisely, the quality of life is related to a group of subjective and objective factors (Bonomi, Patrick, Bushnel & Martin, 2000). Mansy and Kazem (2010) explained that subjective factors could be seen through having a positive self-perception, being satisfied about life and work, and feeling happy. On the other hand, objective factors are related to materialistic things including income, health, housing, employment, and education.

Considerable attention was drawn to studying the quality of life of university students. Results of studies showed that the quality of life of university students is lower than working individuals from the same age group (Gilpin, White, & Pierce, 2005; Vaez, Kristenson, & Laflamme, 2003). Noy, Kaigang, Xia, Nattiporn, and Bock-Hee (2009) conducted a study aiming at examining the association between feelings, of hopelessness, suicidal behavior, and aspects of quality of life among college students in Korea, Thailand, and China. Results showed that feelings of hopelessness and suicidal behavior were significantly associated with most aspects of quality of life as reported by university students from all three countries. These results are consistent with the fact that getting in the university is not only a new step in education, but it is also a transition from adolescence to adulthood with new emotional, social, and functional aspects in life (Adams & Proctor, 2010). Consequently, students might experience mental and physical problems, because of the high expectations, challenges, and responsibilities associated with this phase of life (Ji & Zhang, 2011). Evidence from empirical studies supports the assumption that adjustment is an important predictor of students' success at university and is related to their academic performance (e.g., Abdullah, Elias, Mahyuddin, & Uli, 2009; Wintre & Bowers, 2007). Therefore, poor adjustment to the university academic and social demands may cause dropout (Mckay & Devlin, 2016; Spratt & Florian, 2015), and may affect the psychosocial and physical health of students (Knott & Taylor, 2014).

Recently, most universities support the inclusion of students with disability in their various programs (Buchanan, 2011; Konur, 2006; Newman, Wagner, Cameto, & Knokey, 2009). According to the International Convention on the Rights of People with Disabilities individuals with disabilities are conceptualized as "those who have long-term physical, mental, intellectual, or sensory impairments, which, in interaction with various barriers, might hinder their full and effective participation in society on an equal basis with others"(Division for Social Policy and Development Disability, 2009, Article.1). University experience is a great opportunity for persons with disability to achieve their potential and to improve their quality of life (Hutcheon & Wolbring, 2012; Nelson, Lovet, & Lindstron, 2015; Moswela & Mukhopabhyay, 2011). However, university students with disability may be at risk in terms of attrition, given that students with disability face the same stressors as their peers without disability, with additional challenges, including, inaccessible curricula, academic staffs' attitudes and issues related to infrastructure (Morina, Lopes-Gavira & Molina, 2015; Oliver & Barnes, 2010). Universities usually provide different types of retention programs, services and accommodations to support the inclusion of this student cohort (Herbert, Welsh, Hong, Soo-yong, Atkinson, & Kurz, 2014). For instance, universities provide adjustments related to curricula, learning and assessment, including extra exam time, note takers in class, extra notes given by faculty, assistance with learning or studying techniques, modifications for the exam style, and assistive equipment and technologies (Egan & Giuliano, 2009; Raue & Lewis, 2011; Squelch, 2010). Some universities also assign awareness-training programs for their academic staff to develop positive attitude and to implement inclusive teaching practices in classrooms (McKay & Devlin, 2016; Morina, Lopes-Gavira & Molina, 2015; Spratt & Flotian, 2015). Challenges related to the infrastructure, such as, inaccessibility of buildings, insufficient lifts, and lack of adaptive classrooms spaces are often resolved by universities worldwide (Kilpatrick, Johns, Barnes, Fischer, McLennan & Magnussen, 2017; Morina, Lopes-Gavira & Molina, 2015). Although services are often in place, recent research indicated that these students are still facing many constraints in various aspects of quality of life emergent from disability condition (Abreu, Hillier, Frye, & Goldstein, 2016; Hamblet, 2009; Koca-Atabey, Karanci, Dirik, & Aydemir, 2011). These constrains tend to limit their academic adjustment, their full involvement in university life, and consequently affect their academic performance (Brandt, 2011; Erten, 2011; Gibson, 2012; Hopkins, 2011).

Research studies investigating the quality of life of individuals with disability have been growing in recent years. However, results are not consistent. For instance, Rėklaitiene, Karpavčiūė and Požėrienė (2010) examined quality of life of individuals with 18year-old individuals with hearing impairment as well as individuals without disabilities. Interestingly, results showed that individuals with hearing impairment perceived their social relationships, general life, and health quality higher than individuals without disabilities. Another study conducted in Saudi Arabia showed that the quality of life of students with hearing impairment is lower compared to students without disability (Abulrab & Abdulahmed, 2013). Similar results were obtained in a study comparing the quality of life of university students with visual impairment with students without disability in Saudi Arabia (Alqasiri, 2014). In another study of

psychological well-being of college students with Attention Deficit/Hyperactivity Disorder (ADHD), Buchanan (2011) found that students had low scores on total well-being, environmental mastery, personal growth, and purpose in life. However, they reported comparable levels of autonomy, self-acceptance, and positive relations with others. Findings suggested that students with ADHD were like other students in their perceptions of well-being but perceived more difficulties in their organizational and goal-oriented competencies. The lack of consistency among the results of previous studies investigating the quality of life of students with disability was one of the motivators to perform the current study.

Despite the increasing number of students with disabilities in the Gulf universities, less attention has been directed to studying how undergraduate students adjust to university life, and how they perceive the quality of life (El Ansari, Labeeb, Moseley, Kotb & El‑Houfy, 2013; Mansy & Kazem, 2010). The current study extends past research in the field of inclusion of students with disability in higher education, by studying the relationship among quality of life, academic adjustment and academic performance. This study also addresses the scarcity of information related to this students' cohort in Qatar and the Arab Gulf countries.

Qatar University, the first and only national university in the state of Qatar, is committed to making its educational opportunities accessible to qualified individuals with disabilities in accordance with Law No. 2 of the year 2004, in the Constitution of Qatar: *'All citizens have the right to education, and the State shall endeavor to make general education compulsory and free of charge'* (Constitution of Qatar, Article.49, p.8). Moreover, Qatar National Vision 2030 emphasizes the significance of providing 'High quality educational and training opportunities appropriate to each individual's aspirations and abilities and accessible educational programs for life-long learning' (General Secretariat for Development Planning, 2008, p.16), in order to equip citizens with the knowledge to achieve their aspirations and meet the needs of Qatar's society. Under these legislations, all students regardless of their abilities and disabilities have equal opportunity and have access to education in Qatar University. To make the inclusion of students with disability a reality, the university established the Inclusion and Special Needs Support Center (ISNSC). The center focuses on two schemes; the first targets the quality of services provided to students with disability, and the second targets the systemic change in educational policies, professional development, and community outreach. The current study was conducted with the collaboration of ISNSC in Qatar University. Students with different types of disability, including mobility, hearing, visual, and learning disability, utilize the center to benefit from the provided services. The center provides different types of accommodations to students depending on the disability type and specific eligibility.

Assessing the quality of life of students with disability, and how they adjust to university is vital for universities to determine the most appropriate accommodations, which will help them achieve their best potential, thus making inclusion a reality. The current study extends past

research in the field of inclusion of students with disability in higher education, and addresses the scarcity of information related to this students' cohort in the Arabic Gulf countries.

Study Objectives

The current study aims at assessing the quality of life of Qatar university students with sensory (hearing and visual), mobility, and learning disability enrolled in Qatar University and its relationship with their academic adjustment and performance.

Specifically, this study attempts to answer the following questions:

1. What is the level of quality of life possessed by university students with disabilities? Are there significant differences in the quality of life of students with disability based on their gender, and type of disability (sensory, mobility, and learning)?

2. What is the level of academic adjustment of students with disability? Are there significant differences in students' academic adjustment based on their gender, and type of disability (sensory, mobility, and learning)?

3. What is the relationship between students' quality of life aspects, and their academic adjustment?

4. How do the quality of life of students with disability and their academic adjustment, influence their academic performance?

Method

Participants

A convenience sample of 70 undergraduate students with disability (N=31 males, N=39 females) participated in the study. Participants have three different types of disability including, sensory (visual or hearing disability) (N=25), mobility impairment (N=32), and learning disability (N=13). Students are from different levels of study (N=16) first year, (N=23) second year, (N=17) third year, and (N=14) fourth year. The range of their age is (18-26) years. Students were invited to participate in the study through the Inclusion and Special Needs Support Center (ISNSC) at Qatar University. Participants filled the questionnaire individually. Some of them received assistance in reading the items and/or writing their responses from the specialists working in the center or from students' volunteers.

Instruments

Two assessment tools were used to collect data:

The Quality of Life questionnaire: was developed and validated in the Arabic Language by Mansy and Kazem (2010) based on previous tools used to assess the quality of life. The

questionnaire consisted of two sections: Part I required students to provide demographic information by placing a check mark next to the item that applied to their case. Demographic information included gender, age, type of disability, field of study (program), year of study, and GPA. Part II required students to respond to 60 items to assess their perception of the quality of life on six aspects. The six aspects are health, social and family, education, emotional life, mental health, and time and management skills. Participants responded using a Likert scale of five points (ranging from 1- never, to 5 - always). Cronbach's Alpha coefficients were computed to check for the questionnaire validity. Alpha coefficient for all items was 0.91, and ranged from (0.62-0.85) for the six aspects of quality of life. All coefficients values were significant at $\alpha \leq$ 0.01, reflecting acceptable levels of internal consistency.

University students' academic adjustment tool: An assessment tool of 33 items was developed by the authors based on previous tools of adjustment to university life, such as the SACQ (Baker & Siryk, 1999). Items were formatted as questions with three answers (yes, not sure, no), two points were scored for participants who answered "yes", 1 when they answered "not sure", and 0 when their response was "no". Questions are related to aspects of academic adjustment to university including, value university degree, and area of specialization; satisfied with the program, professors, and courses; motivated to study, attend classes, do assignment and prepare for the exams; and managed time and effort to fulfil study requirements. The total score on all items represent the level of academic adjustment. The high score reflects high adjustment, while low score reflects low adjustment. Six experts in the field of educational psychology reviewed the items for content validity and provided feedback to the developers of the tool. Experts' comments were taken into consideration and were incorporated in the final copy of the questionnaire. Test-retest reliability of the assessment tool using 20 university students out of the study participants, with two weeks apart period, was performed. Results showed an acceptable Test-retest reliability, with a correlation coefficient of 0.82. Cronbach's Alpha coefficient was 0.79, which reflects an acceptable level of internal consistency.

Data Analysis

Data were entered and analyzed using the Statistical Package for Social Sciences (SPSS-23). Descriptive statistics (e.g. means and standard deviations), Univariate analysis of variance, and independent t tests were used to check for significant mean differences based on students' gender and type of disability. Multiple regression was preformed to assess the relationships among study variables.

Results

Means and standard deviations were computed to answer the first research question. Responses were divided into three levels of quality of life; low level with mean ranged (1-2.33), medium level (2.34-3.66), and high level (3.67-5). Table 1. shows the mean and standards deviation of students' responses on the quality of life aspects. Results showed medium to high

level on all aspects of quality of life. Among the six aspects, students rated the quality of social life as the highest, followed by Education and Mental health, while rated time management the lowest.

Table 1. Means and Standard Deviations of Students' Perceptions of Quality of Life

Quality of Life Aspect	Mean(SD)	Level
Health	3.39 (0.52)	Medium
Social	4.12(0.68)	High
Education	3.79 (0.71)	High
Emotion	3.32 (0.70)	Medium
Mental Health	3.79 (0.66)	High
Time Management	3.10 (0.48)	Medium
All aspects	3.57 (0.44)	Medium

Independent samples t- tests were conducted to find out if there were any statistical differences between males' and females' level of quality of life. Results of t-test are shown in Table 2.

Table 2. Independent samples t-test for the effect of Gender on Quality of life aspects

	Gender	Mean (Std.)	Description	T-test
Health	Male	3.69 (0.49)	High	5.03*
	Female	3.14 (0.41)	Medium	
Social	Male	4.28 (0.68)	High	1.71
	Female	3.99 (0.69)	High	
Education	Male	3.83 (0.83)	High	1.16
	Female	3.63 (0.59)	Medium	
Emotions	Male	3.72 (0.48)	High	4.95**
	Female	2.99 (0.69)	Medium	
Mental Health	Male	4.02 (0.64)	High	2.74**
	Female	3.60 (0.63)	Medium	
Time Management	Male	3.22 (0.55)	Medium	1.94
	Female	3.01 (0.39)	Medium	
Total Quality of Life	Male	3.79 (0.38)	High	4.20**
	Female	3.39 (0.40)	Medium	

Female (N=31), Male (N=39), ** = significate at $\alpha \leq 0.01$

Results showed that males' scores are higher than of females. It is worth noticing that male scores are high in all aspects except for time management, while female scores are medium in all aspects of quality of life. However, the differences are significant only for health, emotions, and mental health aspects, and on the quality of life in general.

Table 3. shows the means and standard deviations of the quality of life aspects according to the students' type of disability. As shown in table 3 below, there are some apparent differences in

the means. However, the results of the analysis of variance showed no significant differences in the quality of life in general and in all assessed aspects according to students' types of disability.

Table 3. Means of quality of life and analysis of variance according to type of disability

Quality of Life Aspects			Disability Type		Learning Disability	
	Male	Female	Male	Female	Male	Female
	Mean (Std)	Mean (Std)	Mean (Std)	Mean (Std)	Mean (Std)	Mean (Std)
Health	3.67 (.44)	2.93 (.29)	3.89 (.46)	3.32 (.39)	3.50 (.67)	3.20 (.50)
Social	4.39 (.60)	4.11 (.53)	4.03 (.94)	3.99 (.87)	4.32 (.54)	3.77 (.59)
Education	3.95 (.66)	3.65 (.58)	3.501 (.27)	3.75 (.65)	3.95 (.54)	3.31 (.46)
Emotion	3.65 (.45)	2.83 (.52)	3.94 (.50)	3.15 (.88)	3.65 (.54)	2.99 (.49)
Mental Health	3.96 (.49)	3.70 (.45)	4.28 (.80)	3.57 (.82)	3.85 (.79)	3.49 (.44)
Time Management	3.11 (.45)	2.97 (.18)	3.31 (.76)	3.03 (.54)	3.43 (.52)	3.01 (.38)
Quality of life total	3.79 (.37)	3.36 (.28)	3.82 (.52)	3.47 (.52)	3.78 (.25)	3.30 (.31)

To answer the second research question related to the level of academic adjustment reported by students with disability, the means and the standard deviation of the academic adjustment were computed according to gender and type of disability. Results are listed in Table 4.

Table 4. Means and Standard Deviations of Academic Adjustment of students with disability gender and disability type

Disability Type	Gender	N	Mean	Std. Deviation	Description Of Mean
Physical	Male	17	38.7059	13.13281	Medium
	Female	15	37.2000	8.87372	Medium
	Total	32	38.0000	11.18755	Medium
Sensory	Male	8	45.5000	11.04536	High

	Female	17	34.8235	11.06930	Medium
	Total	25	38.2400	11.96272	Medium
Learning Disability	Male	6	34.3333	14.61050	Medium
	Female	7	30.5714	6.39940	Medium
	Total	13	32.3077	10.64099	Medium
Total	Male	31	39.6129	13.08861	Medium
	Female	39	34.9744	9.62313	Medium
	Total	70	37.0286	11.43979	Medium

As shown in the table above, the mean of academic adjustment for all students, males, females and of all disability types ranged from (30-45). These values are considered medium given that the academic adjustment takes values from (0-66), therefore, values (0-21) can be considered low adjustment, (22-44) medium adjustment, and (45-66) high adjustment. It is worth noticing that males' adjustment scores are higher than females' scores in general, and in all disability types. Regarding adjustment scores for students of different disability types, physical, and sensory, were similar, 38, 38.24, respectively, and 32 for students with learning disability. Figure (1) presents the mean scores of students' adjustment according to their gender and type of
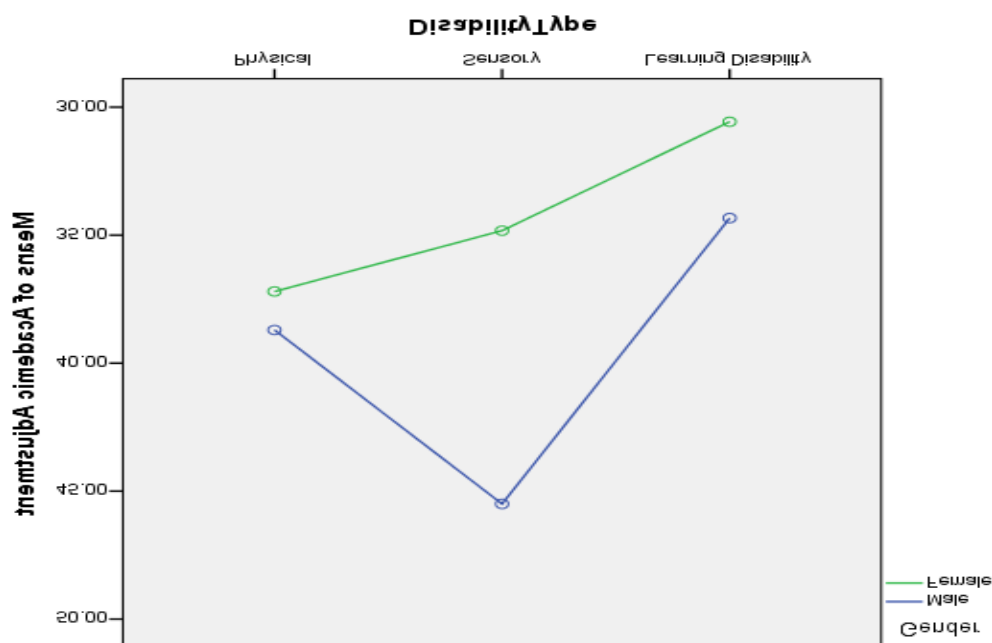
disability.

Figure 1. Means of Academic adjustment according to gender and disability type

Univariate analysis of variance was performed to assess if the apparent differences were significant. The analysis showed no statistical differences on students' academic adjustment based on their gender and disability type.

To address the third research question, what is the relationship between students' quality of life and their academic adjustment? Zero-Order correlations were performed between academic adjustment and the six aspects of quality of life, followed by a standard multiple regression. Table 5. shows the results.

Table 5. Correlation and Multiple Regression

Predictor Variables	Correlation with Academic Adjustment	β	b	t
Health	0.267*	1.136	0.052	.398
Social	0.284**	1.468	-0.09	-.538
Education	0.196	1.776	0.111	.808
Emotion	0.397**	3.169	0.196	1.226
Mental Health	0.467**	6.831	0.395	2.426*
Time Management	0.184	2.032	0.086	-.658
	$R^2 = .26$		Intercept =	-1.738

Dependent variable: Academic Adjustment
* = significate at $\alpha \leq 0.05$, ** = significate at $\alpha \leq 0.01$

Summary of Results
As shown in Table 5. four of the predictor variables had significant ($p < .05$) zero-order correlation with academic adjustment, but only Mental health had significant ($p < .05$) partial effects in the full model.

The six predictors model was able to account for 26% of the variance in academic adjustment, $F(6, 63) = 3.629$, $p < .004$.

Finally, a standard multiple regression analysis was performed to address the fourth research question: How do the quality of life of students with disability and their academic adjustment influence their academic performance?

Students' academic performance was measured by their self-reported GPA. The GPA of students' with disability ranged from [1.7-3.9] with mean 2.39 and Std. Deviation 0.49. The model $R^2 = 0.21$ reflects a significant relatively modest overall relationship between students' academic performance and the predictor variables F=2.296, df =7, P=0.03. The adjusted $R^2 = 0.16$ and Std Error of Estimate was 0.461. The effects of the individual predictor variables on students' academic performance are shown in Table 6.

Table 6. Multiple Regression Results

Independent Variables	Unstandardized Coefficients		Standardized Co<	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.98	.526		3.765	.000
Academic Adjustment	.007	.006	.153	1.162	.250
Quality of Health	.018	.128	.019	.141	.889
Quality of Social Relations	.183	.122	.263	1.501	.139
Quality of Education	.066	.099	.096	.666	.508
Quality of Emotion	.305	.117	.441	2.614	.011
Quality of Mental Health	.152	.132	.206	1.159	.251
Quality of Time Management	.233	.139	.229	1.684	.097

Dependent Variable: GPA

As shown in Table 6., only the quality of emotions contributed significantly to the students' academic performance measured by students' GPA.

Discussion

This study aimed to explore the quality of life of undergraduate students with disabilities at Qatar University. Interestingly, the results showed that students with disabilities reported medium and high levels of quality of life in all measured aspects. Previous studies showed that disability affects negatively the quality of life of students with disability (Rimmerman & Crossman, 2004; Roberts, Macmath, Martin, & Sigalet, 2006), and that individuals with disabilities reported lower levels of quality of life than individuals without disabilities (Abulrab & Abdulahmed, 2013; Alqasiri, 2014; Buchanan, 2011). However, our results can be explained in line with Antonovsky's (1992) study, which suggested that in developed countries, with a better rehabilitation system, people with disability receive reasonable support and their quality of life does not suffer. The state of Qatar often ranks as one of the richest countries in the world per capita. Therefore, it is expected that most of the materialistic needs and services of these students be satisfied. Qatar University is paying considerable attention to students with disability through the Inclusion and Special Needs Support Center (ISNSC) in Qatar University. Field, Sarver and Shaw (2003) reported that learning to locate and make use of supportive services is vitally important for students with disabilities who may struggle in a postsecondary educational setting. More importantly, arriving to university approves that those students were provided with support and resources from their families and communities which helped, and enhancing their quality of life. Likewise, students reported the social aspect of quality of life the highest among the other aspects; this is consistent with the point that the state of Qatar is considered one of the collective countries. In collective societies, social support and interaction are highly encouraged.

Interestingly, findings of this study suggested that male students reported higher level of quality of life than female students who reported medium levels on all aspects of quality of life. Further, the differences between male and female students were significant in three aspects of quality of life including, health, emotions, and mental health. These results indicated important implications for the ISNSC to plan and implement services aiming at empowering female students with disability in all aspects of life. This result is consistent with previous research that mentioned gender as an important variable affecting quality of life (Miller, & Dishon, 2006; Skucas, & Mockeviciene, 2009). Specifically, our results is similar to Skucas and Mockeviciene (2009) results which indicated that males have higher level of quality of life than females, and that quality of life domains related to aspects related to forming a family, employment, the size of income, psycho-emotional state and mobility by car is higher for males than that of females. However, our results is inconsistent with Al-Zboon, Ahmad, and Theeb (2014), and Schwartz, Keyl, Marcum and Bode (2009) studies which reported differences in quality of life due to gender in favor of females. Also, our result differs from Miller and Dishon (2006) results which indicated that there were no differences between females and males in quality of life.

Results showed no statistically significant differences due to type of disability. These results are supported by previous studies that highlighted the circumstance where individual lives as the critical factor in achieving higher quality of life rather than the disability itself (Al-Zboon,

Ahmad, & Theeb, 2014; Hallberg, Hallberg & Kramer, 2008; Nosek, Hughes, Swedlund, Taylor & Swank, 2003).

Results showed that time management was the lowest among all aspects of the quality of life; this finding highlights vital implication for the ISNSC to plan and implement training programs aiming at enhancing time management skills of students with disability.

Regarding the relationship between aspects of quality of life and academic adjustment, results showed that four aspects of quality of life are related significantly to academic adjustment including, the quality of health, social relations, emotions and mental health. Further, results showed that these aspects explains 26% of the variance in students' academic adjustment, and that mental health significantly predicted students' academic adjustment. Furthermore, quality of life and academic adjustment significantly predicted academic performance. However, among the six aspects of quality of life, the quality of emotions contributed significantly to students' performance. The results support that quality of life can be used as a reliable indicator of academic adjustment and performance. Therefore, programs targeting students' with disability adjustment to university life, should consider supporting students' emotions and mental health. Mental health difficulties, and negative emotions can be relatively mild anxiety and frustrations associated with everyday life, or severe problems affecting mood and ability to think and communicate. In most cases these difficulties are not apparent, thus it is unlikely to identify unless the student choose to discuss it. Therefore, more services need to be provided to this students' cohort including, training on how to cope with negative emotions, as well as individual and group counseling services to encourage students disclose any negative emotions and mental health issues they might experience.

Altogether, this study assessed the quality of life of students with disabilities, and identified areas of improvement. Findings of this preliminary study suggest useful implications for the university administration, and the ISNSC in Qatar University to improve the services provided to these students in order to enhance the quality of life, their academic adjustment, and their academic performance.

Limitations

The current study has some limitations that should be considered when examining findings. These limitations included the small sample size of 70 students from only one university. Because the sample was not a random, probability sample, findings must be interpreted with caution and this data may not generalize to other students in the Gulf region. Further studies with larger numbers of participants is needed. Furthermore, the study utilized a self-report questionnaire to collect data from participants. In future studies, different methods, such as interviews or observations could be conducted to achieve in-depth results regarding quality of life. We also recommend further research to compare the quality of life of individuals

with disabilities and individuals without disabilities along with other variables including students' psychosocial adjustment in addition to their academic adjustment.

References:

Abdullah, M.C., Elias, H., Mahyuddin, R., & Uli, J. (2009). Adjustment amongst first year students in a Malaysian University. *European Journal of Social Sciences*, 8 (3).

Abreu, M., Hillier, A., Frye, A., & Goldstein, J. (2016). Student experiences utilizing disability support services in a university setting. *College Student Journal*, 50(3), 323-328.

Abulrab, M. O., & Abdulahmed, F. A. (2013). Quality of life of hearing impaired students compared to normal students. *The International Interdisciplinary Journal of Education*, 2(5), 431-454.

Adams, K. S.; Proctor, B. E. (2010). Adaptation to college for students with and without disabilities: group differences and predictors. *Journal of Postsecondary Education and Disability, 22*(3), 166-184.

Alqasiri, E. M. (2014). Quality of life of visually impaired compared to non-disabled. *Reading and knowledge Journal*, 149 (2), 141-174.

Antonovsky, A. (1992). Can attitudes contribute to health? Advances. *The Journal of Mind-Body Health, 8*(4), 33–49.

Al-Zboon, E., Ahmad, J. F. & Theeb, R. S. (2014). Quality of life of students with disabilities attending Jordanian Universities. *International Journal of Special Education*, 29(3), 93-100.

Baker, R.W., & Siryk, B. (1999). *Student Adaptation to College Questionnaire (SACQ) manual*. Los Angeles, CA: Western Psychological Services.

Bonomi A. E, Patrick, D. L., Bushnell, D. M., & Martin, M. (2000). Validation of the United States' version of the World Health Organization Quality of Life. (WHOQOL) instrument. *Journal of Clinical Epidemiology*, 53(1), 13-17.

Brant, S., (2011). From policy to practice in higher education: The experiences of disabled students in Norway. *International Journal of Disability, Development and Education*, 58, 107-120.

Bunchanan, T., (2011). Attention Deficit/Hyperactivity Disorder and well-being: Is social impairment an issue for college students with ADHD? *Journal of Postsecondary Education and Disability,* 24(3), 193 -210.

Constitution of Qatar. (2004). Article.49, http://portal.www.gov.qa/wps/portal/!ut/p/a0/04_Sj9CPykssy0xPLMnMz0vMAfGjzOIt_S2cDS0sDNwtQg KcDTyNfAOcLD3cDdw9zfULsh0VAQl92_s!/

Egan, P. Giuliano, T. (2009). Unaccommodating attitudes: Perceptions of students as a function of academic accommodations and test performance. *North American Journal of Psychology.* 11(3), 487-500.

El Ansari, W., Labeeb, M. L., Kotob, S., & El-Houfy, A. (2013). Physical and psychological well‑being of university students: survey of eleven faculties in Egypt. *International Journal of Preventive Medicine*, 4(3), 293-310.

Erten, O. (2011). Facing Challenges: Experiences of Young Women with Disabilities Attending a Canadian University. *Journal of Postsecondary Education and Disability*, 24(2), 101-114.

Field, S., Sarver, M. D., & Shaw, S. F. (2003). Self-determination: A key to success in postsecondary education for students with disabilities. *Remedial and Special Education*, 24, 339-349.

General Secretariat for Development Planning. (2008). *Qatar National Vision 2030*. https://www.mdps.gov.qa/en/qnv1/Pages/default.aspx

Giangreco, F., Cloninger, C. (1993). Quality of life as context for planning and evaluation of services for people with disabilities. *Exceptional Children*, 6, 499–512.

Gibson, S. (2012). Narrative accounts of university education: Socio-cultural perspectives of students with disabilities. *Disability & Society*, 27, 353-369.

Gilpin, E. A., White, V. M., & Pierce, J. P. (2005). What fraction of young adults are at risk for future smoking, and who are they? *Nicotine & Tobacco Research*, 7(5), 747–759.

Hamblet, E. C. (2009). Helping Your Students with Disabilities during Their College Search. *Journal of College Admission*, 20 (5), 6-15.

Hallberg, L., Hallberg, U., & Kramer, S. (2008). Self-reported hearing difficulties, communication strategies and psychological general well-being (quality of life) in patients with acquired hearing impairment. *Disability & Rehabilitation*, 30(3), 203-212

Herbert, J. T., Welsh, W., Hong, B. S., Soo-yong, B., Atkinson, H. A., & Kurz, A. C. (2014). Persistence and Graduation of College Students Seeking Disability Support Services. *Journal of Rehabilitation*, 80(1), 22-32.

Hopkins, L. (2011). The path of least resistance: A voice-relational analysis of disabled students' experience of discrimination in English universities. *International Journal of Inclusive Education*, 15, 711-727.

Hutcheon, E.J., Wolbring, G. (2012). Voices of "disabled" post-secondary students: Examining higher education "disability" policy using an ableism lens. *Journal of Diversity in Higher Education*, 5 (1), 39- 63.

Ji, H., & Zhang, L. (2011). Research on college students' stresses and coping strategies. *Asian Social Science*, 7(10), 30-34.

Kilpatrick, S., Johns, S., Barnes, R., Fischer, S., McLennan, D., & Magnussen, K. (2017). Exploring the Retention and Success of Students with Disability in Australian Higher Education. *International Journal of Inclusive Education*, 21(7), 747-762.

Knott, F. & Taylor, A. (2014). Life at university with Asperger syndrome: A comparison of student and staff perspectives. *International Journal of Inclusive Education*, 18, 411-426.

Koca-Atabey, M., Karanci, A. N., Dirik, G., & Aydemir, D. (2011). Psychological wellbeing of Turkish university students with physical impairments: An evaluation within the stress-vulnerability paradigm. *International Journal of Psychology*, 46 (2), 106–118.

Konur, O. (2006). Teaching disabled students in higher education. *Teaching in Higher Education*, 11(3), 351-363.

Nelson, J.M., Lovett, B., and Lindstrom, W. (2015). Assessing, Documenting, and Accommodating ADHD in College Students. *The ADHD Report*, 23(6), 7-11.

Mansy, M., & Kazem, A. M. (2010). Developing and Validating of the quality of life measurements for university students in Oman. *Amarabak Scientific Journal*, 1, 41-60.

Mckay, J., & Devlin, M. (2016). Widening participation in Australia: Lessons on equity, standards, and institutional leadership. In M. Shah, A. Bennett, & E. Southgate (Eds.). *Widening higher education participation. A global perspective* (pp. 161-179). Oxford: Elsevier.

Miller, A., & Dishon, S. (2006). Health-related quality of life in multiple sclerosis: The impact of disability, gender and employment status. *Quality of Life Research*, 15(2), 259-71.

Morina, A., Lopes-Gavira, R., & Molina, V. (2015). Students with disabilities in higher education: A biographical-narrative approach to the role of lecturers. *Higher Education Research & Development,* 34, 147-159.

Moswela, E., & Mukhopabhyay, S. (2011). Asking for too much? The voices of students with disabilities in Botswana. *Disability & Society*, 26, 307-319.

Newman, L., Wagner, M., Cameto, R., & Knokey, A., M. (2009). The post-high school outcomes of youth with disabilities up to 4 years after high school. *A report of findings from the National Longitudinal Transition Study-2 (NLTS2) (NCSER 2009-3017)*. Menlo Park, CA: SRI International.

Nosek, M., Hughes, R. B. Swedlund, N. Taylor, H.B. & Swank, P. (2003). Self-esteem and women with disabilities. *Society and Medicine*, 56(8), 1737-47.

Noy, K., Kaigang, L. Xia, X., Nattiporn, N. & Bock-Hee, P. (2009). Hopelessness and Suicidal Behavior among Chinese, Thai and Korean College Students and Predictive Effects of the World Health Organization's WHOQOL-BREF. *International Electronic Journal of Health Education*, 12, 16-32.

Oliver, M., & Barnes, C. (2010). Disability studies, disabled people and the struggle for inclusion. *British Journal of Sociology of Education*, 31, 547-560.

Rėklaitiene, D., Karpavčiūė, S. & Požėrienė, J. (2010). The Quality of Life of People who are Deaf and with Hearing Impairment. *Special Education*, 22(1), 17–24.

Rimmerman, A. & Crossman, R. (2004). The Quality of Life of Single Adults with Severe Disabilities Participating in Extended Employment Programs in Northern Israel. *Journal of Rehabilitation*, 70(2), 47-52.

Roberts, J., Macmath, S., Martin, J., Sigalet, D. (2006). Body Disfigurement and the Quality of Life of Adolescents with Pectus Excavatum: Effects of the NUSS Procedure. *Physical Disabilities: Education and Related Services*, 24(2), 21-46.

Raue, K., & Lewis, L. (2011). *Students with disabilities at degree-granting postsecondary institutions* (NCES 2011-018). Washington, DC: National Center for Education Statistics.

Schwartz, C.E., Keyl, P.M., Marcum, J.P., Bode, R. (2009). Helping others shows differential benefits on health and well-being for male and female teens. *Journal of Happiness Studies*, 10, 431–448.

Skucas, K. & Mockeviciene, D. (2009). Factors influencing the quality of life of persons with spinal cord injury. *Special Education*, 2(21), 43-50.

Spratt, J. & Florian, L. (2015). Inclusive pedagogy: from learning to action. Supporting each individual in the context of 'everybody. *Teaching and Teacher Education*, 49, 89-96

Squelch, J. (2010). Reasonable Accommodation of University Students with Disabilities. http://search.informit.com.au/documentSummary;dn=498712457339743;res=IELHSS.

Division for Social Policy and Development Disability (2009, Article. 1). *The Convention on the Rights of Persons with Disability*. UN. https://www.un.org/development/desa/disabilities/convention-on-the-rights-of-persons-with-disabilities/convention-on-the-rights-of-persons-with-disabilities-2.html

Vaez, M., Kristenson, M., Laflamme, L. (2003). Perceived quality of life and self‑rated health among first‑year university students; a comparison with their working peers. *Social Indicators Research,* 68 (2), 221-234.

Wintre, M. G., & Bowers, C. D. (2007). Predictors of persistence to graduation: Extending a model and data on the transition to university model. *Canadian Journal of Behavioral Science / Revue Canadienne des sciences du comportment*, 39(3), 220-234.

World Health Organization, Division of Mental Health and Prevention of Substance Abuse. (1997). WHOQOL Measuring Quality of Life. Cited by 42Get access Volume 9, Issue 1 May 2006, pp. 45-51

Developing a Proposed Training Program Based on Discrete Trial Training (DTT) to Improve the Non-verbal Communication Skills in Children with Autism Spectrum Disorder (ASD)

Mohammed Akram Hamdan,

Faculty of Education and Arts,

Department of Special Education,

University of Tabuk,

K.S.A.

Abstract

The present study aimed to develop a proposed training program based on DTT to improve the nonverbal communication skills in children with ASD. To achieve the objective of the study, the author developed a scale of non-verbal communication skills consisted of (20 items) measures attention and eye contact, imitation and using the signal, understanding the facial expressions and tones of voice. The author also developed a DTT program by reviewing the previous literature. The study sample consisted of (26) children with ASD aged (6-11) years, were chosen deliberately and divided randomly into two groups: an experimental group consisted of (13) children, and a control group consisted of (13) children. The results showed a statistically significant difference at the level of significance (0.005) between the performance of the experimental and the control groups on the non-verbal communication skills scale in favor of the experimental group. On the other hand, the results indicated that there are no differences in the experimental group between post-test and following up phases.

Keywords: *training program, discrete trial training (DTT), non-verbal communication skills, children with ASD.*

Introduction

Autism spectrum disorder is a complex neurological and developmental disorder that causes lifelong difficulties (the national autistic society, 2012). It is characterized by impaired in two main domains: social-communication and behavior domain (amaze, 2015). The recent estimates issued by world health organization (WHO), indicates that the prevalence of ASD is 1/160 children in the world, this estimate refers to the average and varies a lot by countries and studies (WHO, 2013). Others estimates reached 1/88 upon the center for disease control and prevention (CDC), and autism and developmental disabilities monitoring network (ASSM). In march 2013 (CDC) indicated to new estimates reached to 1/50 individual in the school community (Kira, 2014).

In spite of the great scientific efforts, the causes of ASD are mysterious, so the medical reports indicate that there is no specific and convincing reason to explain the occurrence of the disorder. However, the genetic causes have emerged as a significant. On the other hand, the causes of nervousness play a significant role which indicates that there is some dysfunction in the central nervous system, which confirms that ASD accompanies many neurological disorders. Several studies have linked the relationship between metabolic, chemical and environmental factors and ASD. Although there are many interpretations about the causes of the disorder, but many of them are still hypotheses and controversial among researchers and scientists (Hallahan, Kauffman & Pullen, 2012).

Discreet Trials Training (DTT)

Children with ASD usually do not learn in their environments spontaneously, so they need extra cues, direct and structured teaching of new skills. They must be taught repeatedly, be engaged actively with the environment in order to acquire new skills. DTT is one of the many strategies based upon the principles of applied behavior analysis (ABA) to facilitate learning. It consists of a series of direct, systematic instruction methods, used repeatedly until the child acquires the skill. DTT focuses on the analysis of skills into small elements and units. In this method the skills are individually taught through repeated attempts (Smith, 2001).

DTT is one of the types of interventions and intensive behavioral programs which proved its success for children with ASD. This type of intervention is a systematic process based on the principles of learning theory. It is an attempt to change behavior by evaluation of the functional relations between the target behavior and environmental factors (Gupta, 2004).

This strategy was used to help individuals with ASD to acquire many skills, such as expressive and receptive language, imitation, playing, social, emotional, physical, academic, and daily living skills, etc. (Smith, 2001; Lovaas, 2003). Children with ASD often respond to this type of intervention, so Lovaas study indicated that the young children who have been interfered within this kind of intensive intervention, they had achieved high levels of physical, mental, and academic skills after three years of intervention, and they have continued to generalize the skills for many years (Lovaas, 2003).

These types of strategies assist the teaching of new skills in a conducive learning environment. It includes a series of distinct lessons or the attempts that are taught by a teacher to each child (1:1). Lovas defines this attempt as one unit consisting of a complex behavioral sequence which is broken down into small steps to make it easier for the child to learn and to reach the ultimate goal (Lovaas , 2003). DTT is usually applied in natural environments, such as, the home or the center. The duration of training by using this approach needs of (2-5) seconds in

average between each attempt (Unlu & Vuran, 2012). Moreover, it requires an application period of (30-34) hours a week or (8) hours a day, and it continues for (3) years (Ekeseth Smith, Jahr & Eldivik, 2007). The training on this program also requires providing a special coach, it confirms that the family must be involved and participate in the routines. On the other hand, the training must be implemented within natural environments where the child lives (Unlu & Vuran, 2012).

There are many advantages for using DTT: it is based on very short teaching units (1-5) seconds, to facilitate and speed up the process of learning and skill acquisition, which provides also more than 200 learning opportunities in one hour (Smith, 2001); it is. suitable for children in preschool age who usually have developmental delay and limited capabilities. Moreover, the intervention focuses on using prompting, shaping and positive reinforcement techniques which usually help to acquire the skill, and lead to high levels of interactivity between the teacher/coach and the child. Finally, the use of short learning units in this intervention increase the involvement of teachers' flexibilty in learning activities with the child during the school day. This intervention does not only help the child to acquire learning opportunities quickly during the day, but also helps him/her to generalize the acquired skills at different times, in different environments and with different persons (Downs, Fossum and Rau, 2008). DTT intervention is evidence based, as data are collected on every attempt to monitor the child's progress based on continuous assessment. Data are collected on each correct and incorrect response. The correct or incorrect responses are calculated to determine the percentage of   the child's performance level. The data collected are analyzed to identify relevant patterns in the response, including increasing or decreasing the target behavior. The data collection provides a basis for selecting effective teaching methods, to specify the beginning of training of skill or new behavior, and to make decisions about the identification of the appropriateness of prompting used to achieve the goal of teaching and when to begin the training for the next sequence of social, verbal, emotional behavior in order to prepare the child towards independence (Smith, 2001).

The basic elements in DTT
Both Al-Shami (2004) and Smith (2001) indicated that DTT includes a set of basic elements, as follow:
- Discriminatory stimulus: is an antecedent stimulus that cues an organism to perform a learned behavior.
- Instructions: a group of stimuli that guides the child's behavior when the response occurs, these instructions must be clear, simple and few.
- Response: is what the child said or done when seeing and hearing the discriminatory stimuli, it is classified as a correct or incorrect response.
- Reinforcement: is any motivation follows the response that increases the probability of occurrence the behavior and repeating it, so it must be delivered directly after the correct attempt, also must be desirable for the child.
-The interval between the occurrence of responses: is the interval between occurrence of the first and second response. The goal is to move the child from the first attempt to the second. During this period, the teacher records and notes the child's response in the previous attempt, and also allows the child to interact with the reinforcement.

Steps of DTT

Bogin, Sulivan, Rogers & Stabel (2010) noted the steps of DTT, as:

1. The teacher identifies what will be taught: in this step, the teacher decides what are the expected goals and discusses the planned objectives with the teamwork, especially the parents, then s/he reviews the chosen objectives and rebuilds them, if needed.

2. The teacher analyzes each skill into sub-skills, then identifies each step in the skill, and arrange it in a sequent and clear manner to makes it easier for teamwork members to implement and monitor the teaching process, if necessary.

3. Selection of the data collection system: the teacher identifies and designs the data collection schedule for skills that are taught, this is done by a specially designed schedule after selecting the teaching plan. The schedule, usually, includes a place dedicated to documenting the prompting level and mastery criterion, and a place to record the data when the child achieves the skill.

4. Designing and organizing the place/location: in this step, the teacher determines a list of potential locations and places to implement the training, it must be quiet, has sufficient space for teaching, rest and playing, has good and sufficient lighting, also must be accessible, then the teacher determines the appropriate places after the assessment, so he usually chooses two or more instead of one site.

5. Collection of materials: the teacher collects materials and tools for using during the training process. One of these materials are: handbook of data collection and communication with the teamwork members, a set of reinforcements, pictures and tools for social activities, teaching materials including shapes, colors, letters, numbers and other things related to materials as a cube, toys, pens, pencils, bullets, boxes for storage, etc.

6. Delivery of attempts: the teacher evaluates and preambles the child to go to the training place, then gets the attention of the child and identifies the necessary reinforcement, after that, he starts teaching by providing discriminatory stimulus, then waits until the response occurs, then he reinforces the correct response and provides feedback for incorrect attempt, and begins to try again (providing the discriminatory stimulus) and provides the necessary prompting or moves to the next attempt.

Literature Review

Awijan (2012) conducted a study aimed to investigate the effectiveness of a training program in the development of non-verbal communication skills (attention, imitation, eye contact, understand some of the physical gestures, facial expressions and voice tones function), in children with ASD in Damascus governorate. The study sample included (20) children, were distributed into experimental and control group. To achieve the aim of the study, the researcher prepared a list of non-verbal communication skills assessment, the researcher also builds a training program to develop those skills. The results indicated the effectiveness of the training program in developing the skills of non-verbal communication skills in children with ASD, as well as the results indicated that the development of non-verbal communication skills has continued after two months except attention and eye contact skills.

According to study of Tsiouri, Simmons & Paul (2012) aimed to evaluate the intervention based on DTT in improving the fast imitation in children with ASD. The researchers used a set of tools to measure the non-verbal cognitive abilities, are the diagnostic observations schedule, and the symbolic behavioral communicative scale to measure communication and using of words. The sample consisted of (5) children with ASD aged from (3-6) years. The results of the survey indicated that three out of five produced and achieved words, good performance and evident in

the early using of spoken language. The results also showed that there has been an increase in the level of performance of all participants in producing the right words.

Turner (2011) conducted a study aimed to compare the two methods of teaching based on DTT and regular teaching. The study was conducted to determine which methods are effective in improving and helping children with mental disabilities in generalizing their acquisition of numeracy. The sample of the study consisted of three children with intellectual disability attend in special education classes in middle public schools in Ohio. Data were collected about their performances twice every week, and it was compared to determine which strategies were more effective in helping children to generalize the acquired skills. The results of the study showed that these methods were effective in helping children with intellectual disability in mastering the skills. However, there was one child had acquired the skill slowly through DTT method, but all the children had been able to apply the skills in different places.

Holding, Bray & Kehle (2011) studied of comparing the effectiveness of training on fluency and DTT in training of children with ASD on expressive language skills including classification names. The sample of the study consisted of (4) children aged (3-6) years, they were taught by intensive training sessions ranged between (20-30) hours a week, they were trained by specialists in ASD. The results showed that the use of fluency training can lead to acquiring and generalizing the skills quickly. Moreover, this method can lead to change the children's treatment and behavioral problems, also can lead to improving their performance and participation in school and with their family.

Downs, et al., (2008) researched in the evaluation of the effectiveness of two models of teaching through using DTT with children with developmental disabilities attending preschool programs with typical children. All children participating in the baseline have been assessed with development delay in many significant functional domains (cognitive, behavioral, adaptive behavior, language and communicative, and motor skills), the intervention continued one year, where each child received the training through individual sessions ranged (10-15) minutes a school day. Results showed that children exposed to both models of teaching have acquired new skills quickly and statistically significant. Results also indicated that the method of training through DTT has the possibility to use it professionally and effectively in public preschool programs with children with developmental disabilities.

Iben Seddeiq's study (2005) aimed to measure the effectiveness of a proposed program on development of non-verbal children with ASD and its impact on social behavior. The study sample included (38) children diagnosed with ASD. The researcher built a scale to assess the non-verbal and the social behavior skills, she also built a training program to improve the non-verbal communication skills. The results of the study found statistically significant differences in non-verbal communication skills between the experimental group and the control group were in favor of the experimental group on the post-test, except that there were no significant differences in the social behavior between the two groups.

Statement of the Problem

The current study came to investigate of effectiveness of a proposed training program based on DTT to improve the non-verbal communication skills in children with ASD, it has attempted to answer the following two questions:

• Are there statistically significant differences at the level of significance ($p < .05$) in improving the non-verbal skills in children with ASD between the experimental and the control group favoring to the training program?

• Are there statistically significant differences at the level of significance (p<.05) in the non-verbal communication skills in children with ASD in the experimental group on the pos-test and following up phases based on the training program?

Methodology
Population and Sample
The study sample included (26) children with ASD (16 male, 10 female) aged (6-11) years, were selected from two centers and institutions that provide education and training services for children with ASD in Amman city. The participants were selected deliberately based on: first, the diagnostic evaluation and the individual educational programs reports which indicated significant difficulties and problems in the non-verbal communication skills. Second, the teacher students attended in those institutions who will participate in training of the children in the experimental group. To investigate the effectiveness of the training program, the members of the study sample were distributed randomly into two groups: the experimental group enrolled in the training program, consisted of 13 children, and the control group did not enroll in the training program, consisted of 13 children. The parents signed the approval forms for their child to participate in the research.

Instrument
To achieve the aim of the study, the author used the following tools:

The non-verbal communication skills scale.
The author developed a scale of non-verbal communication skills for children with ASD in the age group (6-11) years, included (20) items measure (attention and eye contact=8 items), (imitation and using of the signal=9 items), (understanding facial expressions and tones of voice=3 items). The scale used an interval Likert-type scale (always, often, sometimes, rarely, never). Always indicate that the child performs the skills in (9) correct trails, often means that child performs in (6-8) correct trails, sometimes means that the child performed the skills in (3-5) correct trails, rarely means that the child performs the skills in (1-2) correct trails, never means that the child does not perform the skills correctly.

The author developed the scale by reviewing previous literature from some studies, such as, (Nasr, 2001: Iben Seddeiq, 2005: Sigman, 1990), and from the scales developed a list to examine the non-verbal communication skills in children with ASD such as (CARS-2; GARS-2), the scale was built in initial phase by collecting the items, then it was revised.

To investigate of the validity and reliability indicators, the scale was revised in the initial phase from a group of experts and specialists in the field of special education, working in the field of special education especially in ASD, and educational supervisors and university professors. They revised the scale's content, language, and the appropriateness of the alternatives. After that, the author adopted items agreed to (80%), and taken all amendments relating to the language, merging some items, adding other which indicated by judges.

The author extracted the constructive validity by calculation each item with the total degree of the scale using Pearson coefficient correlation, (Table 1).

Table 1. Pearson correlation values of item with the total degree of the scale of the non-verbal communication skills

Correlation value	Item n	Correlation value	Item n	Correlation value	Item n
89.	15	89.	8	66.	1
82.	16	90.	9	77.	2
76.	17	87.	10	84.	3
90.	18	67.	11	56.	4
68.	19	60.	12	75.	5
78.	20	74.	13	76.	6
0	0	82.	14	81.	7

Table 1 indicates that the values of correlation coefficients ranged (.56-.90) and it was statistically significant at the level (p<.05). These values were acceptable for purposes of the study.

Regarding to reliability indicators, it was calculated by the internal consistency method (Cronbach' Alfa Coefficient) which was steadfast in this way (at .92), also by (test re-test), so the author applied the scale on (10) children with ASD from outside of the study sample, after that he applied the scale again on the same sample three days later. The total value of coefficient consistency was (.88), these values are generally accepted for purposes of the study.

DTT Program.

The author built the proposed training program based on DTT by reviewing the previous literature regarded to developing and designing the training programs related to the DTT and the teaching strategies used in this training, as well as the teaching methods used in developing of the non-verbal communication skills, as noted in (Iben Seddeq, 2005; Lynn, 1999). The author also reviewed the books related to development of the non-verbal communication skills. The program adopted the principles and foundations of this type of intervention (individual teaching, providing discriminatory stimuli, using the cues and prompting, reinforcement, feedback, generalization, etc.). The program included a set of long-term objectives is divided into short term goals as follows:

- Objective 1: to improve the non-verbal communication skills (attention and eye contact) in children with ASD in the age group (6-11).
- Objective 2: to improve the non-verbal communication skills (imitation and using the signal) in children with ASD in the age group (6-11).
- Objective 3: to improve the non-verbal communication skills (understanding the facial expressions and tones of voice) in children with ASD in the age group (6-11).

The program included (36) training session, (3) sessions a week, (35) minutes for each session. The sessions included a preparation at the beginning of the session continued (5) minutes, focused on selecting and creating the session place, sitting with the child in the place and on the table of training, welcoming to the child and talking to him about his activities and daily life, and revising the child goals acquired in the training previous sessions. The program also included the actual procedures for training lasted (20) minutes for each session, focused on directing the child attention, and providing the educational objective using the principles based on the training program and method of intervention. It also included final procedures lasted (10) minutes for each session focused on implementing the skill with different individuals and in

different environments to make sure that the child mastered and generalized the skill. The program used a set of tools, methods, and devices such as using the computer, pictures, cards, recorder, toys, using cartoon movies, etc. To investigate the validity of program was achieved.

The Program Module

In the beginning, the author reviewed the previous literature related to the developing of training programs using DTT, also the training programs related to the development of non-verbal communication skills. The training program is designed in the first phase, so the author developed the long and short-term objectives of the program, and he wrote the training sessions for each objective which included the steps of teaching, tools, reinforcement, methods and procedures used in teaching. The program is offered in the initial phase to a group of judges to make the necessary amendments. The author adopted all the amendments and the notes indicated by judges.

Procedures of Application of the Program

The author developed the non-verbal communication skills scale and the proposed training program, then he sent it to a group of experts to revising. After that, he applied the scale on all the study sample, then divided the sample into two group.

To apply the training program, the author presented a workshop for (5) of the teacher students attended in the practical training program in department of special education in the university of Jordan in the second semester 2015-2016. The teacher students already were distributed within two institutions which provide services for children with ASD in Amman city (the institutions which included the study sample). The author discussed the teacher students about the purpose of the program and its objectives, content, and sessions, also he presented an ideal model about training session for them to clarify the steps and the procedures they will use in the program. After that the student teachers were asked to provide a training session to assess their competencies, then they were asked to start the training sessions for children participating in the experimental group. The author followed up implementing the training sessions to monitor the children performance progress and to provide feedback to the students. teachers

In the end of the training sessions, post-test was applied to all the children participating in the study (both the experimental and the control group) to examine the effect of the training program. Also, a following up test was used to determine the differences in the experimental group scores after two weeks from receiving the training program. The data were analyzed using SPSS.

Study Design

The quasi-experimental was utilized in this study which aimed to develop a proposed training program based on DTT to improve the non-verbal communication skills in children with ASD. The study used the equivalent groups design, pre- and post- test and following up test were used. The study included an independent variable (the proposed training program), and a dependent variable (non-verbal communication skills).

Results
Results related to the first question:

To answer this question means and standard deviations were used to compare the performance of the study sample in the experimental group who enrolled in the training program on DTT and the control group who didn't enroll in the training program. Table 2 shows means

and standard deviations of the experimental and the control group on each of pre- and post-test.

Table 2. Means and standard deviations of the experimental and control groups on each of pre- and post-test.

	Pre-test		Post-test
Standard deviation	Means	Standard deviation
0.10	3.34	0.09
0.24	2.44	0.11

Table 2 shows that the means of the experimental group reached (2.60) on the pre-test and (3.34) on the post-test, while the means of pre -test for the control group reached (2.34) and (2.44) on the post-test. These results indicate that there are apparent differences in the non-verbal communication skills between the two groups on post-test, so the mean of the experimental group was higher than the control group. In order to examine if there are significant differences at ($p <.05$) between the two groups on the post-test, analysis of co-variance was conducted. Table (3) presents that:

Table 3. Results of analysis of co-variance on post-test (non-verbal communication skills) between the experimental and control groups.

Recourse	.Type iii sum of squares	Df	Means square	F	.Sig
Pre-test	005.	1	005.	312.	000.
The training program	14.32	1	14.32	923.67	007.
Errors	0.356	23	0.356		
Total	14.681	26			

(*) statistically significant differences at p<.05

Table 3 shows statistically significant differences at the level of (p<.05) between the experimental and the control groups performance on the non-verbal communication skills scale refer to the effectiveness of the training program, f=(923.67) is a statistical significant at the level of (p<.05). The adjusted means was extracted for the experimental group which enrolled in the training program and the control group to determine the recourse of the differences. Table 4 shows that:

Table 4. Adjusted Means of experimental and control groups

Group	Adj. Means	Standard errors
Experimental group	3.34	5.11
Control group	2.44	5.44

Table 4 indicates that the adjusted means of the experimental group was (3.34) is higher than the mean of the control group (2.44), this indicates that the training program based on DTT had an impact in the experimental group on the non-verbal communication skills. To measure the effect size, Eta-squared is calculated by (0.181), this indicates that the variance in the performance of the experimental group enrolled in the training program on the non-verbal communication skills returns to the training program.

Results related to the second question:

To answer this question means, Standard Deviation and (t) value was calculated to determine the differences in the experimental group on the post-test and following up phase. Table 5 clarifies that:

In Table 5, By looking to (t) to examine the effect of continuation of the training program on the total score of the non-verbal communication skills scale, it shows that there are no significant differences at the level (0.05) in the non-verbal communication skills between the post-test and following up phase, so (t) reached (0.750) and means of post-test (3,34), whereas means of following up (3,22). These results indicate to the effect of continuation of the training program in improving the non-verbal communication skills.

Table 5. Means, standard deviation and (t) value in the experimental group on the post-test and following up phase.

Sign. Level	T	Df	Standard Deviation	Means	Sample	Test	Variable
			0.09	3.34	13	Post-test	Non-verbal Communication skills
0.301	0.750	12	0.08	3.22	13	Following up	

(*) statistically significant differences at p<.05

Discussion and Recommendation

The current study aimed to develop a proposed training program based on DTT to improve the non-verbal communication skills in children with ASD. The results showed on the first question "Are there statistically significant differences at the level of significance (p<.05) in improving the non-verbal communication skills in children with ASD between the experimental and the control group return to the training program?". The results indicated statistically significant differences at the level of (p<.05) between the experimental and the control groups in the performance of non-verbal communication skills, due to the impact of the training program f=(923.67) is a statistical significant at the level (p<.05). The results also indicated that adjusted mean of the experimental group was (3.34) is higher than the mean of the control group (2.44). on the other hand, the findings indicated that there are no significant differences at the level (p<.05) in the non-verbal communication skills between the post-test and following up phase. This clarifies that the training program had an effect even after stopping the application.

The author attributed these findings to the role and effectiveness of the training program based on DTT to improve the non-verbal communication skills in children with ASD. The program worked on improving the skills of attention and eye contact, imitation and using the signal, understanding facial expressions and tones of voice. The results showed that the performance of children in the experimental group was weak and inability to develop such those skills effectively before involving in the training program, but after receiving the training program they were able to perform those skills in a significant. This result confirms that the

training method based on DTT was effective. It is the inevitable result, because this method focuses on employing short teaching units, and it's a style of direct and systematic teaching methods using repeatedly for many times to master a skill. The method also focuses on task analysis which uses small instruction units and elements, also which uses one by one (1:1) style and focuses on the use of instructional methods and procedures based on prompting (Smith, 2001). Moreover, this method focuses on using intensive behavioral interventions (Gupta, 2004). It also uses methods of repetition and positive reinforcement which usually result to acquire the skill inevitably (Downs, et al., 2008). Whatever, the results of this study on the first and second questions are similar to the results noted by (Awijan, 2012; Holding et al., 2011; Iben Seddeiq, 2005) which indicated to the effectiveness of the training programs used in developing of the non-verbal communication skills in children with ASD and others in all even in the following up phase after the end of application.

The result of study also similar to results of Tsiouri, et al., (2012) which indicated that the intervention based on DTT led to improvement of rapid imitation skills for children with ASD, it also showed that there was an increase in the level of performance of all sample members in using the right words. The results also similar to the results of Turner's study (2011) which indicated that the systematic teaching method and the training using DTT were effective in helping children with intellectual disabilities in mastering and generalizing the acquired skills. It also agreed with the results of Downs, et al., (2008) which indicated that the children enrolled in the teaching method using DTT, have acquired new skills in a statistically significant and quickly. This proves that the DTT has a great teaching effectiveness when it is provided for children with ASD, also has the possibility to use effectively and professionally in public preschool programs with children with developmental disabilities.

Finally, although the findings of the current study showed an improvement in the non-verbal communication skills for children with ASD even in the following up phase, it did not present long time strong evidence to prove that the method has helped these children to continue and generalize to acquire the training program skills in different environments and times and with different persons after receiving the training program, principally that the period between the end of application of program and following up phase is short (only two weeks), so it may be hadn't enough in determining the effectiveness of the continuation of the program.

Mohauture's studies have to investigate whether this intervention leads to long time results in improving the ability of those children to generalize the acquired skills in the training program. The future studies also have to investigate the effectiveness of this type of intervention with different age groups and with children with other developmental disorders and have to examine various other variables. Eventually the researcher could use other methodology especially the single-case study design which depends on using of base line design.

References:

Amaze, Inc "*Autism spectrum disorder: information booklet*". Internet: [Nov. 10, 2016].

Al-Shami, Wafa'. *Therapy of autism, educational, psychological and medical methods.* Riyadh: Fahd national library. 2004.

Bogin,J., Sulivan L, Rogers, S. & Stabel, A. (2010, Sept.). "Discreet *trail training: steps for implementation". Development center on autism spectrum disorder*. Retrieved from

http://www.ebookinga.com/pdf.

Downs, A., Downs, R., Fossum, M., and Rau, K. (2008). The effectiveness of discrete trial teaching with preschool students with developmental disabilities. *Education and training in developmental disabilities*, 43, 443–453.

Ekeseth, S., Smith, T., Jahr, E. & Eldivik, A. (2007). Outcome for children with autism who began intensive behavioral treatment between ages 4-7: a comparison controlled study. *Behavior modification*, 31:264-278.

Ewijan, Bushrah (2012). *The effectiveness of a training program in developing the non-verbal in children with Autism*. (master thesis), university of Damascus.

Gupta, A.& Singhal, N. (2005). psycho-social support for families of children with autism. *Asia pacific disability rehabilitation journal*, 16(2).

Hallahan, D., Kauffman, J., & Pullen, P. (2012). *exceptional learners: an introduction to special education*, (12ed.), Boston, Ma: Allyn & Bacon.

Holding, E., Bray, M. & Kehle, T. (2011). Does speed matter? A comparison of the effectiveness of fluency and discrete trail training for teaching noun labels to children with autism. *Psychology in the schools*, 48, 166-183.

Iben Seddeiq, Lina (2005). *The effectiveness of a proposed program in developing the non-verbal skills in autistic children and its impact on social behavior*. (doctoral dissertation), university of Jordan, Amman, Jordan.

Kira, Chantal (2014). *Autism spectrum disorder*. The complete guide to understanding autism., New York, USA: A perigee book

Lovaas, O. (2003). *Teaching individual with developmental delays*: basic intervention techniques. Austin, Texas: Ported.

Lynn, A. (1999). Auditory integration training and facilitated communication for autism. *Journal of child psychology and psychiatric*, 11,285-324.

Nasr, Soha (2001*). The effectiveness of therapy program in developing the linguistic communication in some children with autism*. (doctoral dissertation), Ain Shams university, Cairo, Egypt.

Sigman, M. & Capps, L. (1997). *Children with autism developmental perspective*. Harvard university press. Retrieved from://http.harvard.edu.org/book.

Smith, T. (2001). Discrete trial training in the treatment of autism. *Focus on autism and developmental disabilities*, 16,86–92.

The National Autistic Society. (2012). *Early support for children, young people, and families*. Retrieved from: / - www.ncb.org.uk/earlysupport / in 9/29/2014/HYPERLINK

Tsiouri, L., Simmons, E. & Paul, R. (2012). Enhancing the application and evaluation of a discreet trail intervention package for eliciting first words in pre-verbal preschoolers with ASD. *Autism Development Disorder*, 42,1281-1293.

Turner, Lynn (2011). *A comparison of discrete trial training and embedded instruction on the promotion of response maintenance of coin counting skills for middle school students with intellectual disabilities* (Master thesis). the Ohio state university, USA.

Unlu, E. & Vurna, S. (2012). Case study: training a mother of the child with autism on how to provide discreet trail teaching internationally. *Journal of early childhood special education*, 4,95-103.

World Health Organization (2013). *Autism spectrum disorders & other developmental disorders: from raising awareness to building capacity*, Geneva, Switzerland. Retrieved from
http://HYPERLINK"http://apps.who.int/iris/bitstream/10665/103312/1/9789241506618_eng.pdf

Psychological and Pedagogical Support of Inclusion in Higher School as an Aspect of Supplementary Professional Education of Academic Staff

Leonid V. Blinov,

Lubov N. Blinova,

Pacific National University,

Khabarovsk Krai, Russia

Inna A. Makarova,

Olga E. Shafranova,

Amur State University,

Blagoveshchensk, Amur Oblast, Russia

(**editor11@academicpapers.org**)

Abstract

The paper deals with the issues of psychological and pedagogical support of the academic staff working with students with disabilities in the context of inclusive education. The relevance of the research is due to the difficulties in implementing the inclusive approach in Russian higher schools and need to train academic staff in working with students with special needs. Interviewing and rating academic staff members, (120 persons,) have revealed difficulties (philosophic-worldview, project-technological, and psychological-pedagogic) they face when teaching students with disabilities. The resource of further education can be used to overcome the revealed obstacles. Based on the example of teaching according to a specially designed program for further training, it has been shown that it helps to form relevant

competencies and preparedness to work with students with disabilities.. The paper may be useful for higher school managers and academic staff and teachers in intermediate vocational education establishments who work in a climate of inclusion as well as for specialists engaged in supplementary professional education.

Keywords: *academic staff; inclusion; further training; psychological-pedagogical support; inclusive environment; inclusive education; inclusive approach; professional competences*

Introduction

The equity of all people implies, among other things, equal educational opportunities. In this respect, one of the priorities of Russia's social policy is to modernize education to raise its quality and make it available for all the citizens. This goal can be achieved by enlarging the inclusive practice, which promises variability and flexibility in teaching people, (The decree of the RF government, 2012), who have disabilities or special needs. The higher school education of these students is particularly challenging, since few universities in Russia have created special conditions, and the experience of such education is limited.

At the same time, the RF President V. V. Putin assumes that the higher school can make a significant contribution to the establishment of inclusive practice. In the National Performance Strategy of the Actions for Children for the period of 2012–2017 (The decree of the RF President, 2012), he stressed the need for creation of the training and retraining system for the specialists working with children with disabilities and people with special needs on the basis of the higher school.

Correct understanding of the meaningful content of psychological and pedagogical support of all the participants. This important social task determined the relevance of the study. It aims, on the

one hand, at summarizing difficulties in teaching special students (students with disabilities and students with special needs) and finding ways to overcome them, and, on the other hand, at presenting the experience of the psychological and pedagogical support of the academic staff under the conditions of inclusion to provide that would ensure the quality of the inclusive education.

The hypothesis of the study is as follows: the academic staff can develop its professional competences for psychological-pedagogical support of students with special educational needs after the further training within the framework of supplementary professional education based on their experience. The methodological bases for the study were key principles of humanism and humanistic psychology (people's equity and intrinsic value, recognition of the right of every person for the development, self-realization, meeting socio-cultural needs, and a full life in society). Note that the notion of inclusion has various interpretations in both foreign and Russian literature.

Foreign studies by R. Jackson (2008), A. Renzaglia (1997), D. L. Ryndak (Ryndak et al., 2000), Y. Shemesh (2009), D. Voltz (2001), and others view the inclusion in different ways:

- as a recognition of the idea that every child is unique and valuable to society and educational establishments (A World Bank Report, 2003; Jackson, 2008);

- as a common educational environment (Hargreaves and Fullan, 1992; Renzaglia, 1997; Ryndak et al., 2000);

- as a process and practice of training, education, and support of people with special needs (Sugrue, 1997; Voltz, 2001; Mujis et al., 2004; Shemesh, 2009).

Among the Russian authors thoroughly dealing with the issues of inclusive education are L. I. Aksenova, S. V. Alekhina (Alekhina et al., 2011), I. M. Bgazhnokova, L. N. Blinova (Blinova and Karynbaeva, 2014; Blinova, 2015), N. N. Malofeev (2009), N. M. Nazarova (2010),

M. M. Semago, N. Ya. Semago, M. L. Semenovich (Semago et al., 2011), and others. Based on their investigations, one should treat inclusion as the educational process taking place in a common space and providing an opportunity for obtaining a degree for various students, including these with special educational needs if special conditions for their education are created.

The issues of inclusive practice receive sufficient attention. In their works, O. A. Zinevich, V. V. Degtyareva, and T. N. Degtyareva consider self-identity of people with special educational needs as a condition for successful professional orientation and choice of a field of study in higher school (Zinevich et al., 2016). The development of the inclusive environment in higher school is the subject of the researches by E. V. Golub and I. S. Saprykin (Golub and Saprykin, 2015). Yu. A. Kalgin (2011) discusses modern issues of psychological and pedagogical support of disabled persons in higher school. The issues of the creation of inclusive educational environment are considered in the works of R. V. Andreeva (2016), E. I. Konanova (2015), and E. A. Martynova (2015). They analyse the approaches to elaboration of adapted educational programs for students with special needs and disabled students. The experience of development of the inclusion in higher school in Russia and abroad is represented in the publications of M. V. Bersenev, V. I. Zinovyeva, M. Yu. Kim, O. E. Radchenko (Zinovyeva and Bersenev, 2012; Zinovyeva et al., 2010). However, the issues of the readiness of higher school academic staff for working with special students are still ignored by researchers. A preliminary pilot study has shown that the academic staff of higher school and teachers of secondary education establishments are less ready to implement inclusion as compared to pedagogues from general education organizations (Chernysheva and Denisova (Eds.), 2013; Makarova, 2013; Blinova and Karynbaeva, 2014; Blinova, 2015; Platonova et al., 2016). Besides, it is important to evaluate not only potential and readiness of academic staff to work in a climate of inclusion, but also possible

resources of the higher school from the viewpoint of psychological and pedagogical support of special students. In this regard, the Amur State University (Blagoveshchensk, Russia) became a basis for the research.

Materials and methods

Pursuant to the hypothesis of the study, the goals and stages (I, II, III) were defined.

Stage I (diagnostic). At this stage, we have set the following goals: a) to reveal (systematize) difficulties and barriers emerging in the interaction with students with special educational needs within a framework of inclusive educational process; b) to generalize the experience of psychological and pedagogic support of special students in the climate of the higher school and intermediate vocational education.

To achieve this goal, the method of qualitative survey in focus groups consisting of academic staff was applied. The method was chosen because a focus group enables to reveal a range of opinions on the issue under study, analyse the behaviour of educational process participants, and interpret it. The scenario involved the discussion of three thematic groups: difficulties faced by the members of a focus group in the interaction with the students with special needs students with disabilities (1); barriers of teaching in a climate of inclusion (2); degree of success in teaching students with special educational needs, evaluation of the level of one's competence in teaching them (3).

The terms of survey:

(1) The survey involved several respondents gathered in one place.

(2) The members of the focus group were encouraged to interact.

(3) A professional moderator followed the scenario and supported the discussion in compliance with the goals defined at the preliminary stage. However, the participants

were given an opportunity to speak spontaneously, and thus group dynamics were provided. The academic staff (n=120) was divided into 12 groups. The sessions lasted for 1–1.5 hours.

The scenario consisted of the following components:

(1) Presentation of the goals of the meeting and the group structure.

(2) Brief introductory remarks (topic of the discussion, its time limit and instructions for participants).

(3) Initial stage. Acquaintance with each respondent and outlining of the general points.

(4) Discussion on the main subject.

(5) Specific discussion on the inclusion in Amur State University.

(6) Final part. A review of the expressed opinions, supplementary investigation of opinions on some topics. Gratitude for the work.

(7) In addition to the above elements of scenario, appropriate stimuli were used: videos, interviews, and analysis of statistics.

Stage II (development of professional competences). At this stage, the academic staff training was organized using the resource of supplementary (corporate) further training aimed at developing professionalism in the field of organization and realization of inclusive education.

The topic of the first training program was defined as "Psychological and pedagogical support of the inclusive educational process (in a climate of higher education and intermediate vocational education)" (program manager I. A. Makarova). The goal of the further training program was to elaborate the system of scientific representations of inclusive education in trainees and develop professional competences of psychological and pedagogical support of students in case of inclusion. The training curriculum of this program is represented in Table 1.

Table 1. The topical education plan of the further training program

No.	Name of sections (models) and topics	TOTAL, hours	Including		
			Lectures	Practical classes / laboratory work	Students' individual work
1.	**Regulatory and axiological foundations of the inclusive education**	**44**	**8**	**12**	**24**
1.1.	The inclusive education in a modern world. The framework of categories and concepts of the inclusive education	12	2	4	6
1.2.	Regulatory base of inclusive education in the context of international and Russian norms	10	2	2	6
1.3.	A sociocultural aspect of establishment and development of national systems of special education. Analysis of integration models	12	2	4	6
1.4.	Socialization of people with special needs as a goal of inclusive education. The uniform concept of the Special Federal State Standard for People with Special Needs: basic provisions	10	2	2	6
2.	**Psychological and pedagogical characteristics and support of the subjects of inclusive education**	**56**	**16**	**14**	**26**
2.1.	Theoretical bases of arranging the psychological-	10	4	2	4

	pedagogical support of people with special needs				
2.2.	Psychological and pedagogical peculiarities of children, adolescents, and youth with special needs. General and specific peculiarities of children with deviations in development. Pedagogical characteristics of students in the inclusive educational environment. The peculiarities of the worldview of persons with impaired development	16	4	4	8
2.3.	Requirements for the resource provision (conditions) of inclusive education	14	4	4	6
2.4.	Creation of conditions for supporting and enforcing health of students with special needs in process of training	10	2	2	6
2.5.	Conflict prevention in the inclusive educational environment	6	2	2	2
3.	**Projecting of individual educational programs and routes for people with special needs in the inclusive education**	**24**	**4**	**8**	**12**
3.1.	Projecting of individual educational routes and professional careers of people with special needs	12	2	4	6
3.2.	Individual approach in	12	2	4	6

	working with special students				
4.	**Psychological and pedagogical bases of elaborating the professional culture of a pedagogue of inclusive education**	**20**	**4**	**4**	**12**
4.1.	Axiological priorities in the activity of pedagogues of inclusive education	10	2	2	6
4.2.	Professional competence of a pedagogue of inclusive education	10	2	2	6
	Total	**144**	**32**	**38**	**74**

The program contains four sections, each of which implies the combination of various forms of work. As evaluation funds, abstracts, inclusive environment modelling, presentations of the experience in the inclusive education of special students, and essays writing were used.

Efficiency of the mastering of the further training program content and elaboration of the competences of academic staff in psychological and pedagogical support were evaluated during defending project works on the following topics:

(1) Modelling of the educational space of a university: inclusive approach.

(2) Models of psychological and pedagogical support of students with special needs in a higher education establishment.

(3) Modelling of psychological and pedagogical support of students with special needs in an intermediate vocational education establishment.

(4) Utilization of the resource of upbringing work in the educational inclusion in higher education and intermediate vocal education.

(5) Tutor support of inclusion: approaches, resources, areas of activities.

(6) Evaluation of the efficiency of inclusive educational process of a university (college).

(7) Strategy of elaborating individual educational routes for students with special needs.

(8) Evaluation of social adaptation of students with special needs in the educational environment of a university (college).

(9) Individual tasks and methods of their use to control residual knowledge and current performance of students with special needs.

(10) Students' group work under conditions of inclusion: discipline case study.

(11) Introduction of inclusive education in the educational system of the higher school and intermediate vocational education.

(12) Job profile diagram of a pedagogue of inclusive education.

(13) Consulting parents on the adaptation of a special student to the conditions of inclusive education.

(14) Risks of inclusive education and ways to overcome them.

Stage III (control). The goal of this stage was to evaluate effectiveness of the work on the development of scientific representations of the inclusive education and development of professional competences of students' psychological and pedagogical support in the context of inclusion.

The final questioning involved all the members of focus groups who attended further training (n=120). It consisted of two parts and implied: a) CASE-interview consisting of 10 questions; b) self-evaluation of the developed competences.

The final questioning, part a). In the evaluation of the CASE-interview results, a type of reference was assessed. It shows how professors' opinion correlates to their behaviour in case of decision making and choosing a strategy of actions (Baws et al., 2009). The inclusive type of

reference is associated with the rights and freedoms of students with special needs. It is based on a clear-cut system of value references of a professor's axiological sphere in the worldview aspect. Anti-inclusive orientation implies a purely formal approach to teaching. It focuses on his or her own attitude, which is usually intolerant and discriminative. Possible orientation on socially approved variants of an answer and mixed reference were also taken into account.

The questions of the CASE-interview

A student chooses an individual training schedule if he or she needs more time for learning material and fulfilling tasks, more time for filing individual accounts, more individual consultations, and an opportunity to take his examinations individually. Which factor is the most significant for you as a professor? Provide your arguments.

How do you know that it is difficult for a student to communicate and overcome communicative barriers? Provide your arguments.

What is more important in communication with special students — verbal or non-verbal behaviour? Provide your arguments.

How do you know that there are students with special educational needs in the group? Provide your arguments.

How do you make sure that all the information you give to students within the framework of teaching your discipline is available for special students and given in convenient mediums?

What will you do if a student addresses to the dean's office complaining of the discriminative attitude in your classes? Justify the sequence of your actions.

Respond to the complaint of a student with special needs: "You are unreasonably prejudicial to me…"

Give as many ways to stimulate students with special educational needs to get rid of fear of individual report in the learning group as possible.

Performance of a student with special educational needs has fallen off badly, not only in your classes. How will you explain the reasons? Provide your arguments.

Provide as many ways for professors to promote the idea of tolerance to special students (disabled, people with special health needs) as possible.

The final questioning, part b). Self-evaluation was associated only with the professional competences that would determine implementation of the educational process. Professors evaluated their competence in creating an individual training schedule and its implementation, comprehending the tasks of rehabilitation registered in the individual rehabilitation card of a disabled student, involving students in various learning and extra-curricular activities, etc.

Results

Based on the results, three groups of difficulties have been revealed: philosophic-worldview (30%), projective-technological (40%), and psychological and pedagogical (30%). These difficulties, which actually are barriers for introducing inclusion from professors as organizers of the education process, have been most thoroughly worked on within the further training program. It is impossible to use the model of the complete inclusion without addressing them.

Further questioning of the professors and their evaluation of their competences at the third stage of the study made it possible to conclude that the professors' competence for psychological and pedagogical support of inclusive education had been essentially developed. The trainees reported that they were ready to account for students' special educational needs during the organization of educational process (70%); they understood how to adapt educational process (educational programs, academic load, schedule of classes' attendance, procedure of passing exams) (80%); they were ready to create or provide compensatory conditions of study to meet special educational needs (60 %); they were going to provide adequate participation of students

in the educational process and extra-curriculum activities (50%), and provide a corporate interaction in the psychological and pedagogical support of students with special needs (55%).

The types of references evaluated as scales, have been identified: inclusive (85%); anti-inclusive (10%); mixed (5%).

Discussion

The philosophic-worldview difficulties of professors (40%) are associated with the failure to understand the very essence of inclusive approach, its philosophy, and key differences of inclusion from the traditional forms of education. For 19.2% of pedagogues, a student with special needs is associated with a special social status of a student with disability and inability or extremely poor ability to follow the programs of intermediate professional or higher education.

Particularly noteworthy are the professors' difficulties associated with the lack of skills of projecting education material in the context of inclusion, didactic projecting of education process for co-education of ordinary students and students with special needs, using special technologies in education and technologies of building pedagogical interaction with all the subjects of inclusive educational process (75%).

Psychological and pedagogical difficulties are caused by insufficient psychological and pedagogical competence. The professors admit that they are not well aware of the physical and mental abilities of the students with special needs (53.3%) and are out of touch with special methods of work with students with impaired hearing, vision, speech, locomotor apparatus, emotional-volitional sphere, and more complicated combined defects (81.6%). Generally, this results in a situation when the pedagogical technologies and organizational-methodical provision of educational process obviously do not meet the biological, social, and psychological peculiarities of people with special needs and their special educational needs. Almost 25% of

professors underestimate the resource of inclusive environment in the development of personality and social behaviour of both special and ordinary students.

The knowledge of pedagogues in both special and developmental psychology appeared to be insufficient (45%). This limits the ability of special students in satisfying their basic need for open personal communication between students and pedagogues and causes the feeling of psychological insecurity in their interpersonal relations. Thus, the strategy of interpersonal interrelations cannot have a positive impact on the worldview positions of the student as participants of the educational process, change their mind-sets, and reduce the level of personal victimhood in the "person — environment" system (Fominykh, 2012).

Generalized experience of working with special students has shown that most professors rely on their intuition and try to find the best ways to include the students in the education process themselves (60%). The professors offered such students individual tasks and often gave more time for preparation. Still, the situation when the impairment in students' development did not become a reason for changing the structure of tasks or periods for performing the tasks was widespread, too. Besides, conflict situations were registered. It is telling that sometimes the professor took an acoustic apparatus for a prohibited earbud, or deterioration of health during the examination for attempts to seek pity and thus heighten examination score. Moreover, the interaction with students was not quite correct, which affected their self-esteem and psychological state.

In the light of the foregoing, one can conclude that the academic staff needs psychological and pedagogical support in its professional activity and specialized training based on the resources of supplementary professional education at a corporate level. Some phenomena have been discovered: the effective experience of teaching does not guarantee that a professor will find necessary technologies in teaching special students himself and apply the technologies

successfully; professors' attitudes often make it difficult for them to communicate with special students, which leads to their discrimination and underestimation. When organizing an educational process for special students, their opportunities and abilities should be taken into account. The positive experience of creating an educational process indicates that such practice should be extended and special competences should be developed. Taking into account peculiarities of the post-technocratic model of supplementary professional education, the educational process within the further training program was arranged with a focus on the current professional difficulties (Shafranova, 2014). In this regard, much attention was given to the development of general professional activities of professors, such as ability to exercise students' rights in practice; create conditions for their proper learning as well as interaction and communication with all the other subjects of educational process; participate in creating psychologically comfortable and secure educational environment in the professional educational organization; raise the level of psychological competence of the participants of the educational process; apply health saving technologies in the professional activities; observe the compliance with the ethical rules of the profession, etc.

Specific attention was given to the development of special professional activities through elaborating tolerant attitude to special students and reflection on empathic interaction with them; improved awareness of theoretical-methodological bases of inclusive education and its conceptual and categorical framework; elaboration of individual education plans, adapted programs and learning kits for students with special needs; organization of various forms of training sessions. The skills of interaction with all the participants of inclusive environment and creation of psychologically comfortable conditions for them to optimize social-rehabilitation events are important too (Zeer, 2003). It should be noted that similar views on the development

of general and special professional activities of pedagogues associated with professional training are described in the works of other authors (Slyusarev, 1992; Martynova, 2015).

During theoretical training within the further training program, the following theoretical methods were applied: systematization of scientific notions and provisions to determine the essence of the problem; empirical methods of collecting information about the state of the object under study (pedagogical supervision, investigational interview, psychological tests, sociometric methods, techniques focused on studying social position, analysis of documents) (Bordovskiy , et al. , (Eds.), 2005).

The number of traditional lectures and seminars was minimal; most practical classes were devoted to project works. Such reflexive-active form of organizing practical classes allowed participants to "live" a certain stage of projecting psychological-pedagogical support in the framework of each section and work on the project independently at their own pace and according to their own individual educational trajectory. Mastering each section of the program implies obtaining a certain product, which is, on the one hand, a component of a final product, and on the other hand, the result of the development of competences, which indicate the processes of professors' self-development and self-education. The arrangement of the education process as a way to produce sense and understanding acts as a kind of guarantee for the transformation of another person's into "one's own another person's" (Bakhtin, 1986, pp. 381–393, 429–432) to provide the understanding of the essence of psychological and pedagogical support of inclusion. In order to ensure the understanding of educational process by an organizer, one should work not only with the meaning of some element of the education content, but also with its sense, linking it with the social experience of a learner — his or her knowledge, skills, emotions, values, etc. (Kraevskiy, 2009). Thus, the accents were intentionally shifted to self-

education activities and more intensive workout of scientific-methodical provision on inclusive practice.

It is noteworthy that the offered program of further education is based on the idea of psychological and pedagogical support being a comprehensive and system activity, which involves the creation of social-psychological and pedagogical conditions for successful education and development of each student in the educational environment. The practice shows that special students need assistance in independent coping with difficulties during their professional development (Piskun, 2009). In this sense, the psychological and pedagogical support is an applied area in training specialists. It provides and facilitates the process of learning fundamental theoretic and applied competences; besides, it ensures their better mastering. In this context, the understanding of support offered by E. F. Zeer seems to be the most appropriate; here, it is treated as the assistance to an individual in elaborating orientation field of development, where he or she takes the responsibility for his or her actions (Zeer, 2003; Zeer and Popova, 2015). However, it is important to understand that the professors that conduct psychological and pedagogical support are not obliged to give a supported person a readymade solution of problems, or make a choice for him or her, etc. This leads to the stimulation of individual responsibility for the quality of one's academic and practical training, while responsible attitude to one's self-development enables special students to adopt an active subject position more quickly. Using the terms of T. V. Meng, educational space becomes "subjectized" (Meng, 2011). Still, the environmental approach plays an important role in the inclusive practice. Its main methodological line is the management of establishment and development of a student's personality mediated by the environment. A positive (from pedagogical viewpoint) environment creates conditions for elaborating and fixing a certain positive lifestyle (Manuylov, 2002; Plugina et al., 2012; Makarova, 2013). The inclusive educational environment gives a special student

necessary information, data, knowledge, etc., while the ability to get and transform information is acquired during learning. Potentials of the environment determine the evaluation of its qualities. Therefore, the inclusive educational environment can be evaluated from the positions of completeness and variety of the means (potential, resources) that it offers for education, research, organization, and scientific-methodical activities.

Therefore, psychological and pedagogical support unfolds within a framework of a person-centred and environmental approach.

This study confirmed the proposed hypothesis about the successful development of professional competences necessary in psychological and pedagogical support of students with special educational needs using the further training of academic staff within a framework of supplementary professional education with account for their working experience.

The program offered for further training can be applied in the practical activity of higher or intermediate vocational education to enlarge the competences of academic staff in the psychological and pedagogical support of students with special needs.

Conclusions

1.   The difficulties revealed and barriers encountered by academic staff can be provisionally classified into three groups: philosophic and worldview, projective and technological, and psychological and pedagogical. They make the integration with special students much more difficult and reduce the quality of education. The condition of inclusive referencing is the acceptance of inclusive education ideas.

2.   Various teaching experience does not guarantee that the required technologies and approaches to teaching special students will be applied efficiently. Besides, it does not guarantee that the educational needs of special students will be met. The academic staff needs its professional competences aimed at providing the inclusive educational process to be

supplemented and developed. In fact, academic staff needs psychological and pedagogic support in the transition to working in new situation of inclusion. They face difficulties mostly in the adaptation of educational programs, planning of individual educational routes, application of special technologies for teaching and creation of efficient education.

3.   The resource of supplementary professional education is efficient for the development of academic staff competences, if a further training program focuses on addressing basic difficulties at the stage of inclusion introduction. Various forms of work within a framework of corporate further training contribute to the creation of an inclusive education environment and development of the inclusive educational process. The resource of supplementary professional education makes it possible to have a subtle perception of the development of academic staff competences, ensuring specialists' readiness to work in the situation of inclusion.

References:

ALEKHINA, S. V., ALEKSEEVA, M. A., AND AGAFONOVA, E. L. (2011). Gotovnost pedagogov kak osnovnoy faktor uspeshnosti inklyuzivnogo protsessa v obrazovanii [Pegagogues's readiness as the key factor of the success of the inclusive process in Education]. *Psikhologicheskaya Nauka i Osavebrazovanie, 1*, 83–92.

ANDREEVA, R. V. (2016). Razvitie inklyuzivnogo obrazovaniya v vuze [Development of the inclusive education in the university]. *Juvenis scientia,* 1, 41–42.

A World Bank Report. (2003). Lifelong learning in the global knowledge economy: Challenges for developing countries. Washington, DC: The World Bank.

BAKHTIN, M. M. (1986). *Estetika slovesnogo tvorchestva* [The Aesthetic of Verbal Creation]. (2nd ed.). Moscow: Iskusstvo.

BAWS, R., BYNOW, D., AND SHL TEAM. (2009). *Metody provedeniya intervyu, intervyu po kompetentsiyam* [Methods of interviewing. Interviewing by competences]. (V. LOMAKIN, Trans.). [Russian translation of Baws, Rebecca. Hiring the Best, Terminating the Rest. London, 2008]. Moscow: Hippo, 2009.

BLINOVA, L. N. (2015). Professionalno-lichnostnaya gotovnost pedagogov kak uslovie realizatsii FGOS dlya detey s OVZ [Pedagogues' professional and personal readiness as a condition for realization of the Federal State Educational Standards for children with special needs]. In O. G. PRIKHODKO and I. L. SOLOVYEVA (Eds.), *Osobye deti v obshchestve. Sbornik nauchnykh dokladov i tezisov vystupleniy uchastnikov I Vserossiyskogo sezda defektologov. 26–28 oktyabrya 2015 g.* [Special children in the society: Collection of scientific reports and abstracts of the participants of the 1st All-Russian meeting of special education teachers. 26–28 October, 2015] (pp. 19–24). Moscow: Independent non-profit organization "Research guidance centre 'Suvag'".

BLINOVA, L. N., AND KARYNBAEVA, O. V. (2014). Formirovanie inklyuzivnoy kompetentsii u pedagogov obrazovatelnykh uchrezhdeniy [Development of inclusive competence in the pedagogues of educational establishments]. *Kazanskaya nauka, 11*, 211–213.

BORDOVSKIY, G. A., RADIONOVA, N. F., AND TRYAPITSINA, A. V. (Eds.) (2010). *Razrabotka programm podgotovki professorsko-prepodavatelskogo sostava k proektirovaniyu obrazovatelnogo protsessa v kontekste kompetentnostnogo podkhoda* [Elaborating the programs for training the academic staff for projecting educational process in the context of competence approach]. St. Petersburg: A. I. Herzen State Pedagogical University of Russia Press.

CHERNYSHEVA, A. V., AND DENISOVA, R. R. (Eds.) (2013). *Aktualnost razvitiya inklyuzivnogo obrazovaniya v Amurskoy oblasti: materialy mezhregionalnoy nauchno-prakticheskoy konferentsii 18 aprelya 2013 goda* [The Relevance of Developing Inclusive Education in the Amur Oblast: Proceedings of the interregional research and practical conference of April 18, 2013]. Blagoveshchensk: Institute of Developing Education of the Amur Oblast Press.

FOMINYKH, E. S. (2010). Narusheniya lichnostnykh granits studenta-invalida v kontekste ego viktimnoy deformatsii [Violation of personal borders of a disabled student in the context of his victim deformation]. *Izvestiya Volgogradskogo gosudarstvennogo pedagogicheskogo universiteta, 1*, 122–125.

GOLUB, E. V., AND SAPRYKIN, I. S. (2015). Inklyuzivnoe obrazovanie v vysshykh uchebnykh zavedeniyakh Rossii: problemy i resheniya [Inclusive education in higher education establishments in Russia: Problems and solutions]. *Povolzhskiy pedagogicheskiy vestnik, 4*(9), 109–114.

HARGREAVES, A., AND FULLAN, M. G. (1992). Introduction. In A. HARGREAVES AND M. G. FULLAN (Eds.), *Understanding teacher development* (pp. 1–17). New York: Teachers College Press.

JACKSON, R. (2008). Inclusion or segregation for children with an intellectual impairment: What does the research say? Retrieved from: http://disability-studies.leeds.ac.uk/files/library/Jackson-Inclusion-Seg1.pdf.

KALGIN, YU. A. (2011). Sovremennye podkhody k formirovaniyu psikhologo-pedagogicheskogo soprovozhdeniya inklyuzivnogo obrazovaniya invalidov v vyze [Modern approaches to the development of the psychological-pedagogic support of the inclusive education of disabled people in the university]. *Vestnik Moskovskogo Gosudarstvennogo Lingvisticheskogo Universiteta, 622*, 119–132.

KONANOVA, E. I. (2015). Organizatsiya inkluzivnogo obrazovatelnogo prostranstva v vuzakh Rossii dlya uchashchikhsya s ogranichennymi vozmozhnostyami zdorovya [Organization of inclusive educational space in Russian universities for students with special needs]. *Kontsept, 8*, 136–140.

KRAEVSKIY, V. V. (2009). *Missiya pedagogicheskogo soobshchestva v demokraticheskom gosudarstve* [Mission of pedagogical community in a democratic state]. In A. V. KHUTORSKOY (Ed.), Innovatsii v obrazovanii: chelovekosoobraznyy rakurs: sbor. nauchn. trudov. [Innovations in education: A man-compatible perspective: Collection of scientific works] (pp. 21–24). Moscow: Eydos.

MAKAROVA, I. A. (2013). Povyshenie kvalifikatsii pedagogicheskikh kadrov pri perekhode obshcheobrazovatelnykh uchrezhdeniy k rabote v usloviyakh inklyuzii [Further training of pedagogical staff during the transition of general education establishments to working under conditions of inclusion]. *Nauchnoe obespechenie sistemy povysheniya kvalifikatsii kadrov, 2*(15), 18–25.

MALOFEEV, N. N. (2009) Inklyuzivnoe obrazovanie v kontekste sovremennoy sotsialnoy politiki [Inclusive education in the context of modern social policy]. *Vospitanie i obuchenie detey s narusheniyami razvitiya, 6*, 3–10.

MANUYLOV, YU. S. (2002). Sredovoy podkhod v vospitanii [Environmental approach in education]. Moscow; Nizhny Novgorod: University of the Russian Academy of Education.

MARTYNOVA, E. A. (2014). Struktura i soderzhanie adaptirovannykh obrazovatelnykh programm vysshego obrazovaniya dlya lits s ogranichennymi vozmozhnostyami zdorovya i invalidov [The structure and content of the adapted educational programs of the higher education for individuals with special needs and disabilities]. *Sovremennye problemy nauki i obrazovaniya, 4*, 271.

MENG, T. V. (2011). *Tekhnologiya konstruirovaniya lokalnykh obrazovatelnykh sred v deyatelnosti prepodavateley vysshey shkoly* [Technology of constructing local educational environments in the activity of high school teachers]. In N. F. RADIONOVA et al. (Eds.), *Pedagogicheskoe obrazovanie v perekhodnyy period: rezultaty*

issledovaniy 2010 goda: Sbornik statey po materialam vnutrivuzovskoy nauchnoy konferentsii, 2 marta 2011 goda [Pedagogical education in the transient period: Results of the 2010 studies: Collection of articles based on the reports of the university research conference. 2 March, 2011] (pp. 286–294). St. Petersburg: Lema.

MUIJS, D., HAVRIS, A., AND LINDSAY, G. (2004). Evaluating CPD: An overview. In B. DAY AND J. SACHS (Eds.), *International handbook on the continuing professional development of teachers* (pp. 149–175). Berkshire, UK: McGraw-Hill Education.

NAZAROVA, N. M. (2010). Integrirovannoe (inklyuzivnoe) obrazovanie: genezis i problemy vnedreniya [Integrated (inclusive) education: Genesis and challenges of implementation]. *Sotsialnaya pedagogika, 1*, 77–87.

PISKUN, O. YU. (2009). Opyt i perspektivy inklyuzii v usloviyakh srednego i vysshego obrazovaniya [Experience and perspectives of inclusion under the conditions of secondary and higher education]. *Mezhdunarodnyy zhurnal prikladnykh i fundamentalnykh issledovaniy,* 5, 111–113.

PLATONOVA, R., LAZAREVA, L., PECHENYUK, A., POLICHKA, A., IKONNIKOV, A., SEMENOVA, N., Dvoryankina, E., Blinov, L., and Bastrikov, A. (2016). Didactic possibilities of formation of university students professionally significant personal qualities. *International Review of Management and Marketing, 6*(2), 92–96.

PLUGINA, M. I., KOZLOVSKAYA, G. YU., AND BOROZINETS, N. M. (2012). Rol akmeologicheskoy sredy v formirovanii inklyuzivnoy kompetentnosti pedagogicheskikh kadrov [The role of acmeological environment in the elaboration of inclusive competence of pedagogical staff]. *Vestnik Cherepovetskogo gosudarstvennogo universiteta*. *Psychological Sciences, 4*(43-2), 149–153.

RENZAGLIA, A. (1997). The impact of teacher education on the beliefs, attitudes, and dispositions of preservice special educators. *Teacher Education and Special Education, 20*, 360–377.

RYNDAK, D. L., JACKSON, L. AND BILLINGSLEY, F. (2000). Defining school inclusion for students with moderate to severe disabilities: What do experts say? *Exceptionality, 8*(2), 101–116.

SEMAGO, N. YA., SEMAGO, M. M., SEMENOVICH, M. L., DMITRIEVA, T. P., AND AVERINA, I. E. (2011). Inklyuzivnoe obrazovanie kak pervyy etap na puti k vklyuchaemomu obshchestvu [Inclusive education as the first step on the way to inclusive society]. *Psikhologicheskaya nauka i obrazovanie, 1*, 51–59.

SHAFRANOVA, O. E. (2014). Sushchnostnye osnovaniya postroeniya nepreryvnogo obrazovaniya professionala [Essential bases for the development of continuous education of a professional]. *Mir nauki, kultury, obrazovaniya, 1*(44), 66–68.

SHEMESH, Y. R. (2009). "I get by with a little help from my friends": A survey of teachers' perceptions of administrative support and their attitudes toward inclusion in New Jersey. PhD thesis. Rutgers University. Graduate School of Applied and Professional Psychology, New Brunswick, New Jersey.

SLYUSAREV, YU. V. (1992). Psikhologicheskoe soprovozhdenie kak faktor aktivizatsii samorazvitiya lichnosti [Psychological support as a factor of activating the self-development of the personality]. Author's abstract of a PhD thesis. St. Petersburg state university, St. Petersburg.

SUGRUE, C. (2004). Rhetorics and realities of CPD across Europe: From cacophony towards coherence? In C. DAY AND J. SACHS (Eds.), *International handbook on the continuing professional development of teachers* (pp. 67–93). Maidenhead: Open University Press.

The decree of the RF Government of 26 November 2012 No. 2181-p "On the Establishment of State Program 'Available environment' for the period of 2011–2015". Retrieved from: http://base.garant.ru/70269216/#ixzz3TWXQCwau.

The decree of the RF President of 1 June 2012 No. 761 "On the National Performance Strategy of the Actions for Children for the period of 2012–2017". Retrieved from: http://www.consultant.ru/document/cons_doc_LAW_130516/.

VOLTZ, D. L. (2001). What matters most in inclusive education: A practical guide for moving forward. *Intervention in School and Clinic, 37*(1), 23–30.

ZEER, E. F. (2003). Psikhologiya professionalnogo obrazovaniya [Psychology of vocational education]. Moscow: Moscow Psychological and Social Institute Press; Voronezh: MODEK.

ZEER, E. F., AND POPOVA, O. S. (2015). Psikhologicheskoe soprovozhdenie individualnykh obrazovatelnyh traektoriy obuchayushchikhsya v professionalnoy shkole [Psychological support of individual educational trajectories of the high school students]. *Obrazovanie i nauka, 4*(123), 88–99.

ZINEVICH, O. V., DEGTYAREVA, V. V., AND DEGTYAREVA, T. N. (2016). Inklyuzivnoe obrazovanie v rossiyskoy vysshey shkole: sovremennye vyzovy [Inclusive education in the Russian higher school: Modern challenges]. *Vlast, 5*, 61–67.

ZINOVYEVA, V. I., AND BERSENEV, M. V. (2012). Razvitie sistemy soprovozhdeniya studentov s ogranichennymi vozmozhnostyami zdorovya v vuzakh Shvetsii i Finlyandii [Development of the system for supporting students

with special needs in the universities of Sweden and Finland]. *Vestnik Tomskogo Gosudarstvennogo Universiteta. History, 1*(17), 176–179.

ZINOVYEVA, V. I., BERSENEV, M. V., KIM, M. YU., AND RADCHENKO, O. E. (2010). Razvitie idey inklyuzii v vysshem obrazovanii (rossiyskiy i mirovoy opyt) [Development of the ideas of inclusion in the higher education (Russian and world experience)]. *Vestnik Tomskogo Gosudarstvennogo Universiteta, 4*(12), 153–157.

Biographical notes

Leonid V. Blinov is a Professor at Pacific National University (Khabarovsk, Russia), head of the axiological scholar school of the Far East, his research interests include axiological principles of education and inclusion.

Lubov N. Blinova is an Associate Professor at Pacific National University (Khabarovsk, Russia), expert in inclusive education; her research interests include Psychology and Pedagogy for Special Needs, practice of students training in working in the framework of inclusive education

Inna A. Makarova is an Associate Professor at the Psychology and Pedagogy Department at Amur State University, her research interests include continuing professional education and methods of vocational training in psychological and pedagogical follow-up of students with special educational needs in case of inclusive education.

Olga E. Shafranova is a Dean of the Faculty of Additional Professional Education at Amur State University, her research interests include continuing professional education, theory and principles of the academic staff further training, in psychological and pedagogical follow-up of disabled students in case of inclusion.

Fostering Reading Comprehension of Learning Tasks with Pictorial Symbols:
A Qualitative Study of the Subjective Views and Reading Paths of Children with and without Special Needs

Anna Noll,
Jurgen Roth,
University of Koblenz-Landau,
Markus Scholz,
Ludwigsburg University of Education,
Germany

Abstract

How can barriers in reading be reduced? Adding symbols to assignments could be one possibility for enhancing readability and, therefore, providing students with poor reading skills with access to learning material. This qualitative interview and eye-tracking study aims to acquire a first insight into how students rate and perceive the addition of symbols to texts. Students with special educational needs (N = 6) and without special educational needs (N = 6) participated. All students worked on tasks that were designed as an introduction to fractions. The study shows that the participants rated the additional symbols positively and utilized them without a prior explanation. Furthermore, the symbols were mainly used by the students to gain a holistic understanding of the assignments.

Introduction

Written language is highly important in democratic societies. The ability to read is a precondition for social participation; for example, it is needed to obtain access to all kinds of information. Children with special needs often have difficulties with reading. Surveys from different countries and areas show that there are many children with physical, learning, cognitive or developmental disabilities who are not able to understand information presented in written language (Erickson & Geist, 2016; Scholz, Wagner, & Negwer, 2016). These students experience barriers in many areas. To reduce these barriers in school and society, access to written information must be facilitated.

Scholz, Dönges, Dechant, & Endres (2016) differentiate between three forms of making information more accessible: (1) text (linguistic) simplifications, that is, the use of easy-to-read language; (2) text augmentation using pictures (for example, pictorial symbols) to convey the meaning of certain words within a text to enhance understanding; (3) text substitution, which involves strategies that substitute the whole meaning of written language with videos or photographs depicting the whole meaning of a sentence or phrase. The first two approaches will be illustrated in the following paragraphs in more detail.

Information can be made more accessible by applying easy-to-read language. In this study, the German rule set for easy-to-read language (Netzwerk Leichte Sprache, 2006) is used. Easy-to-read language was established to facilitate understanding for people with disabilities in everyday life. It is used to simplify manifestos or newspapers in order to support participation in society. So far, the guidelines for easy-to-read language have not been verified scientifically. They show several similarities to empirically based linguistic simplification rules, such as the Hamburger Modell (Langer, Schulz von Thun, & Tausch, 2011) and refer to the word, sentence, text, and design levels. Concerning the word level, they specify that compound words should be written with a hyphen in order to make the word's structure easier to recognize for the reader. For example, the word "basketball" would be written as "basket-ball". The guidelines also emphasize that only one statement should be made per sentence. The sentence *Write down the fractions according to their size* would thus be replaced by the two sentences: *Write down the fractions. Start with the largest*. The easy-to-read guidelines furthermore stress the importance of personally addressing the reader and using a well-structured layout. For example, all words that build a meaningful unit should be written on one line. Of course, the described rules do not claim to be complete. They have a rather illustrative function as they show the benefits of this concrete and easily applicable set of guidelines.

Another possibility for enhancing readability is the use of symbols. According to Detheridge & Detheridge (2002), a symbol can be defined as a graphical image conveying a single idea or concept. This means that a symbol is usually linked to a single word. As pictorial symbols convey the same ideas as words, it can be assumed that they make texts more accessible for students who have difficulties with reading (Hurtado et al, 2014). Thus, the use of the word symbol in this study is different to the widespread idea of symbols as arbitrary signs (Schnotz, 2005).

Symbols can be divided into different categories (Detheridge & Detheridge, 2002). Transparent or guessable symbols possess an obvious connection to their referent. They usually represent nouns or verbs and show several similarities to the object or activity they refer to. The symbol for the word headphone is an example of this category (Figure 1). There are also translucent or learnable symbols. They are not immediately recognizable, but the link between the image and its referent can be relatively easy understood and remembered (Figure 1). In contrast to transparent and translucent symbols, opaque symbols need to be learned. Even though these symbols are created from elements that are connected with the object or idea, the reader needs some explanation of how the image relates to the meaning. The complexity of these symbols results from the more complex vocabulary base.

Headphone (transparent)   Write (translucent)   health (opaque)
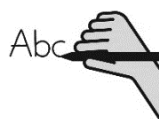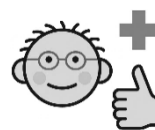
Figure 1. Examples of symbol categories

Note: The symbols are taken from the Metacom symbol system (Kitzinger, 2015).

The combination of both symbols and easy-to-read language is one possibility for making written information easier to access. Based on the integrated model of text and picture comprehension by Schnotz (2005) and the cognitive theory of multimedia learning by Mayer (2009), we expect symbols to have a positive influence. Both models assume that pictorial and verbal information is processed in two different channels in the brain. When both words and pictures are presented, both channels are used and the limited capacity of the working memory increases.

Empirical data on whether symbols facilitate the comprehension of texts are very limited, ambiguous, and influenced by a lot of factors (Southerland & Isherwood, 2016). Poncelas and Murphy (2007) found no statistically significant difference between the text comprehension of a political manifest which consisted of text and symbols, on the one hand, and the same political manifest with text only, on the other hand. Thirty-four adults with special needs participated in their study. They came to the conclusion that the meaning of pictorial symbols needs to be learned beforehand. Zentel (2010) also found no statistically significant advantage of adding symbols to texts. In contrast, Jones, Long, and Finlay (2007) proved that the reading comprehension of adults with special needs increases if symbols are added. According to them, especially participants with a low reading ability benefit from the addition of symbols. A qualitative study conducted by Scholz, Dönges, Risch, & Roth (2016) also supports the efficacy of symbols.

Generally, it can be stated that the samples of all of these studies were extremely small and, in addition, the participants were adults in all three studies (Poncelas & Murphy, 2007; Jones et al., 2007; Zentel, 2010). Furthermore, the studies focused only on the effectiveness of symbols and only marginally covered the question of how symbols are perceived. To understand how symbols are perceived by students with and without learning difficulties, we need to acquire an insight into the cognitive processing of symbols. This leads to the research questions of this project:

1. How do students with and without special needs rate symbols in learning material (e.g., concerning their helpfulness and fit)?
2. How do students with and without special needs perceive symbols used in learning materials (e.g., with regard to their influence on the reading process)?
3. Are students with and without special needs able to access symbols without a prior explanation?

Research Question 3 is clearly part of Research Questions 1 and 2. The reason for formulating a third research question about this specific aspect was to emphasize the fact that no introduction about how to use symbols is given. As we wanted to find out whether a prior explanation of the function and use of symbols is needed, we decided to formulate a third specific research question concerning this aspect.

Method
Participants

The participants of this study were students with and without special needs resulting from a learning disability. The term learning disability in Germany refers to an impairment of performance and learning behavior, especially with regard to school-based learning. Learning

disabilities are often accompanied by impairments in motoric, sensory, cognitive, linguistic as well as social and emotional abilities (KMK, 1999).

Twelve students with and without special needs (learning disability) from grades 5, 6, and 7 participated in this interview study (N = 12; M_{age} = 11.08; age range: 10-13 years; 50% female; cf. table 1). Additionally, the eye movements of four of these students (N = 4; M_{age} = 11.75; age range: 11-13; 75% female) were recorded while working on the exercises (Table 1).

Table 1. Participants

	Age	Grade	Sex	Special educational needs (SEN)	School form	Eye movements recorded
Student 1	12	5	Female	Without SEN	Secondary school	Yes
Student 2	11	5	Female	Without SEN	Inclusive School	Yes
Student 3	11	6	Female	With SEN	Special school	No
Student 4	13	6	Male	With SEN	Special school	Yes
Student 5	11	5	Female	With SEN	Inclusive school	No
Student 6	10	5	Male	Without SEN	Secondary school	No
Student 7	11	5	Female	With SEN	Inclusive school	Yes
Student 8	10	5	Male	Without SEN	Inclusive school	No
Student 9	12	7	Male	With SEN	Special school	No
Student 10	10	5	Male	Without SEN	Secondary school	No
Student 11	11	5	Male	Without SEN	Inclusive School	No
Student 12	11	6	Female	With SEN	Special School	No

Material

All students worked on tasks had the objective of introducing fractions in an activity-oriented manner with hands-on material. The written information utilized easy-to-read language augmented with pictorial symbols. The topic of fractions had not been covered in the students' mathematics classes beforehand. The subject was chosen because it had been intensively analyzed in German scientific literature (cf. Eichelmann, Narciss, Schnaubert, & Melis, 2012; Hefendehl-Hebeker, 1996; Malle, 2004; Pitkethly & Hunting, 1996; Padberg & Wartha, 2017; Schink, 2013; Winter, 1999). Thus, a sound theory-based introduction to fractions could be designed. Furthermore, fractions are considered to be a complex topic. The pupils need to develop new rational number concepts, as fractions differ from natural numbers in many aspects (Prediger, 2004; Siegler, Fazio, Bailey, & Zhou, 2013). Another reason for fractions' complexity is their multifaceted construct (Kieren, 1976).

After a first task complex, which aimed at familiarization with the material (Figure 2), the pupils received input about fractions by watching a video. This was followed by naming, marking, and sequencing fractions (Figure 3). To avoid spilt attention (Mayer, 2009), the symbols were always presented in close spatial proximity to the text (above the related words). We

assumed that transparent and translucent symbols would best foster understanding, as they are easier to recognize than abstract symbols. Therefore, only these kinds of symbols were added to the keywords of the assignments. A pilot study was conducted to test the comprehensibility of these symbols. The participating students translated the symbols' meaning. They developed the symbols' meaning in the context of reasonable sentences. Fourteen of the 30 symbols were identified correctly by more than 80% of the students. Ten symbols were recognized by between 50% and 70% of the students, and only six of the 30 used symbols were recognized by fewer than 50% of the students. These six were adapted for the study. The symbols used in this study belong to the Metacom 7 symbol set (Kitzinger, 2015). As symbols for mathematical contents are rare, some symbols were developed by the authors.

Figure 2. Example Task Complex 1
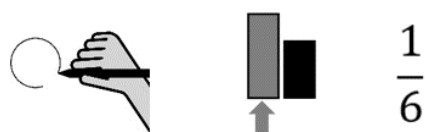
Figure 3. Example Task Complex 2

Data Source

After working on the tasks, all students participated in a structured interview. The interview dealt with the use of symbols (e.g., symbols' helpfulness and fit), the use of easy-to-read language (e.g., comprehensibility) as well as with the difficulty and the length of the exercises. The mean length of the individual interviews was approximately 18 minutes, with a range from 12 to 25 minutes. Each interview was video-taped and transcribed.

The tasks for the eye-tracking group were presented on a 22-inch screen with a 1366×768 pixels resolution using the hardware *The Eye Tribe Tracker PRO* and the software *EyeProof Recording Studio*. Every task was presented on a single page on the screen. While reading, the students sat at a distance of approximately 50 cm from the screen. The system was calibrated using an animated 9-point calibration image before every task. If the accuracy of the calibration was above 2 degrees of the visual angle, a new calibration automatically started. The mean accuracy of calibration was 0.35 degrees of the visual angle. The dynamic scanpath videos of every exercise of the four students (N = 67) made up the core data base of the eye-tracking analysis.

In addition to the interview and the eye tracking, the participants' general cognitive ability was assessed using part one (Subtest 1 to 4) of the CFT 20-R (Weiß & Weiß, 2006), which focuses on general fluid ability according to Cattell (1968). The participants' basal reading ability was captured using the German reading comprehension test SLS 2-9 (Wimmer & Mayringer, 2014) which emphasizes the comprehension of single sentence instead of complete text understanding.

Procedure

To avoid excessive demands on the participants, data collection was divided into two sessions. During the first session, paper-and-pencil versions of both tests (CFT 20-R and SLS 2-9) were implemented. During the second session the participants worked on the tasks individually, and the interview was conducted afterwards. For the four students who participated in the eye tracking, the second session also included the students' familiarization with the eye-tracking system, the procedure of calibration, and a short example exercise. This took approximately three minutes. To ensure the comparability of results, the content of the example exercise had nothing to do with fractions. The students in the eye-tracking condition, read the 17 tasks on screen. After reading each task on screen, the students received related hands-on materials and worked on the task with paper and pencil.

Data Analysis

The interview transcripts were evaluated using MAXQDA 11. To build categories, cycle methods (Saldana, 2009) orientated on the interview's structure were first used. A first coding cycle was followed by a second one. While the first cycle included elemental (structural as well as descriptive coding) and affective (evaluation coding) methods, the second cycle focused on coding patterns (ibid.). For example, in the first cycle, the category "symbols' helpfulness" consisted of the following codes:

1. Symbols are perceived as helpful.
2. Symbols are neither perceived as helpful nor as distracting.
3. Some symbols are perceived as helpful, some as distracting.
4. It is unclear whether the symbols are perceived as helpful or distracting.

These codes were formed deductively as well as inductively. In the second cycle these codes were identified as being of major importance for the study and were densified to form three levels of helpfulness. Furthermore, the answers that were assigned to Code 4 were analyzed again by referring back to the videos. The three levels of helpfulness formed the basis for the typology we developed (see Table 3).
The transcripts were coded by two raters and a Cohen's kappa (cf. Wirtz & Casper, 2002) of .75 was achieved in the first instance. Afterwards, not coincidently rated statements were discussed until the two raters came to an agreement. These communicatively validated results (cf. Kvale, 2007) are presented in the following chapter.

The calculation and visualization of the eye movements in scanpaths was based on a dispersion-based algorithm. This means that the dispersion (e.g., the spread distance) of fixation points in the eye-tracking protocols was emphasized by this algorithm. Furthermore, a dispersion-based algorithm uses duration information and is locally adaptive (Salvucci & Goldberg, 2000).

The development of the coding system was also based on techniques described by Saldana (2009). Most codes and categories were developed deductively; some were added inductively during the coding process. Every scanpath was coded and analyzed separately following the chronology of the reading process. This included reading the text as well as seeing the symbols. Two categories were differentiated in the coding process: the word and the sentence level. Each sentence was coded on both levels. The sentence level refers to the holistic observation of the task. This means that the student read every word of the assignment in one go without stopping. The student looked at the symbols (1) afterwards, (2) before, (3) afterwards and before, or (4) not at all. Each scanpath was coded according to when and whether the symbols were looked at using the following codes:

1. *Text-Symbols* (symbols were looked at after reading the assignment)
2. *Symbols- Text* (symbols were looked at before reading the assignment)
3. *Both* (symbols were looked at before and after reading the assignment)
4. *Text* (symbols were not looked at)

Figure 4 illustrates a scanpath screenshot, which was coded as *Text-Symbols* as the symbols were considered after reading only.
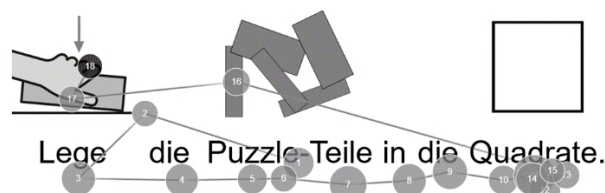
Figure 4. Scanpath coded as Text-Symbols

In addition to the sentence level, each scanpath was coded at the word level. Besides the holistic observation of the assignments, participants looked at single words and the corresponding pictures. Figure 5 shows a scanpath screenshot which was coded as *both* at the sentence level, as the symbols were viewed before and after reading. Additionally, the scanpath was coded as *transition* at the word level, because of the transition between the first word circle (German: umkreise) and the corresponding symbol.
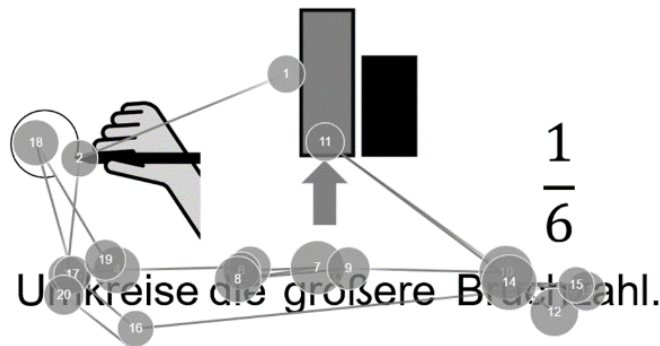
Again, two raters coded the scanpaths and a Cohen's kappa (cf. Wirtz & Casper, 2002) of .73 was achieved in the first instance. As described earlier, non-concordant codes were discussed until the two raters reached an agreement.

Results
Interview
In the second coding cycle, the symbols' helpfulness and fit crystallized as major themes. These two categories were divided into three subcategories each. Table 2 provides an example of each code.

Table 2. Overview of the students' answers for each field of the typology

Helpfulness

High	
Student 7:	They [the little pictures] helped me; they did not disturb me at all.
Interviewer:	And why did they help you?
Student 7:	You don't have to understand everything by reading. You also see the things you have to do.

Middle	
Interviewer:	Did the little pictures help or did they disturb you?
Student 11:	Well, actually, in between usually. So, disturbed is completely wrong in my case, but sometimes I didn't look at the pictures, because usually I didn't need them at all. But, other people are probably helped a lot by the pictures.

Low	
No student was assigned to this category. The following answer was expected for this category:	
Student x:	The pictures did not help me.

Fit of the symbols

High (All symbols represent the words below)	
Student 9:	Are there any pictures that do not fit?
Interviewer:	(Student browses through all exercises) Actually not, all of them fit…yes, all of them fit.

Middle (Part of the symbols represent the words below)	
Interviewer:	Are there any pictures that do not fit?
Student 10:	(Student shakes his head) Not really.
Interviewer:	Not really? Would you like to check if there are any symbols that do not fit?
Student 10:	(Students looks at Exercise 1 and points at the symbol for *writing*.) There, for example, the hand with the letters. (Student says something that is not comprehensible.)
Interviewer:	Did this one fit or not?
Student 10:	Not really.
Interviewer:	Mhm, this one did not fit. Let's go through the exercises; then you can look at them [the symbols] again (Interviewer browses through part of the exercises).
Student 10:	That's it.
Interviewer:	That's it? (Interviewer continues to browse through the exercises) Anything else?
Student 10:	Ehehm.

Symbol for writing

Low (Most of the symbols do not represent the words)

No student was assigned to this category. The following answer was expected for this category:
Student x: Almost all pictures did not fit with the words.

On the basis of this second cycle, a typology illustrating the students' attitudes towards symbols was developed. This nine-field scheme includes the students' attitude to the symbols' helpfulness as well as their view of the symbols' fit to the words they represent. The students were integrated into the scheme based on their statements in the interview (Table 3). The abbreviation SEN refers to students with special education needs.

Table 3. Typology

Fit of the symbols

High	Middle	Low

Helpfulness of the symbols	High	Student1 Student 2 Student 3 (SEN) Student 4 (SEN) Student 6 Student 7 (SEN) Student 9	Student 10 Student 12 (SEN)
	Middle	Student 11	Student 5 (SEN) Student 8
	Low		

Another important result of the interview was that almost all students were able to explain why there were symbols above the words (10 of the 12 students). The statements referring to this topic were categorized, as illustrated in Table 4.

Table 4. Overview of the students' answers about symbols' function.

Symbols support the general comprehension of the text	
Student 7:	You don't have to understand everything by reading. You also see the things you have to do.

Symbols are used to recheck meaning	
Student 2:	Hm, first I read and then I looked at the pictures to find out whether I understood it correctly.
Interviewer:	Mhm.
Student 2:	And if not, then, I read it again and looked at the pictures.

Symbols help if comprehension problems arise	
Student 2:	Ehm, the little pictures helped me because I could see how it works.
Interviewer:	Mhm.
Student 2:	Because sometimes I didn't understand the text and then I looked at the pictures and they helped me.
Interviewer:	Good.
Student 2:	Because, if you don't understand it completely, then you can see how you are supposed to do it there.

Symbols help for understanding individual words (student uses one or more examples to illustrate the symbols' function)	
Student 6:	Yes, eh, because there, because then, because there (Student 6 points at the symbol laptop, which looks like a laptop, and reads aloud the corresponding assignment) "Watch the video". There was also a laptop, so (Student 6 points at the real laptop) a laptop and yes.

Symbol for laptop

Interviewer:	Mhm.

624

| Student 6: | And, ehm (Student 6 points at the symbols headphone), there the headphones, because this (Student 6 reads aloud the corresponding assignment) "put the headphones on" and then you know it better, well…yes. |

Symbol for headphone

Not clear whether student recognizes the symbols' function	
Interviewer:	What do you think: Why are there symbols above the words?
Student 12:	Hm, I don't know. To look at them exactly.
Interviewer:	Mhm. Anything else?
Student 12:	No.

Before discussing the functions mentioned in more detail, we want to zoom in on the upper-left rectangle of the typology (Table 3). The next paragraphs focus on the eye-tracking data of four students (Student 1, Student 2, Student 4, and Student 7) who described the symbols as fitting and helpful.

Eye Tracking

The analysis of the scanpaths of these four students shows that symbols influence the reading process of the assignments because they almost always looked at the symbols before, after, or before and after. They refrained from looking at them in only very few cases; no pattern could be found concerning which symbols were ignored.

Students rarely moved their eyes between single words and their corresponding picture. This means that no complete sentences were viewed following the pattern of moving from word to symbol and back to the word again. With a few exceptions, the students read the sentences in one go without stopping. Only single words and the corresponding symbols were looked at following the transition pattern. Table 5 summarizes the number of observation patterns for each individual student and for all students. It also includes information on the students' educational needs, reading ability, and cognitive ability.

Table 5. Overview of the number of students' observation patterns, their educational needs, reading ability, and cognitive ability

	Student 1	Student 2	Student 4	Student 7	All students
Sentence Level					
Both	10	8	11	9	38
Text-Symbols	2	4	4	2	12
Symbols-Text	2	2	1	2	7
Text	3	3	0	4	10
Word level					
Transition (Words where transitions were observed)	8 (write, video, area [two times], square D, all squares, begin, fraction)	5 (count, fraction [two times], square D, all squares)	7 (puzzle pieces, count, write, fraction, take, order, write)	8 (count [two times], circle, take, all squares, puzzle pieces, order, begin)	28
Special educational needs (SEN)					
	without SEN	without SEN	with SEN	with SEN	
Reading ability (M = 100; SD = 15)					
	78	86	66	70	

Cognitive ability (M = 100; SD = 15)			
94	100	104	76
Age			
12	12	13	11
Grade			
5	5	6	5

Note: In the case of Student 4, one scanpath was not recorded due to technical problems.

Discussion

This study aimed at investigating how symbols are perceived by students with and without special needs. With the help of interviews and recording of the students' eye movements while they were working on the exercises, we wanted to acquire an insight into the cognitive processes underlying the perception of symbols. In this chapter, the study's main results will be summarized and brought together with reference to the three main research questions. The first research question was: How do students with and without special needs rate symbols in learning material (e.g., with regard to their helpfulness and fit)?

The typology, which is based on the students' statements during the interview, shows that students with and without special needs are similarly distributed in the different fields. Thus, the students' attitudes towards symbols seem to be independent of their learning condition. Furthermore, all of the students classified the fit and helpfulness of the symbols at least as medium. Thus, the students' general attitude towards symbols can be described as positive.

Regarding Research Question 2 (How do students with and without special needs perceive symbols in learning material?), the result was similar: On the basis of the scanpaths, no different types of viewers were found. All students looked at the symbols in individually different and flexible ways. No individual preferences were found. Thus, the students' reading and cognitive ability as well as their special educational needs did not seem to influence the order or pattern with which the text and the symbols were viewed. A reason for the similarity in pattern across the students could be that all students, students with and without SEN, benefit from the availability of symbols.

Both the interview and the eye tracking show that the students' general attitude towards (Research Question 1) and perception of (Research Question 2) symbols seems to be independent of their learning conditions. Students with and without special needs were similarly distributed in the fields (cf. Table 3) and, on the basis of the scanpaths, no different types of viewers were found, as all students used all patterns in flexible ways (cf. Table 4). Furthermore, the students' general attitude towards the symbols can be described as rather positive (cf. Table 3).

Another important aspect of Research Question 2 concerns the symbols' influence on the reading process. As already illustrated, the symbols were primarily used to acquire a holistic understanding of the assignment. The sentences were mainly read in one go, and no complete sentence was viewed with the *transition* pattern. Students did not read a sentence word by word and look at each corresponding symbol. Such a pattern was not found in any of the 67 scanpaths. Only single words and their relevant symbols were looked at in this manner. Thus, the symbols were mainly utilized to achieve a holistic comprehension of the assignments (sentence level) and not used to support the understanding of single words (word level).

As the support provided by symbols for the comprehension of complete sentences seems to be stronger than facilitating the understanding of single words, the following educational implication may be derived. One or few symbols illustrating the content of a whole sentence could be beneficial, instead of symbols representing single words. Thus, the development of symbols that visualize the content of complete sentences might be beneficial. As the development

of such symbols is rather time-consuming and complex, the use of photos representing the sentential logic could be an alternative, because they are easier to produce. This conclusion conforms with earlier studies (Mirenda & Locke,1989, Sevcik & Romski, 1986). Even though it can be assumed that photographs require a minimal amount of cognitive processing (Mirenda, 1985), it must be taken into account that photos, like symbols, can be misinterpreted (Ward & Townsley, 2005). Furthermore, when using photos or symbols that represent the content of whole sentence, transitions between single words and their relevant symbols are impossible. The reading process of some students may be hindered by this restriction. Thus, further studies are needed to investigate the use of photos and symbols that represent the content of whole sentences.

The third research question was: Are students with and without special needs able to access symbols without a prior explanation? If we consider the eye-tracking data, the code *text*, which means that the symbols are not looked at, rarely occurs. Only 10 of the 67scanpaths were coded as *text* (see also Table 5). Even though the purpose of the symbols above the words was not explained to the students, the students looked at them intuitively. Thus, based on the eye-tracking data, a positive answer can be given to Research Question 3.

During the interview, the students were asked why they thought there were pictures above the words. Almost all students could explain this; and four main functions were derived from the students' answers:

- Symbols support the general comprehension of the text
- Symbols are used to recheck meaning
- Symbols help if comprehension problems arise
- Symbols help for understanding individual words (student uses one or more examples to illustrate the symbols' function)

Some students mention more than one of these functions, which shows that they are able to use the symbols in a flexible way depending on their needs (to recheck, to overcome comprehension problems, to achieve an overall understanding of the assignment, etc.). Thus, no prior explanation about the function of symbols seems to be needed.

If we bring together the students' statements in the interview with their corresponding eye-tracking data, another aspect becomes apparent. If a student did not mention a certain aspect, it did not mean that he or she was not implicitly aware of it. For example, Student 4 was not able to mention any of the established functions (cf. Table 4). Nevertheless, his eye-tracking data shows that he looked at the symbols in a differentiated way. This leads to the assumption that, even though Student 4 did not articulate the purpose of the symbols properly, he was able to use them efficiently. Students 7, 2, and 1 mentioned only one symbol function each. However, their eye-tracking data shows that they actually used the symbols in different manners (to recheck complete sentences, to understand individual words, etc.). Thus, it can be assumed that, even though they mentioned only one function, they were implicitly aware of the others.

However, the small number of students limits the generalizability of our results and conclusions. Only 12 students took part in the interview, and only four of them participated in the eye tracking. A total of only 67 scanpaths was analyzed. Larger studies are needed to replicate the study's results. Furthermore, the methodological pitfalls should not be neglected. For example, we need to bear in mind the effect of social desirability and acquiescence on interviews (cf. Bryman, 2012), and the eye-tracking data can only serve as a valid indicator for perception if we apply the *eye-mind* and *immediacy assumption* (Just & Carpenter, 1980). Both assume that observed symbols are cognitively processed immediately. Furthermore, by editing the data (e.g., the transcription of the interviews), the raw data were changed. In this study, we aimed at referring to the primary data, for example, by using the interview videos during the process of

coding. Thus, the coding scheme was not based on the transcripts only. Another limitation is that no conclusion concerning the influence of symbols on the correctness of results can be drawn based on our data. Larger quantitative studies are needed to analyze whether symbols and/or photographs influence the performance of students in mathematics and other subjects. Despite these limitations, the study's aim to acquire a first qualitative insight into the processing of symbols from different perspectives was achieved.

One student summarized her eye movements as follows: "I looked at the pictures. Well, first I read the text, then I looked at the pictures, and then knew what I had to do". This statement represents the overall findings of this study quite well: The symbols have an influence, but do not interrupt the flow of reading; they are looked at before and/or after reading the text. Furthermore, students have a rather positive attitude towards symbols.

References:

Bryman, A. (2012). *Social research methods* (4th ed.). Oxford: Oxford University Press.

Cattell, R. B. (1968*).* Are IQ Test intelligent? *Psychology today*, 16.

Detheridge, T., & Detheridge, M. (2002). *Literacy through Symbols: Improving Access for Children and Adults* (2nd ed.). London: David Fulton.

Erickson, K. A., & Geist, L. A. (2016). The profiles of students with significant cognitive disabilities and complex communication needs. *Augmentative and Alternative Communication*, 32(3), 187–97. doi:10.1080/07434618.2016.1213312

Eichelmann, A., Narciss, S., Schnaubert, L., & Melis, E. (2012). Typische Fehler bei der Addition und Subtraktion von Brüchen [Typical errors for fraction addition and subtraction.]. *Journal für Mathematik-Didaktik*, 33, 29-57. doi:10.1007/s13138-011-0031-5

Hefendehl-Hebeker, L. (1996). Brüche haben viele Gesichter [Fractions possess many faces]. *Mathematik lehren*, 78, 20-48.

Hurtado, B., Jones, L., & Burniston, F. (2014). Is easy read information really easier to read*? Journal of Intellectual Disability Research,* 58, 822-829. doi: 10.1111/jir.12097

Just, M.& Carpenter, P. A. (1976). Eye fixations and cognitive processes. *Cognitive Psychology*, 8, 441–480.

Kieren, T.E. (1976). On the mathematical, cognitive, and instructional foundations of rational numbers. In R. Lesh (Ed.), *Number and Measurement: Papers from a Research Workshop* (101-144). Columbus, Ohio: ERIC/SMEAC

Kitzinger, A. (2015). METACOM 7. *Symbolsystem zur Unterstützten Kommunikation*. [Symbol set for Augmentative and Alternative Communication]. Oeversee.

Kvale, S. (2007). *Doing Interviews*. London: Sage.

Sekretariat der Ständigen Konferenz der Kultusminister der Länder in der Bundesrepublik Deutschland (1999). [Recommendations concerning learning disabilities.]. Retrieved from http://www.kmk.org/fileadmin/Dateien/pdf/PresseUndAktuelles/2000/sopale.pdf

Langer, I., Schulz von Thun, F.S., & Tausch, R. (2011). *Sich verständlich ausdrücken* [Express yourself in an understandable way]. München: Ernst Reinhardt Verlag.

Malle, G. (2004). Grundvorstellungen zu Bruchzahlen [Basic ideas about fractions]. *Mathematik lehren,* 123, 4-8.

Mayer, R. (2009). *Multimedia Learning* (2nd ed.). Cambridge: Cambridge University Press.

Mirenda, P. (1985). Designing pictorial communication systems for physically able-bodied students with severe handicaps. *Augmentative and Alternative Communication*, 1:2, 58–64. doi:10.1080/07434618512331273541

Mirenda, P., & Locke, P.A. (1989). A comparison of symbol transparency in nonspeaking persons with intellectual disabilities. *Journal of Speech and Hearing Disorders*, 54 (2), 131-140. doi:10.1044/jshd.5402.131

Netzwerk leichte Sprache [Network easy-to-read language] (2006). Regeln für die leichte Sprache [Easy-to-read guidelines]. Retrieved from: http://www.leichtesprache.org/images/Regeln_Leichte_Sprache.pdf

Padberg, F. & Wartha, S. (2017). *Didaktik der Bruchrechnung* [Didactics of fractions] (5th ed.). Heidelberg: Spektrum Akademischer Verlag.

Pitkethly, A. & Hunting, R. (1996). A review of recent research in the area of initial fraction concepts. *Educational Studies in Mathematics*, 30 (1), 5-38.

Prediger, S. (2004). Brüche bei den Brüchen [Breaks of fractions]. *Mathematik lehren*, 123, 10-13.

Poncelas, A., & Murphy, G. (2007). Accessible Information for People with Intellectual Disabilities. Do Symbols Really Help? *Journal of Applied Research in Intellectual Disabilities*, 20(5), 466-474.

Saldana, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Los Angeles: Sage.

Schink, A. (2013). *Flexibler Umgang mit Brüchen.* [Flexible handling of fractions.] Wiesbaden: Springer Fachmedien Wiesbaden.

Schnotz, W. (2005). An Integrated Model of Text and Picture Comprehension. In R. Mayer (Ed.), *The Cambridge Handbook of Multimedia Learning.* (49-70). Cambridge: Cambridge University Press.

Scholz, M., Dönges, C., Dechant, C. & Endres, A. (2016). Theoretische und konzeptionelle Überlegungen zur Vermeidung von Lesebarrieren bei naturwissenschaftlichen Schülerexperimenten. [Theoretical and conceptual approaches to reduce reading barriers in natural scientific texts.] *Zeitschrift für Heilpädagogik*, 67(10), 454-464.

Scholz, M., Dönges, C., Risch, B. & Roth, J. (2016). Anpassung von Arbeitsmaterialien für selbstständiges Arbeiten von Schülerinnen und Schülern mit kognitiven Beeinträchtigungen in Schülerlaboren. [Modification of learning material for pupils with intellectual disabilities in off campus student laboratories.] *Zeitschrift für Heilpädagogik*, 67(7), 318-328.

Scholz, M., Wagner, M., & Negwer, M. (2016). Motorische Fähigkeiten und Kompetenzen im Bereich Kulturtechniken von Schülerinnen und Schülern an Schulen mit dem Förderschwerpunkt körperliche und motorische Entwicklung. [Motor skills and competences in cultural techniques of students with special educational needs.] *Heilpädagogische Forschung*, 42(4), 191–201.

Sevcik, R., & Romski, M. A. (1986). Representational matching skills of persons with severe retardation. *Augmentative and Alternative Communication*, 2, 160–164. doi:10.1080/07434618612331273980

Siegler, R. S., Fazio, L. K., Bailey, D. H. & Zhou, X. (2013). Fractions: the new frontier for theories of numerical development. *Trends in Cognitive Sciences,* 17(1), 13-19.

Southerland, R. J., & Isherwood, T. (2016). The Evidence for Easy-Read for People with Intellectual Disabilities: A Systematic Literature Review. *Journal of Policy and Practice in Intellectual Disabilities,* 13(4), 297-310. doi:10.1111/jppi.12201

Ward, L., & Townsley, R. (2005). 'It's about a dialogue. . .' Working with people with learning difficulties to develop accessible information. *British Journal of Learning Disabilities*, 33, 59–64.

Weiß, R. H., & Weiß, B. (2006). *CFT 20-R: Grundintelligenztest Skala 2, Revision*. [CFT 20-R: Basic cognition scale 2]. Göttingen: Hogrefe.

Wimmer, H., & Mayringer, H. (2014). *SLS 2-9: Salzburger Lese-Screening für die Schulstufen 2-9.* [SLS 2-9: Salzburg Reading-Screening from grade 2 to 9]. Bern: Hogrefe.

Winter, H. (1999). *Mehr Sinnstiftung, mehr Einsicht, mehr Leistungsfähigkeit, dargestellt am Beispiel der Bruchrechnung* [More meaningfulness, more insight, more performance exemplified by fractions]. Retrieved from http://blk.mat.unibayreuth.de/material/db/37/bruchrechnung.pdf

Wirtz, M., & Casper, C. (2002). *Beurteilerübereinstimmung und Beurteilerreliabilität*. [Accordance and reliability between raters.] Göttingen: Hogrefe-Verlag.

Zentel, P. (2010). *Zur Bedeutung von multiplen Repräsentationen beim Lernen mit Computer und Internet für Menschen mit geistiger Behinderung* [The significance of multiple representations for learning with computers and internet for people with intellectual disabilities] (Doctoral dissertation, Eberhard-Karls-University Tübingen, Germany). Retrieved from https://publikationen.uni-tuebingen.de/xmlui/handle/10900/47815

Inclusion of Children with Autism Spectrum Disorders in Mainstream Primary School Classrooms: Zimbabwean Teachers' Experiences

Tawanda Majoko,

Department of Inclusive Education,

College of Education,

University of South Africa,

Pretoria, South Africa

Abstract

The shift in paradigm from exclusion to inclusion in education in Zimbabwe, in alignment with the global world, has resulted in a significant number of children with Autism Spectrum Disorders (ASD) being educated in mainstream primary school classrooms. Consequently, new demands are being made on teachers who are not necessarily adequately prepared for these children. The current study, embedded within the phenomenological approach, interpreted 24 Zimbabwean primary school teachers' responses to individual semi-structured, in-depth interviews on their experiences in the inclusion of children with ASD in mainstream classrooms. Despite participants' apprehension and uncertainty about inclusion, they held positive attitudes and commitment to its practice based on its entrenchment in human rights and social justice. Participants confronted and strategized on curriculum and instruction, communication, social and behaviour issues that interfered with the inclusion of children with ASD in mainstream

classrooms.   In-school and out-of-school support systems and resources, including the Zimbabwe Schools Psychological Services and Special Needs Education Department, teacher assistants, parents and educational psychologists supported teachers in the inclusion of children with ASD in mainstream classrooms. Professional development of teachers would assist them to support the inclusion of children with ASD in mainstream classrooms. Further research on the experiences of other stakeholders, including typically developing children, school administrators and parents in the inclusion of children with ASD in mainstream classrooms is needed.

Keywords: Autism Spectrum Disorders, children, inclusion, teachers, mainstream primary schools, Zimbabwe

Introduction

Since the adoption of the Universal Declaration of Human Rights (United Nations, 1948), a human rights and social justice agenda has guided educational policies of several countries and the United Nations (Pantic & Florian, 2015. Entrenched within this agenda, the educational policies of several countries mandate the rights of all children to equal valuation as members of the mainstream school education system regardless of their differences, including disability, religion, race, ethnicity, culture, gender, social and economic status, ability and health (Avramidis & Kalyva, 2007; Ballard, 2012; Humphrey & Symes, 2013). Consistent with these systemic movements in the educational systems, Zimbabwe adopted inclusion in 1994 (Chireshe, 2013; Mandina, 2012). In Zimbabwe, the pursuit of inclusion is evidenced by the Zimbabwe Education Act of 1987 as revised in 2006 (Majoko, 2013; Mpofu & Shumba, 2012) which mandates the education of children with disabilities in the mainstream school system. Inclusion is viewed as a value system which enshrines the entitlement of all children to equal access to learning, achievement and the pursuance of excellence in all domains of their school education (Ballard, 2012).

Inclusion embodies 'how' the education system can accommodate children with diverse learning needs (Pantic & Florian, 2015), constituting the promotion, where feasible, the processes of achievement, acceptance and participation in mainstream school classrooms of children with diverse learning needs (Florian & Spratt, 2013). Propelling the impetus for inclusion in

Zimbabwe and the global world are its benefits to both children with and without disabilities and to societies (Chireshe, 2013). Whereas inclusion fosters well-being, social, cognitive and language skills in children with disabilities, it develops in typically developing children awareness of their own abilities, assisting others, empathy, tolerance and compassion (Chandler-Olcott & Kluth, 2009) and combats discriminatory societal attitudes towards disabilities (Eldar, Talmor & Wolf-Zukerman, 2010). ASD is characterised by problems in communication (delay or lack of language development), social development (lack of development of peer relationships, impaired non-verbal behaviour), resistance to change and ritualistic behaviour (American Psychiatric Association, 2012). It is among the most common childhood neurological disorders in the world (Humphrey & Symes, 2013).

Rationale for the study

Since Zimbabwe has been in pursuance of inclusion for more than two decades, a significant number of children with ASD are educated in mainstream primary school classrooms (Chireshe, 2013). Since the inclusion of children with ASD is among the most complex and poorly conceptualised domains of education globally (Symes & Humphrey, 2010), Zimbabwean mainstream primary schools are struggling to successfully and effectively include children with ASD **(**Majoko, 2016**).** Thus, in Zimbabwe, comparable to the global world, research into teaching strategies, techniques and approaches for successful and effective inclusion of children with disabilities including ASD in mainstream schools is imperative (Mandina, 2012). The practice of inclusion is, nevertheless, not the simple application of particular pedagogical methods as it is hinged on the attitudes, knowledge and experience of teachers (Hinton et al., 2008). As regards children with ASD who are considered among the most challenging for successful inclusion in mainstream school education the world over (Symes & Humphrey, 2010), this is a critical consideration**.** Based on a literature search, there is a dearth of studies on teachers' experiences in inclusion of children with ASD in mainstream primary school classrooms in Zimbabwe.

Making educational institutions more inclusive may involve teachers in a painful process of challenging their personal discriminatory practices and attitudes (Ballard, 2012). Thus, continuous research into provision for children with disabilities including ASD in mainstream

education is a necessity for improved service delivery (Mandina, 2012). Teachers are central in the successful inclusion of children with ASD (Emam & Farrell, 2009; Florian & Spratt, 2013). Although a number of researchers explored teachers' perceptions of their professional competence as regards teaching children with ASD internationally (Humphrey, & Lewis, 2008), this is the first study to be executed within the Zimbabwean education system. Embedded in qualitative methodology, the present study interrogated teachers' experiences as a springboard for ascertaining the adequacy of their preparation through self-reported competence. Specifically, the present study sought to answer the following research questions: What are the experiences of teachers in inclusion of children with ASD in mainstream primary school classrooms in the Midlands educational province of Zimbabwe?; What issues do teachers confront in inclusion of children with ASD in mainstream primary school classrooms in Midlands educational province of Zimbabwe? and What systems and resources support the inclusion of children with ASD in mainstream primary school classrooms in Midlands educational province of Zimbabwe? The subsequent section presents teachers' challenges in the inclusion of children of children with ASD.

Teachers' challenges in inclusion of children with ASD

Owing to the placement of children with ASD in mainstream classrooms, teachers are obligated to successfully and effectively include these children often with a limited or an absence of guidelines and training (Horrocks, White & Roberts, 2008; Lindsay, Proulx, Scott & Thompson, 2013). Consequently, several schools struggle to meet the full range of needs of these children (Humphrey & Lewis, 2008; Leblanc, Richardson & Burns, 2009). Teaching practices and strategies for children with ASD is a key 'gap' in the knowledge and information base for special educational needs provision (Humphrey & Parkinson, 2006). Thus, teachers of children with ASD experience tension in managing the challenges these children present in social and emotional understanding (Barnes, 2009; Leach & Duffy, 2009). Such tensions include the anxiety teachers feel over the ability to meet the needs of these children while simultaneously meeting the needs of other children in the school classroom and these can determine the quality of teacher-child interactions (Humphrey & Symes, 2013).

Teaching children with ASD may need specific approaches that are unfamiliar to regular teachers (Leach & Duffy, 2009). Similarly, strategies that can be used can differ with the child's age, setting of the classroom and the included child (Hess, Morrier, Heflin & Ivey, 2008). It is, consequently, fundamental to equip teachers with as many strategies as possible (Lindsay et al., 2013). Whereas teachers, nevertheless, perceive that acquisition of these approaches and strategies would make a positive difference to their practice in classrooms, several presently lack the training for adequate support of these children (Emam & Farrell, 2009) and feel ill-prepared to meet their full range of needs (Humphrey & Parkinson, 2006). Because of the lack of training, teachers endure anxiety and stress (McGillicuddy & O'Donnell, 2013) and lack the confidence to manage and effectively include children with ASD in lessons (Humphrey & Parkinson, 2006). As regards special educational needs, training can also culminate in teachers having a more positive attitude towards inclusion (Horrocks et al., 2008). This is critical as positive attitudes towards inclusion are reported as a second prerequisite to successful inclusion of children with ASD (Emam & Farrell, 2009).

Although teacher training and attitudes towards inclusion are critical in inclusion, consideration of the wider-school context is also of importance (Florian, 2012). There is, indeed, a call for a paradigm shift from focusing on child deficits to a reviewing of whole school approach, practices and learning styles (Horrocks et al., 2008; Majoko, 2013). As regards the inclusion of children with ASD, it is argued that 'schools need to buy in wholesale to inclusion if its successful practice is to be realised' as positive outcomes are unachievable by a few staff members (Barnes, 2009). Teachers believe that additional support from a teaching assistant is indispensable, for children with ASD and their counterparts (Emam & Farrell, 2009). Without a shift in the attitude and approach of the whole organisation, it will fail children with ASD (McGillicuddy & O'Donnell, 2013). In whole school inclusion, all staff is required to have a clear and shared understanding of the aims and expectation of inclusion within their educational institution (Florian & Spratt, 2013); Eldar et al., 2010) and senior management support (Hess et al., 2008). Teachers believe that more needs be done to create inclusive social environments within classrooms (Hinton et al., 2008)

Challenges of inclusion to children with ASD and their peers

Difficulties in social interaction characteristic of children with ASD place these children at risk of negative social outcomes (Humphrey 2008). Children with ASD are more likely to spend their break and lunch times alone, and less likely to engage in co-operative interaction with children with no special educational needs (Humphrey & Symes, 2013). Children with ASD are approximately 20 times more likely to be socially excluded at school in comparison with other groups of children (Humphrey, 2008). Similarly, children with ASD are up to three times more likely to be bullied, are less likely to be socially supported and are more likely to be rejected than their counterparts (Symes & Humphrey, 2010).

Although all children may benefit academically and socially from positive relationships with their teachers (De Boer & Simpson, 2009), those with ASD may be challenging in this respect (McGillicuddy & O'Donnell, 2013). The exhibition of disinterest in interaction and behavioural problems of children with ASD can result in teachers less likely to have positive relationships with them (Eldar et al., 2010). Nevertheless, research cautions against generalisation from what is appropriate for typically developing children to their peers with ASD (Natof & Romanczyk, 2009). For instance, certain aspects of the child-teacher relationship may be irrelevant for children with ASD. Although the child-teacher relationship lacks an impact on the academic inclusion of children with ASD, it has been established to determine the extent of their social inclusion (Leach & Duffy, 2009). Teachers' more negative relationships with children with ASD results in less social acceptance of these children by their typically developing counterparts (Humphrey, 2008). Provision of appropriate training to teachers for successful inclusion of children with ASD within their classrooms is a strategy for minimisation of negative social outcomes (Hinton, et al., 2008; Leblanc, et al., 2009).

Children without ASD may experience difficulties trying to understand the behaviour of children with ASD (Humphrey, 2008). This can include struggling to understand that children with ASD behave in certain ways and that they may be nervous or frightened of them (Lindsay et al., 2013). Typically developing children may be hurt when their peers with ASD ignore or reject their social advances (Majoko, 2016). Children with ASD may distract or disrupt the learning of

other children due to disturbances within lessons if regimes are not kept (Emam & Farrell, 2009).

Children without developmental delays may experience frustration and difficulty in accepting the fact that their peers with ASD are treated differently (Leach & Duffy, 2009). This may include certain behaviours that go unpunished and different rules and expectations that apply to those with ASD that they see as unfair (Humphrey & Symes, 2013). They may feel that their peers with ASD 'get away' with things (Lindsay et al., 2013). Other children may feel uncomfortable when confronted by inappropriate behaviour from their peers with ASD (Humphrey, 2008). The inclusion of children with ASD, who need a lot of attention, in mainstream classrooms can result in reduced attention from the teachers for the other children if appropriate support is not available in the classroom (Symes & Humphrey, 2013). These children may also resent the extra attention teachers give to their counterparts with ASD (Emam & Farrell, 2009).

Theoretical framework

Inclusive pedagogy (Florian & Black-Hawkins, 2011), informed the present study. The philosophy is premised on focusing on learning for all children in the community of the classroom instead of only those identified as having 'additional needs' (Florian & Black-Hawkins, 2012; Pantic & Florian, 2015). Such a focus entails creation of learning opportunities that are adequately availed to 'everyone' in order that all children are able to participate in classroom life; extension of what is ordinarily available for all children, creation of a rich learning community, rather than use of teaching and learning strategies that are suitable for 'most' alongside something 'additional' or 'different' for some who experience difficulties; and focusing on 'what' is to be taught (and 'how') rather than 'who' is to learn it (Florian & Black-Hawkins, 2011; Florian & Spratt, 2013).

Inclusive pedagogy (Florian & Black-Hawkins, 2011), is also entrenched in rejection of deterministic beliefs about ability as being fixed and the associated idea that the presence of some will hold back the progress of others. Such rejection constitutes believing that 'all' children will make progress, learn and achieve; focusing teaching and learning on what children can do rather than what they cannot do; using a variety of grouping strategies to support everyone's

learning rather than relying on ability grouping to separate ('able' from 'less able' learners); and using formative assessment to support learning (Florian & Black-Hawkins, 2011; Pantic & Florian, 2015).

Inclusive pedagogy (Florian & Black-Hawkins, 2011), is further grounded in viewing difficulties in learning as professional challenges for teachers, rather than deficits in children, that encourage the development of new ways of working. Such viewing entails seeking and trying out new ways of working to support the learning of all children; working with and through other adults that respect the dignity of all children as full members of the classroom community; and commitment to continuing professional development so as to develop more inclusive practices (Florian & Black-Hawkins, 2011; Florian & Spratt, 2013). With respect to Zimbabwean policy and legislative framework, inclusion of children with ASD in their mainstream classrooms is grounded in individual teachers': accounting for difference as an essential aspect of child development in any conceptualization of learning; belief that they are qualified/ capable of teaching all children; and continuous development of creative new ways of working with other stakeholders.

Method

Study Design and data collection

In order to address the foregoing research questions, this study used a qualitative phenomenological framework as it enabled the researcher to capture the essences of meaning underlying how individual participants felt about their presented personal experiences (Bednall, 2006; Cohen, Manion & Morrison, 2007). A constant comparative approach was used to uncover the meanings participants attached to the ways in which they dealt with specific aspects of their existence (McMillan & Schumacher, 2006).

Participants

Twenty-four (15 male and nine female) teachers, comprising three Early Childhood Education and Development, two Grade 1, four Grade 2, three Grade 3, two Grade 4, five Grade 5, one Grade 6 and four Grade 7, participated in the study. They were purposively drawn from three public primary schools located in low to high socio-economic statuses settings particularly farm,

rural and urban areas in the Midlands educational province of Zimbabwe. Each school had an average enrolment of 600 children. All 24 participants met the inclusion criteria to participate in the study particularly (1) at least an undergraduate qualification with endorsement in primary school education; (2) at least five years' experience in teaching within mainstream primary school classrooms; (3) at least two years' experience in teaching children with ASD in mainstream primary school classrooms; and (4) are presently teaching in a mainstream primary school classroom with a child/children with ASD. The mainstream teaching experience of the participants ranged from seven to over 21 years and their experience in teaching children with ASD ranged from four years to thirteen years. Participants based their interview question responses on five female and nineteen male children with ASD that they were teaching.

Interview Schedule

In education, psychology and sociology, the use of an original semi-structured interview schedule in the generation of data for analysis is a common phenomenon (Cohen et al., 2007; Creswell, 2009). This study used interview schedules (see Table 1) based on a review of interview schedules developed previously within the disability literature. These include Eldar et al. (2010), Humphrey & Lewis (2008), McGillicuddy & O'Donnell (2013) and Lindsay et al. (2013). Six members of the Department of Inclusive Education of the University of South Africa reviewed the interview schedule by commenting on its content suitability and suggesting refinements to the questions before its administration. Its final version constituted seven questions.

Table 1. Teacher Interview Schedule

General questions

- How do you understand ASD?

- What are your experiences in inclusion of children with ASD in your classroom?

- What issues do you confront in inclusion of children with ASD in your classroom?

Probing questions

- What systems and resources support the inclusion of a child with ASD in your classroom?

- What resources, if any, do you feel would further support the inclusion of a child with ASD in your classroom?

- How do you manage the issues you confront in inclusion of a child with ASD in your classroom?

- What strategies, if any, do you use in inclusion of a child with ASD in your classroom?

Procedure

Ethical approval to execute the study was sought and obtained from MoPSE of Zimbabwe, Midlands provincial education offices and principals of participating primary schools. Participants for this study were purposively sampled through contacts with Midlands provincial education offices. In order to establish eligibility and to schedule interview settings and times, individual participants were screened by telephone. Informed consent was sought and obtained from the participants prior to the onset of the interviews. After teachers' verbal declaration of interest, they were emailed both the information about this study and the consent form. Following the receipt of the teachers' signed consent forms, they were contacted once again and suitable interview times and settings were scheduled.

Interviews were conducted in English in a quiet area of each participant's school on interview appointment days at a time outside participants' regular class teaching periods. Before the onset of the interview, each teacher was reminded of the voluntary nature of their participation, the anonymity of all of their responses, their right not to answer any question that they felt were not comfortable with and informed of their right to withdraw from the interview session at any point although none did so. With participants' informed consent, an audio recorder was used in each interview session. No time limit was set in order to ensure consistency in the process of data collection. The interviews ranged from 45 minutes to 80 minutes. Pseudonyms were used to ensure anonymity and confidentiality of the participants.

Analysis

Consistent with the phenomenological approach, inductive thematic content analysis, which is a process utilised to identify and analyse patterns and themes, was used in data analysis (Babbie & Mouton, 2011). In the first level of analysis, the researcher and the two critical readers, who were experts in qualitative research, independently examined individual participant transcripts to determine recurring themes. In order to identify both unique and common themes (Grbich,

2007), the second level of analysis entailed identification of themes across transcripts. Data analysis sought to acquire a sense of overall meaning instead of frequencies (Cohen et al., 2007). In alignment with the qualitative approach, direct quotes were utilised as much as possible in order to entrench study findings and interpretations (Creswell, 2009). The researcher and the critical readers considered it more fundamental to consider the commonalities and themes across all participants. Trustworthiness and accuracy issues were addressed numerous times throughout study. In order to maintain consistency with the research questions, the researcher and the critical readers, began by classification of the statements according to the research questions of the study. The researcher and the critical readers also independently analysed the data so as to address the threats of the accuracy of interpretation. The researcher and the critical readers, thereafter, jointly discussed their analyses which resolved discrepancies through reviewing relevant data. Further, accuracy of interpretation was addressed through colleague checks. Additionally, participants were requested to review the transcripts and, when necessary, add further explanatory information.

Results

The data analysis, based on three research questions of the study, generated three themes, namely, experiences in inclusion, issues and strategies in inclusion and support systems and resources for inclusion. It also generated eight sub-themes, namely, apprehension and uncertainty about inclusion, attitudes towards inclusion, curriculum and instruction, communication, socialisation, behaviour, and in school and out of school support (see Table 2). Illustrative quotes are presented below for each instance.

Table 2. Teachers' experiences in inclusion of children with ASD

Theme	Subtheme
Experiences in inclusion	Apprehension and uncertainty about inclusion, Attitudes towards inclusion
Issues and strategies in inclusion	Curriculum and instruction, communication, socialisation, behaviour
Support systems and resources for inclusion	In school support, out of school support

Experiences in inclusion

Apprehension and uncertainty about inclusion

Inconsistent with inclusive pedagogy which requires teachers to believe and be convinced that they are qualified and capable of teaching all children (Florian & Spratt, 2013), participants experienced apprehension and uncertainty about the inclusion of children with ASD in their mainstream classrooms, as revealed in the following selected excerpts:

'Soon after the inclusion of the child with ASD in my classroom, I could not imagine it. I was hesitant and uncertain about her teaching and learning' (Teacher 24).

'His [the child with ASD] exceptionality was evident to all his classmates. I could not figure out whether or not they would accept him. I was apprehensive about my ability to cope with his pedagogy (Teacher 11).

Referring to their previous teacher education, participants perceived the 'additional' professional demands required from them in the inclusion of children with ASD in their mainstream classrooms. They expressed feelings which included denial, disbelief and finally acceptance. This was inconsistent with inclusive pedagogy which requires teachers to account for difference as a fundamental component of human development in any conceptualisation of learning (Florian & Black-Hawkins, 2011), as confirmed in the following selected excerpts:

'I felt clueless regarding the management of his [the child with ASD] teaching and learning. His inclusion in my classroom was the most daunting event since I joined teaching' (Teacher 14).

'With all children functioning at significantly different cognitive levels in my class, the inclusion of a child with ASD meant more professional demands from me' (Teacher 1).

Attitudes towards inclusion

Although participants were apprehensive and uncertain about their preparation for

inclusion of children with ASD in their classrooms, they held positive attitudes and commitment to the practice. Participants' attitudes were in alignment with inclusive pedagogy which is embedded in teachers' commitment to enhance the achievement of all children whilst safeguarding the inclusion of those who are vulnerable to exclusion and other forms of marginalisation (Florian, 2012;). One participant reported that, 'consistent with our national and global policies, including the constitution and conventions, all children, including those with ASD, need to be afforded their fundamental right to an inclusive education'. Another participant added, '… from Western Christian, African Traditional Religion, Ubuntu and human rights and social justice perspectives, it is the responsibility of every stakeholder to strive for the inclusion of children with ASD and other conditions in education' (Teacher 24). Another participant reported that, 'due to my social, cultural, moral and legal obligation to include all children in my classroom, I finally accepted him' (Teacher 6).

Inclusion issues and strategies

Participants revealed that, as they progressed from denial to acceptance of inclusion of children with ASD, they adopted issue specific strategies to facilitate the practice, which emerged as four sub-themes presented below. Similarly, inclusive pedagogy is embedded in learning of all children in the community of the school classroom (Florian & Black-Hawkins, 2011),

Curriculum and instruction

Participants revealed that they utilised pedagogical practices which were based on their teacher education and experience to include children with ASD in mainstream classrooms. Similarly, inclusive pedagogy requires teachers to strategize on addressing exclusion and underachievement in teaching and learning (Florian & Black-Hawkins, 2011). For instance, participants who had in-service training on special needs education reported that they had inadequate professional development in the inclusion of children with ASD hence 'kept referring to the few lecture notes in their teaching. These notes included teaching methods, strategies and techniques such as direct instruction, exploratory learning and simulations' (Teacher 5). Another participant added, 'I use Individualised Educational Plans for him and his peers without developmental delays for effective teaching and learning. I learnt how to design and implement these plans during my in-

service training' (Teacher 11). On the other hand, participants who were more experienced in teaching, but lacked training in inclusion of children with ASD, expressed that they based their lessons on their 'teaching experience in lesson planning and delivery every school day which equipped them with deductive and inductive teaching strategies' (Teacher 17).

Communication

Participants confronted several communication issues including the lack of functional and verbal communication presented by children with ASD. Cognisant of this, participants established and used the communication abilities of individual children with ASD to provide needs-responsive interventions. Participants reported that their communication interventions were grounded in daily life experiences and environment of individual children with ASD. Similarly, inclusive pedagogy requires teachers to embed teaching and learning in the social-cultural contexts of children (Florian & Spratt, 2013), For instance, one participant reported that 'since my learner with ASD lacks functional language, I pair gestures that are used in his daily life with speech while teaching. I relate my teaching to his home and community life and daily experiences' (Teacher 19). Another participant expressed that, the child with ASD 'misunderstands abstract language. I therefore teach using concrete language and immediate examples to eliminate abstract concepts. I always teach in context' (Teacher 22). Similarly, another participant revealed that, 'I reinforce appropriate behaviour such as asking to go to the toilet appropriately and ignore inappropriate behaviour such as screaming when signalling to want to go to the toilet. I always positively reward socially and culturally approved behaviour' (Teacher 2).

Socialisation

Participants perceived that children with ASD were socially and educationally excluded in mainstream schools because of their impairments in the social domain including deficits in social cues, responsiveness and social interactions. Participants cited that children with ASD engaged in lonely activities in and outside the classrooms. One participant expressed that the child with ASD 'functions in a fantasy world. He plays alone during break, lunch or sporting time' (Teacher 6). Another participant reported, 'my learner (the child with ASD) lacks interest in responding to typically developing peers because she is interested and emotionally attached to the non-living world including clay cows' (Teacher 20). Participants expressed that they used

several intervention strategies including teaching social skills, supervision of social interactions, use of short social stories, provision of specific social rules, reinforcement of positive social interactions and fostering in typically developing children an understanding and accommodation of their peers with ASD. Similarly, inclusive pedagogy is premised on extension of what is ordinarily available for all children (Pantic & Florian, 2015). One participant cited that, 'I craft easily seen, understandable and daily applicable social rules including turn-taking to provide the child with ASD and those without the condition positive social interactions' (Teacher 18). Another participant expressed that, 'I teach social skills such as befriending to children with ASD and their typically developing peers for social interaction' (Teacher 3). Similarly, another participant articulated, 'I use children without developmental challenges as peer models, ball games and pair work in academic work' (Teacher 23).

Another participant revealed that, apart from teaching typically developing children to understand their peers with ASD through inclusion of disability issues into pedagogy, he adapted curricular and co-curricular activities such as classroom lessons and sport and recreation activities to the ability levels of all children and nurtured a collaborative culture in her classroom to 'facilitate inclusion'. Another participant who had training in special needs education added, 'I use collaborative approaches including pair work and group work in teaching physical education, numeracy, literacy and art education to acculturate the child with and that without ASD to celebrate and accommodate each other' (Teacher 15). Similarly, inclusive pedagogy requires teachers to focus on *what* is to be taught (and *how*) instead of *who* is to learn it (Florian & Black-Hawkins, 2011).

Behaviour

Participants confronted behavioural issues including unusual obsessions and compulsions, unusual sensory experiences and repetitive use of objects presented by children with ASD. These interfered with the inclusion of these children in mainstream classrooms. One participant, for instance, posited that, 'unusual obsessions with desires, objects, ideas, and sporting activities and compulsive behaviour patterns including humming, licking and sucking hampers social cohesion of the child with ASD with the rest of the class' (Teacher 12). Another participant expressed, 'the child I teach is hypersensitive to touch, has baseless phobia, expresses fear in unusual ways

and verbally outbursts' (Teacher 8). Another participant added, 'because of his unusual sensitivity to sound, he is easily unsettled by sudden or loud sound and overwhelmed by excessive verbal direction'. Participants reported that they used several intervention strategies including reinforcements, academic modifications, environmental adaptations and structured routines. Similarly, inclusive pedagogy requires teachers to shift their focus from "most" and "some" children to "everybody" in teaching and learning (Florian, 2012). One participant posited that, 'I reinforce preferred activities of the learner with ASD and those without the condition upon completion of tasks' (Teacher 1). Another participant added, 'I have sensitised typically developing learners to maintain low levels of noise in the classroom. I am always on guard regarding early signs of behavioural disorders' (Teacher 21). Similarly, another teacher articulated,

> '… in order to lower the potential for anxiety for the learner with ASD, I prepare and explain any changes about the daily routine. I put picture symbols including donkeys and bold texts that draw his attention on the schedule to show change in routine such as change in break time and then verbally and visually remind him of the upcoming events a few minutes before transition' (Teacher 5).

Support systems and resources for inclusion

Participants revealed two forms of support systems and resources for the inclusion of children with ASD in mainstream classrooms, namely, in school and out of school support. Similarly, inclusive pedagogy requires engagement of teachers in collaborative actions to address issues requiring responses beyond the classroom (Florian & Spratt, 2013),

In school support

Participants reported that teacher assistants supported them in inclusion of children with ASD in mainstream classrooms. They cited that, teacher assistants attended to both children with and without ASD. Similarly, inclusive pedagogy is embedded in teachers' involvement in professional and social networks seeking to optimise social justice (Florian & Black-Hawkins, 2011). One participant expressed, 'She is trained in management of children with ASD including handling temper tantrums presented by the boy in our class' (Teacher 13). Another participant

explained that, because of experience, 'the assistant teacher is confident in the face of explosive outbursts from the learner with ASD and is always in total control of all the children' (Teacher 9). The other participant revealed that all teacher assistants at their school had served their institution for at least five years because of their professional preparation for children with ASD. All participants acknowledged that adequately professionally prepared and experienced teacher assistants were fundamental in the inclusion of children with ASD in mainstream classrooms. One participant expressed, '… working with an assistant teacher with the know-how, know-with and experience in ASD this year, the inclusion of the learner with ASD in my classroom is on track' (Teacher 4). Participants revealed that out of school support was integral in the inclusion of children with ASD in mainstream classrooms.

Out of school support

As primary socialisation agents of all children, including those children with ASD, parents provided participants with critical support including knowledge and information in inclusion of these children. This was in alignment with inclusive pedagogy which requires substantive engagement of stakeholders including families in decisions about education (Florian & Black-Hawkins, 2011). Through collaboration and discourse with parents in scheduled and unscheduled parent-class teacher meetings, parent classroom visits and their own home-visits, participants synchronised 'home grown' and 'school grown' interventions which exposed children with ASD to consistent academic and behaviour management frameworks. Educational psychologists supported participants and children with ASD as they assessed these children and provided teachers with psychotherapy and inclusive pedagogy management strategies. One participant revealed, 'I only realised after the educational psychologist had gone that my stress level had subsided and I had standby strategies to use with my child with ASD' (Teacher 7).

Participants cited that the Zimbabwe Schools Psychological Services and Special Needs Education Department afforded them individual and institutional capacity building in the inclusion of children with ASD through fostering in them positive attitudes, skills, competencies, understandings and provision of responsive services and programmes. Similarly, inclusive pedagogy is grounded in stakeholders' sharing responsibility within school for the outcomes of all children (Florian & Spratt, 2013). Participants reported that the department afforded them

several services including assessment, staff development on inclusion and advocating for the awareness of children with disabilities including ASD and inclusive school education among role players including peer teachers, school heads, communities and parents. As one teacher presented, 'the Schools Psychological Services and Special Needs Education Department staff presents demonstration lessons and observes my lessons and advises me on how to improve on inclusive teaching and learning' (Teacher 3). Similarly, another participant articulated, 'the Schools Psychological Services and Special Needs Education Department assessments facilitated early diagnosis and intervention of the learner with ASD I teach' (Teacher 21).

Participants reported that the provision of staff development on inclusion at national, provincial and district levels supported them. In spite of participants' acknowledgement of the provision of professional development at these levels, they revealed that they were focused on the inclusion of children with disabilities generically instead of those with ASD. This was in alignment with inclusive pedagogy which requires teachers' extension of the range of opportunities that are availed to everyone in the learning community of the classroom and school (Florian, 2012), as confirmed in the following selected excerpts:

> 'All the national, provincial and district staff development workshops, conferences and meetings that I have attended since I joined the profession were on children with diverse disabilities' (Teacher 6).

> 'Inclusion of children with ASD requires our exposition to staff development that can equip us with the relevant expertise in managing these children' (Teacher 14).

> 'I desperately need staff development on ASD rather [than] generic disability categories' (Teacher 7).

Inclusive pedagogy requires the teaching profession to develop innovative ways of working with other stakeholders (doing) (Florian & Black-Hawkins, 2011). Participants revealed that it was a combination of in school and out of school support that 'propelled' the inclusion of children with ASD in their classrooms.

Discussion

 In Zimbabwe and internationally, the paradigm shift from exclusion to inclusion of children with disabilities, including those with ASD, in mainstream school classroom education exerts several demands on teachers who are not necessarily prepared to successfully and effectively manage the challenge (Majoko, 2016). Although the training of teachers on inclusion influences their effectiveness in delivery of inclusive pedagogy (Emam & Farrell, 2009), this study reveals several issues and strategies for inclusion of children with ASD in mainstream school classrooms gleaned from teachers based on their mainstream teacher training and teaching experiences. Upon the inclusion of children with ASD in mainstream classrooms, participants experienced denial, fear, uncertainty and projected increased professional workload regarding pedagogical management and behaviour of these children due to their professional ill-preparation coupled with the educational demands of typically developing children. Similarly, previous studies reveal that, in the inclusion of children with unique and challenging needs including those with ASD, teachers experience increased workload stress levels because of the lack of pedagogical expertise, materials, resources, facilities and services to assist them in coping with the demands and challenges of the education of these children (Lindsay et al., 2013). Seemingly, with adequate professional preparation teachers may report experiences of acceptance and confidence in successful and effective inclusion of children with ASD in mainstream classrooms.

Participants held positive attitudes and commitment to the inclusion of children with ASD in their mainstream classrooms. Participants' strong and positive attitudes towards inclusion are consistent with research which reveals that, although teachers feel professionally ill-prepared for inclusion, they are committed to it (Avramidis & Kalyva, 2007). Participants' positive attitudes towards inclusion was based on the perceived entrenchment of the philosophy in both African and Western world views and practices, particularly national and international legal, social, cultural and religious premises including human rights and social justice principles, Christianity, African Tradition Religion and Ubuntu. Similarly, previous studies reveal that teachers' conceptualisation of inclusion influences their support for it (Pantic & Florian, 2015).

Despite the initial apprehension and uncertainty about the inclusion of children with ASD in mainstream classrooms, participants finally accepted and strategized on the education of these

children, basing it on their teacher education, teaching experience, social, cultural, moral and legal obligations. Inconsistent with previous studies which revealed that professional preparation and development of teachers for inclusion is foundational in their acceptance of its practice (Barnes, 2009; Chandler-Olcott & Kluth, 2009), this study revealed that several factors, including commitment and innovation, impacts on teachers' acceptance of the inclusion of children with disabilities in their mainstream classrooms. Despite participants' strategization on teaching and learning of children with ASD in mainstream classrooms, they were exposed to regular teacher education which did not prepare them for inclusive pedagogy. Nevertheless, the effectiveness of participants' strategies on the inclusion of children with ASD in mainstream classrooms is unknown since they lacked preparation in inclusion.   Previous studies reveal that teachers need preparation in inclusion to be equipped with evidence-based practices for successful inclusion of children with disabilities, including ASD, in mainstream classrooms (De Boer & Simpson, 2009; Eldar et al., 2010).

Participants confronted and strategized on communication issues including the lack of functional and verbal communication among children with ASD. Also, previous studies found that children with ASD present communication deficits which need responsive intervention for the successful inclusion of these children in mainstream school classrooms (Farrell, Alborz, Howes & Pearson, 2010). Participants used needs-based interventions for communication including pairing of gestures with speech in communication for those who lacked functional language, use of concrete language for those who often misunderstood abstract language and reinforcement of appropriate communication behaviour to address communication required to facilitate the inclusion of children with ASD in mainstream classrooms. Similarly, previous studies found that the inclusion of children with ASD in mainstream classroom requires teachers to adopt strategies that are responsive to the communication needs of these children (Lindsay et al., 2013). Thus, the use of simple augmentative communication strategies and techniques can support teachers' communication with children with children with ASD who lack functional and verbal communication.

Participants confronted and strategized on impairments of children with ASD in the social domain including deficits in social cues, responsiveness and social interactions through teaching social skills, using short social stories, provision of specific social rules, reinforcement of

positive social interactions and fostering in typically developing children understanding of their atypically developing peers. Similarly, previous studies found that social impairments interfere with the inclusion of children with ASD in mainstream classrooms (De Boer & Simpson, 2009; Natof & Romanczyk, 2009). Participants used several strategies including teaching turn taking, befriending, peer models, ball games and pair work to intervene in the deficits of children with ASD in the social domain. Similarly, previous studies established that social interventions are integral in facilitating the inclusion of children with ASD in mainstream classrooms (Leach & Duffy, 2009). Thus, teachers can entrench intervention on deficits of children with ASD in the social domain in the social-cultural contexts to support the inclusion of these children in mainstream classrooms.

Children with ASD engaged in 'self-isolation' including engagement in lonely play, not responding to their typically developing peers and attachment to the non-living world. Participants used several strategies, including the infusion of disability issues in pedagogy and the institutionalisation of collaborative culture in their classrooms, to foster in typically developing children socialisation and understanding of children with ASD. Similarly, previous studies reveal that disability awareness fosters in typically developing children positive attitudes towards their atypically developing peers (Ballard, 2012). Thus, teachers' strategies for intervention on 'self-isolation' of children with ASD, may need to be targeted at these children and their typically developing peers in order to socialise them to co-exist.

Participants confronted and intervened on several behavioural issues of children with ASD including unusual obsessions, unusual sensory experiences and repetitive use of objects which hampered the inclusion of these children in mainstream classrooms. Similarly, previous studies have found that behavioural impairments hinder the inclusion of children with ASD in mainstream classrooms (Humphrey, 2008). Participants used several behavioural interventions including reinforcement, academic modifications, environmental adaptations and structured routines in response to the needs of children with ASD to facilitate the inclusion of these children in mainstream classrooms. This finding is consistent with previous studies which reveal that responsive behavioural interventions are integral in the inclusion of children with ASD in mainstream classrooms (Barnes, 2009). Participants' needs-responsive interventions for children with ASD, despite their lack of training on the condition, suggest that teachers' attitudes and

commitment rather than specialised training are integral in influencing their intervention on behavioral challenges presented by these children. Nevertheless, the effectiveness of their behavioural interventions is unknown as they were not observed delivering services in their mainstream classrooms.

Participants revealed that they greatly depended on teacher assistants in the management of both children with and without ASD in mainstream classrooms. Participants perceived teacher assistants as knowledgeable, informed and experienced in serving children with ASD based on their daily management of these children. Thus, teacher assistants need comprehensive training and experience in order to adequately support teachers in inclusion of children with ASD in mainstream classrooms. Consistent evidence demonstrates that teacher assistants can shadow children with ASD in mainstream classrooms either at all times or part of the time (Eldar et al., 2010). In pursuance of the inclusion of children with ASD, participants were supported by the parents through the provision of fundamental information including intervention strategies which necessitated consistency between home and school management of the behaviour of these children. Previous studies also reveal that parents are integral in the inclusion of children with ASD in mainstream classrooms (Emam & Farrell, 2009; Humphrey & Lewis, 2008). Teacher-parent collaboration is therefore integral in successful and effective delivery of services to children with ASD.

Educational psychologists afforded participants psychotherapy and strategies for managing the pedagogy of children with ASD. Thus, collaborative cultures between teachers and other professionals can enhance the inclusion of children with ASD in mainstream classrooms. Previous studies reveal that specialised support services and programmes are indispensable in the inclusion of children with ASD (Hinton et al., 2008).The Schools Psychological Services and Special Needs Education Department staff provided participants with support including staff development, advice, assessment of children with ASD and advocacy for awareness of ASD among stakeholders. Previous research shows that individual and institutional capacity building supports the practice of inclusion (Avramidis & Kalyva, 2007; Ballard, 2012). The establishment of structures for delivery of specialised and other related services can support the successful and effective inclusion of children with ASD in mainstream classrooms.

Consistent with previous studies which reveal that teachers need continuous professional development to successfully practice inclusion (Florian & Spratt, 2013), participants were exposed to national, provincial and district support including professional development on the inclusion of children with disabilities in general. Participants were though in need of professional development on management and inclusion particularly of children with ASD. Continuous professional development on inclusion therefore needs to respond to the needs of teachers in serving children with disabilities including those with ASD in order to improve their delivery of services to these children in mainstream school classrooms. Similarly, previous studies found that teachers require professional development that addresses their concerns in order to be effective in improving the pedagogical experiences of both children with ASD and their typically developing counterparts (Humphrey, 2008). This could enhance their positive attitudes and confidence in teaching children with ASD and deepen and widen their understanding of ASD for effective working with assistant teachers.

Limitation

Although the foregoing discussion is in alignment with previous, multiple, independently executed, small-scale qualitative studies and strengthens their findings, the findings of the current small-scale qualitative study is not transferrable to a larger cohort of participants on the same phenomenon in different geographical settings devoid of clarification and supportive evidence. Nevertheless, the present study adds to the literature base on ASD since it provides a phenomenological perspective on teachers' experiences, issues, strategies, support systems and resources for the inclusion of children with ASD in mainstream classrooms. The current study reveals that positive attitudes, professional development and support of teachers are foundational in the inclusion of children with ASD in mainstream classrooms. Nevertheless, further research is needed detailing the experiences of other stakeholders including typically developed children, parents and school administrators.

References:

American Psychiatric Association. (2012). Autism spectrum disorders. Retrieved from www.autismsocietycanda. Ca/asd_research_prevalence/index_e.html

Avramidis, E., & Kalyva, E. (2007). The influence of teaching experience and professional development on Greek teachers' attitudes towards inclusion. *European Journal of Special Needs Education, 22(4),* 367-389.

Babbie, E., & Mouton, J. (2011). The practice of social research. Cape Town: Oxford University Press South Africa.

Ballard, K. (2012). Inclusion and social justice: teachers as agents of change. In Teaching in Inclusive School Communities, S. Carrington & J. Macarthur (eds.), 65-87. John Wiley & Sons Australia.

Barnes, K. (2009). The attitudes of regular education teachers regarding inclusion of students with Autism. *Dissertation Abstracts International 69 (10a),* 3905.

Bednall, J. (2006). Epoche and bracketing within the phenomenological paradigm. *Issues in Educational Research,* 16, 123-138.

Chandler-Olcott, K., & Kluth, P. (2009). Why everyone benefits from including students with autism in literacy classrooms. *The Reading Teacher 62 (7)*, 548 -57.

Chireshe, R. (2013). The state of inclusive education in Zimbabwe: Bachelor of Education (Special Needs Education) students' perceptions. *Journal of Social Science, 34(3):*223–228.

Cohen, L, Manion, L & Morrison, K. (2007). *Research methods in education*. London: Routledge.

Creswell, J.W. (2009). *Research design: Qualitative, quantitative and mixed methods approaches*. (3rd edition). Thousand Oaks, CA: Sage.

De Boer, S., & Simpson, R. (2009). *Successful inclusion for students with autism: Creating a complete, effective ASD inclusion program.* San Francisco, CA: Jossey-Bass.

Eldar, E., Talmor, R., & Wolf-Zukerman, T. (2010). Successes and difficulties in the individual inclusion of children with Autism Spectrum Disorder (ASD) in the eyes of their coordinators. International Journal of Inclusive Education, 14(1), 97-114.

Emam, M., M., & Farrell, P. (2009). Tensions experienced by teachers and their views of support for pupils with autism spectrum disorders in mainstream schools. *European Journal of Special Needs Education, 24 (4)*, 407-422.

Farrell, P., Alborz, A., Howes, A., & Pearson, D. (2010). The impact of teaching assistants on improving pupils' academic achievement in mainstream schools. A review of the literature. *Educational Review, 62,* 435-448.

Florian, L. (2012). Preparing teachers to work in diverse classrooms: key lessons for the professional development of teacher educators from Scotland's Inclusive Practice Project. *Journal of Teacher Education, 63(4),* 275-285.

Florian, L. & Black-Hawkins, K. (2011). Exploring inclusive pedagogy, *British Educational Research Journal, 37(5),* 813-828.

Florian, L. & Spratt, J. (2013). Enacting inclusion: a framework for interrogating inclusive practice. *European Journal of Special Needs Education, 28(2),* 119-135.

Grbich, C. (2007). *Qualitative data analysis: An introduction*. London: Sage. Howes, A. (2003). Teaching reforms and the impact of paid adult support on participation and learning in mainstream schools. *Support for Learning, 18,* 147-153.

Hess, K., Morrier, M., Heflin, L., & Ivey, M. (2008). Autism treatment survey: Services received by children with autism spectrum disorders in public school classrooms. *Journal of Autism and Developmental Disorders, 38 (5),* 961-971.

Hinton, S., Sofronoff, K., & Sheffield, J. (2008). Training teachers to manage students with Asperger's syndrome in an inclusive classroom setting. *The Australian Educational and Developmental Psychologist, 25,* 34-48.

Horrocks, J.L., White, G., & Roberts, L. (2008). Principals' attitudes regarding inclusion of children with autism in Pennsylvania public schools. *Journal of Autism and Developmental Disorders, 38(8),* 1462-1473.

Humphrey, N. & Symes, W. (2013). Inclusive education of pupils with autistic spectrum disorders in secondary mainstream schools: teacher attitudes, experience and knowledge. *International Journal of Inclusive Education, 17 (1),* 32-46.

Humphrey, N. (2008). Including pupils with autistic spectrum disorders in mainstream schools. *Support for Learning, 23(1),* 41 – 47.

Humphrey, N., & Lewis, S. (2008). Make me normal: The views and experiences of pupils on the autistic spectrum in mainstream secondary schools. *Autism, 12 (1),* 23-46.

Humphrey, N., & Parkinson, G. (2006). Research on interventions for children and young people on the autistic spectrum: A critical perspective. *Journal of Research in Special Educational Needs, 6(2),* 76-86

Leach, D., & Duffy, M., L. (2009). Supporting students with autism spectrum disorders in inclusive settings. *Intervention in School and Clinic, 45(1),* 31-37.

Leblanc, L., Richardson, W., & Burns, K., A. (2009). Autism spectrum disorder and the inclusive classroom. *Teacher Education and Special Education: The Journal of the Teacher Education Division of the Council for Exceptional Children, 32(2),* 166-179.

Lindsay, S., Proulx, M., Scott, H., & Thompson, N. (2013). Exploring elementary school teachers' strategies for including children with autism spectrum disorder in mainstream classroom classes. *International Journal of Inclusive Education, 18(2),* 101-122.

Majoko, T. (2013). Challenges in School Guidance and Counselling (SGC) services provisions for children with disabilities in Zimbabwean inclusive primary schools

Majoko, T. (2016). Inclusion of children with autism spectrum disorders: Listening and hearing to voices from the grassroots. *Journal of Autism and Developmental Disorders, 46(4),* 1429-1140.

Mandina, S. (2012). Bachelor of education in-service teacher trainees' perceptions and attitudes on inclusive education in Zimbabwe. *Asian Social Science, 8(13),* 227 – 232.

McGillicuddy, S., & O'Donnell, G., O. (2013). Teaching students with autism spectrum disorder in mainstream post-primary schools in the Republic of Ireland. *International Journal of Inclusive Education, 18(4),* 323-344.

McMillan, J.H., & Schumacher, S. (2006). *Research in education: Evidence-based enquiry.* New York: Pearson.

Mpofu, J., & Shumba, A. (2012). Challenges faced by students with special educational needs in early childhood development centres in Zimbabwe as perceived by ECD trainers and parents. *Anthropologist, 14(4),* 327-338.

Natof, T., H., & Romanczyk, R. G. (2009). Teaching students with ASD: Does teacher enthusiasm make a difference? *Behavioural Interventions, 24(1)*, 55-72.

Pantic, N. & Florian, L. (2015). Developing teachers as agents of inclusion and social justice. *Educational Inquiry, 6(3),* 331-351.

Robertson, K., Chamberlain, B., & Kasari, C. (2003). General education teachers' relationships with included students with autism. *Journal of Autism and Developmental Disorders, 23(2),* 123-130.

Sinz, C. T. (2004). Viewpoints and attitudes of teachers (k-5) who have students with Asperger's syndrome disorder. Menomonie: University of Wisconsin Stout.

Symes, W., & Humphrey, N. (2010). Peer-group indicators of social inclusion among pupils with autistic spectrum disorders (ASD) in mainstream secondary schools. *School Psychology, 31(2),* 123-130.b

Exploring Educators' Experiences Regarding Empathy within Inclusive Classrooms

Monique de Klerk,
Institute of Psychology and Wellbeing,
Werner de Klerk,
School of Psychosocial Health,
Community Psychosocial Research (COMPRES),
North-West University, South Africa,
(22668942@nwu.ac.za)

Abstract

An inclusive educational setting is a model in which educators must have empathic sensitivity, which will enable them to identify the different needs of the various learners. However, there is gap in research concerning educators' own experiences regarding empathy within inclusive classrooms. This qualitative study with a phenomenological research design thus aimed to identify, through the use of in-depth interviews, the educators' own empathic experiences within their inclusive classrooms in the Dr Kenneth Kaunda District in the North West Province, South Africa. A sample of seven female educators from three schools participated in this study. The data were analysed thematically, and the following main themes were identified: intrapersonal pre-proficiency of educators; interpersonal understanding for learners with disabilities; having adaptive skills; and situational aspects that play a role in the empathic experiences of educators. It was determined that future research should focus on more districts in order to gain better representations of the North West Province, also in other provinces to get a better representation of South Africa. In addition, a program must be developed in which educators are trained in the necessary empathic skills.

Keywords: *disabilities, inclusive education, full-service schools, educators, empathy, qualitative research*

Contextualisation

Section 29 of the Bill of Rights states all South Africans have the freedom to receive basic education (Dalton, 2012; Donohue & Bornman, 2014). There are several advantages to receiving basic education, including equal prospects for males and females, a reduction in hunger and poverty, and a better survival rate (Results, 2009). The Basic Education Coalition (2011) and Gehring et al. (2011) claim that basic education is an essential aspect of wellbeing, contributes to societal growth and promotes stability. Türkkahraman, (2012) believes that basic education can permit economic growth and community development, as well as empower learners with the necessary skills and abilities to contribute to societal issues. Basic education can be seen as a vital tool that broadens learners' knowledge and enhances their skill set (Türkkahraman, 2012), thus it is important that each learner has the opportunity to receive such education.

Inclusive education is arguably an ideal educational model, where the educational system is adapted for every learner (whether they have a disability or not) so that all receive equal education (Education White Paper 6, 2001). Dalton (2012) states that after the development of the Constitution of the Republic of South Africa in 1996, inclusive education was introduced in South Africa. According to the South African Department of Education (DoE, 2002), inclusive education entails respect towards every learner, despite their differences, by providing support to all learners in an attempt to promote successful learning. Furthermore, the goal of inclusive education is to assist all learners, including learners with physical, intellectual, social or emotional disabilities (Education White Paper 6, 2001; Mentz & Barrett, 2011). Inclusive schools can also be described as full-service schools, which, according to the South African Department of Basic Education (DBE, 2010), can be defined as mainstream educational facilities that aim to provide education to all learners, regardless of their needs. Such schools focus on equity, justice and quality, and aim to increase participation of all learners as well as reduce barriers to education (DBE, 2010). For the purpose of this study, inclusive education is defined as the educational process in which education and learning are provided to all learners, including learners with disabilities, within mainstream schools in the same classes by ensuring that each learner has an equal opportunity to learn the necessary skills.

Even though inclusive education serves as the ideal educational setting, and educational policy specifies that equal learning opportunities must be provided to all learners, Engelbrecht, Nel, Nel, and Tlale, (2015) claim that the reality of inclusive education has not yet been realised in many South African schools. This failure of application is largely a consequence of a lack in resources and facilities, as well as over-crowded classrooms (Engelbrecht et al., 2015). In addition, many educators hold negative attitudes towards inclusion, owing to the new demands on them and their time (Engelbrecht et al., 2015).

For the successful implementation of inclusion within classrooms, educators must therefore have empathy, which serves the foundation for learner care (Swan & Riley, 2015). Rogers (as cited in Elliott, Bohart, Watson, & Greenberg, 2011) defines empathy as the sensitive ability to understand a person's feelings from his or her perspective. According to Stojiljkovic, Djigic, and Zlatkovic, (2012), it is important that an educator has emotional stability and

empathic sensitivity. Empathic sensitivity helps educators create an atmosphere in their classroom in which every learner feels safe, involved and respected (Stojiljkovic et al., 2012). For the purpose of this study, empathy refers to one's ability to put oneself in another's emotional and cognitive situation, and act accordingly with support and understanding. Peck, Maude, and Brotherson (2015) claim that educators who embrace ,

responses of educators, in order to teach them to accept and accommodate each learner in their classrooms. Although various studies (see Barr, 2010; Batson, 2008; Burton, 2015; Decety & Cowell, 2014; Elliott et al., 2011; Hoffman, 2000; Kutlu & Coskun, 2014; McDonald & Messinger, 2012; Nakao & Itakura, 2009; Stojiljkovic, et al., 2012; Swan & Riley, 2015) focus on empathy in inclusive classrooms, none emphasise the importance of educators' own experiences regarding empathy within inclusive classrooms. Thus, these studies overlook the essential aspect of empathic responses from educators within an inclusive classroom. Indeed, as summarised by Barr (2010), educator empathy is a vital area that requires more study. It is this issue that this study aimed to address, and a phenomenological research design allowed us to collect rich data and identify and describe empathy within an inclusive educational setting.

Goal of the Study

This qualitative study with a phenomenological research design aimed to identify and describe educators' own empathic experiences in inclusive classrooms in the Dr Kenneth Kaunda District in the North West Province, South Africa. Therefore, the following research question directed this study: *What are educators' experiences regarding their own empathy within inclusive classrooms?*

Method of Investigation

Research Method

In this study, a qualitative research method was used. Nieuwenhuis, (2016a) describes qualitative research as a descriptive method in which the process, meaning and comprehension of obtaining information through words are vital to the researcher when studying social phenomena. The qualitative research method was appropriate for the purpose of this study as it enabled the researcher to gain an in-depth understanding of the phenomenon of empathy within an inclusive setting, and thus provide insight into the lived experiences of educators' empathy within inclusive classrooms.

Research Design

A phenomenological research design was used for this study as it provided the researchers with the opportunity to acquire an in-depth understanding of the subjective experiences of the participants regarding a specific phenomenon (Nieuwenhuis, 2016b), i.e. the lived experiences of educators' own empathetic experiences within an inclusive classroom. According to Nieuwenhuis, (2016b, p. 78), "like other qualitative designs, phenomenology is popular in the social and health sciences, but also in education research".

Participants and Research Context

To meet the aim of the study, the participants had to comply with certain criteria. The educators had to be employed at a school within the Dr Kenneth Kaunda District, which is situated in the North West Province, South Africa. This educational setting had to be inclusive, where education is provided to learners without disability along with those who suffer from a visual disability (impaired vision), hearing disability (impaired hearing), cognitive disability (problems with learning), or physical disability (impaired mobility). Furthermore, the educators also had to be willing to participate by signing the informed consent form, be able to speak either English or Afrikaans, have one year of teaching experience within the inclusive educational setting, and be registered as a qualified educator at the Education Association of South Africa. The educators were informed about this study via the principals who served as gatekeepers. The contact details of the mediator (the independent person within this research inquiry) were given to the participants by the principals, which allowed the participants to contact the mediator if they were interested in participating. The final research sample was seven educators who voluntarily participated in this study, all of whom were women, from three schools in the district. Six of the seven educators were White, and one was an Indian woman. Their years of experience in teaching and in inclusive education varied (seeTable 1).

Table 1. Demographic Information of Participants

Participant number	Age	Race	Home language	Years of experience in teaching	Years of experience in inclusive education
P1	51	White	English	29 years	5 years
P2	51	White	Afrikaans	22 years	5 years
P3	46	White	English	17 years	8 years
P4	47	White	English	23 years	20 years
P5	59	White	Afrikaans	26 years	11 years
P6	30	Indian	English	9 years	2 years
P7	55	White	Afrikaans	20 years	2 years

Data Collection

As already mentioned, a phenomenological research design (see Nieuwenhuis, 2016b) was used in this study, where the researcher aimed to understand educators' empathic experiences regarding a specific phenomenon, i.e. inclusive classroom. Different data collection methods were used. Firstly, a *demographic questionnaire* was used to gather the basic information of the participants and included questions that established the participants' age, ethnicity, teacher qualification(s), years of teaching experience, as well as years of teaching at specific school. Secondly, an *in-depth interview* was conducted that provided the participants with the opportunity to share their lived experiences regarding their own empathy in an inclusive classroom. According to Greeff (2011), sharing one's experiences concerning a specific phenomenon entails a meaning-making process in which the researcher explores and tries to understand the participants' perspectives or experiences of a certain idea or situation. The in-

depth interview was best suited for the purpose of this study, as it allowed the researcher greater flexibility in asking the participants questions, who were then able to give a fuller account of their lived experience. It also provided the opportunity for probing and clarification (Nieuwenhuis, 2016b) in order to get the best possible understanding about the empathic experiences of the educators within inclusive classrooms.

In order to achieve the aim of this study, two open-ended questions were asked during the in-depth interview: the first was to address the experiences of each participant regarding her own empathy within inclusive classroom, and the second addressed the contexts or situations that have typically influenced or affected her experiences regarding her own empathy within the inclusive classroom. These two broad questions were in accordance with the guidelines provided by Moustakas (1994, as cited in Creswell, 2007) for asking in-depth interview questions that are appropriate for the phenomenological research design. The definition of empathy (i.e. an individual's ability to put oneself in another's emotional and cognitive situation, and act accordingly with support and understanding) used for the purpose of this research inquiry was provided and explained to each participant prior to the in-depth interview.

Lastly, the researchers made use of *field notes*. The use of field notes was necessary in ensuring the "bracketing" that is essential for phenomenological research (see Nieuwenhuis, 2016b). Bracketing is where researchers set aside their own experiences "to take a fresh perspective towards the phenomenon" (Nieuwenhuis, 2016b, p. 78). The researchers thus made use of field notes throughout their research process (data collection and analysis) as part of their "bracketing" process.

Data Analysis

The data collected through the in-depth interviews was transcribed verbatim prior to thematic analysis. Thematic analysis, according to Clarke and Braun (2013), can be described as the process in which data is studied thoroughly through reading, coding and identifying themes. This process enabled the researchers to follow a structured and chronological method, which in turn increased the level of trustworthiness (Morgan, 2013). The researchers continuously focused on the empathic experiences of the educators in inclusive classrooms by reviewing the description of the terms (empathy and inclusive classrooms) throughout the analysis.

Thematic analysis in this study consisted of the following steps (Clarke & Braun, 2013): firstly, the researchers familiarised with the data by actively reading and re-reading through the data and transcribing it verbatim. Secondly, codes were created according to significance. Thirdly, possible themes were highlighted from the codes and categorised under an overarching theme. Next, the researchers revised the themes by making them significant to the data. The last phase of thematic analysis required the researchers to label the themes and identify possible subthemes for each theme. According to Nieuwenhuis, (2016b), as part of the phenomenological research process, once the themes have been identified, the researcher must develop the following: a textual description of what the participants experienced; a structural description of the participants' experiences regarding how they experienced the phenomenon in terms of conditions, situations and/or context; and "a combination of the textual and structural descriptions to convey an overall essence of the experience" (Nieuwenhuis, 2016b, p. 78).

Trustworthiness

Trustworthiness was ensured by following the model of Lincoln and Guba provided by Krefting (1991), which motivated the researcher to focus on four aspects. The first aspect is truth value, which establishes confidence and credibility in the researchers findings about the context and themes presented by the participants (Krefting, 1991). The researchers had to be truthful about the data collected regarding the lived experiences of the educators' empathy in inclusive classrooms, and present accurate interpretations thereof (Krefting, 1991). Truth value was ensured by accurate verbatim transcriptions of the data collected, active engagement with the data (code and re-coding of all the data), and making use of a co-coder (a registered research psychologist within the School of Psychosocial Health, North-West University, South Africa). The second aspect of Lincoln and Guba's model is applicability. In this study, the researchers presented the methodology in a comprehensive and detailed manner to aid in future research. The third aspect, consistency, was ensured by the researchers through asking prepared questions in the interview stage of data collection stage. The final aspect is neutrality, which requires the researchers to be objective (Schurink, Fouché, & De Vos, 2011). Neutrality was achieved by only focussing on the information provided by the participants, and not integrating the researchers own perspectives and motivations (Krefting, 1991) via bracketing, making sure that the data collected supported any interpretations and conclusions made. The researchers also made use of an audit strategy (record keeping) to ensure objectivity.

Ethical Considerations

Ethical approval for this study was obtained from the Health Research Ethics Committee (HREC) of the North-West University (NWU-00342-16-A1), South Africa, as well as from the District Director of Education and Sport Development, Dr Kenneth Kaunda District, North West Province, South Africa.

After approval was obtained from all relevant legal parties, schools (principals) and governing bodies were approached for permission to conduct the research study at their schools. After permission was received, the researchers assigned a mediator who provided the educators (participants) with a consent form to complete if they agreed to participate in the study. Both the participant and the mediator signed the consent form in each other's presence. An eyewitness was also asked to sign the consent forms.

Ethical considerations were taken into account by communicating to each participant the importance of confidentiality and ensuring that no personal details would be made public. In addition, the anonymity of each participant was maintained at all times by assigning each one a participant number during the data analysis process. It was also made clear to the participants that they could withdraw from the study before data analysis if they wished. The principal at each school provided an available and appropriate room for the purpose of conducting the in-depth interviews. These rooms provided a comfortable, familiar and safe environment for the participants. Finally, safe keeping of all data and findings is the responsibility of the North-West University (South Africa).

Findings

Through the process of thematic analysis, four core themes (educators' experiences of their own empathy: themes 1 to 3; and situational aspects that played a role: theme 4) with subthemes (see table 2) were identified. The appropriate verbatim quotations were also provided as support for the themes.

Table 2

Themes and Subthemes Regarding Educators' Own Empathic Experience within Their Inclusive Classrooms

Theme 1:	**Intrapersonal proficiency of educators**
Subthemes:	1.1 Having certain character traits
	1.2 Portraying a power role
	1.3 Decrease in self-confidence by feeling that they do not have enough empathy
Theme 2:	**Interpersonal understanding for learners with disabilities**
Subthemes:	2.1 Earning the learners' trust
	2.2 Motivating and acknowledging the learners
Theme 3:	**Adaptive teaching skills**
Subthemes:	3.1 Differentiating between the different needs of the learners
	3.2 Having a creative teaching approach
Theme 4:	**Situational aspects playing a role in the empathic experiences of educators**
Subthemes:	4.1 Facilities and support
	4.2 Time constraints
	4.3 Lack of learner discipline
	4.4 Parental influence
	4.5 Household issues influencing educators' empathy
	4.6 Empathy being influenced through educational experience
	4.7 Empathy being influenced after educators have become mothers

Theme 1: Intrapersonal Proficiency of Educators

During the data collection process, it was apparent that certain intrapersonal aspects played an important role in the empathic experiences of educators. These intrapersonal aspects can be explained as having certain character traits that enabled the participants to be empathic, as well as to portray a power role. However, some participants believed that they experienced a

decrease in self-confidence because they did not feel as if they had enough empathy for the different learners in their classroom.

Having certain character traits. Having certain character traits was reported as playing a vital role in the empathic experiences of educators in their inclusive classroom. One participant stated the following regarding empathy for learners with disabilities:*"[...] So for a long time I had a heart for children who struggle, who really struggle [...] But I often feel the pain of others very easily and I can put myself in the same situation"* (P1). Two other participants added that, *"I think you must have it in your heart"* (P2) and that *"[...] what we do here comes from our hearts"* (P7).

Other character traits that were mentioned by the participants include having patience as well as passion, as noted by one participant: *"This position allows me to have more patience"* (P1). Another said that, *"You must definitely have the patience and a passion for people because if you don't have passion for people's children, then it doesn't help that you are a teacher"* (P3). In addition, it is necessary to be emotionally available for the learners, as specified by one participant, who stated that, *"I get very emotionally involved and I get a lot of criticism, I know, but I feel that's the only way I reach the children [...] I easily get emotionally involved and I feel it makes me a better teacher"* (P3). Another participant said,

> *I will always tell a child to come to me during break if I observed something, or [...] I will sometimes just, I do this often, sometimes a person can just see that a child hasn't had a good day today, then [...] I write a note and then in passing just put it in the child's pencil case [...]* (P5).

Furthermore, some participants stated that inquisitiveness also seems vital in order to experience empathy in their classroom: *"To understand them and to want to work with people, want to find out and want to know about them [...] The fact that I can understand and I want to know what the conditions are at home"* (P3). Also, to be committed serves as an opportunity for educators to be empathic towards the learners in their classroom, as seen in the following statements: *"You can have how many prescriptions and documents that tell you what to do, but [...] [you have to be] committed [...]"* (P2), and that *"I search images mainly from a point of view; I look for apparatus and stuff like that [...] You can't stop and say you know everything"* (P1). Therefore, it appears as if these character traits helped the participants to understand the learners and their situations.

Portraying a power role. Certain rules and boundaries need to be set, and the teacher needs to fulfil a power role to encourage or discipline a learner, as noted by one participant, who reported that, *"[...] the boundaries that I set [...] you take a parental position first before you can even take a teachers role"* (P1). Another participant said, *"[...] as an educator, I don't think we realise the influence we can have on the total development of a child [...] we are in a position, and we might say or do something that could hurt or damage a child"* (P4). Additionally, rules play an essential role, as specified by one participant: *"On my class rules, there is a lot of stuff, but the most important is: believe in themselves, never give up"* (P7). Hence, it is important that educators realise the influence they can have on the learners, and the tremendous power they have to build or undermine a learner's confidence.

Decrease in self-confidence by not feeling adequate. It was evident that some participants do not feel good enough as educators, because of all the demands that are placed on them. This observation is supported by a participant, who stated that,

> *[…] at times you go home feeling I achieved nothing today and all I did was moan and correct […] I often thought that maybe I'm not good enough as a teacher and that I don't do enough […] There's far more that I can do […]* (P1).

Another participant observed, *"[…] the pressure and extra admin and extra stuff we have, I feel that I am no longer a good teacher, because I don't have the empathy that I had when I began."* (P3). Therefore, educators who feel inadequate owing to their feelings of not doing enough or having too much work results in them experiencing a decrease in self-confidence.

Theme 2: Interpersonal Understanding for Learners with Disabilities

During data gathering, it was evident that the participants showed understanding of the learners' situations by trying to earn the learners' trust, and trying to create an environment in which the learners were acknowledged and motivated to learn.

Earning the learners' trust. It was apparent to most participants that earning the trust of their learners enables them to experience empathy, as mentioned by one participant: *"You must win their trust, because […] we actually live in such a broken world that there are so few people that children can really trust […]* (P2). For another participant, it was necessary to earn the trust of the learners in order for the learners to be able to open up: *"But I just feel it's the only way I get to the children [learners], and you build their trust […] and as they learn to trust you, they open up…"* (P3). Hence, earning the learner's trust enables the participants to show interpersonal understanding of the learners' situation.

Motivating and acknowledging the learners. To acknowledge and motivate the learners and to empower them seem to play important roles for the participants regarding how they deal with the various academic abilities of their learners, as stated by one participant: *"You have to get them [learners] to decide for themselves [make own choices]"* (P1). In addition, one needs *"[…] to praise and really try to motivate them […] and that motivation helps them to be more self-assured […]"* (P2). Another participant said that one should motivate the learners to work to the best of their academic capabilities: *"[…] most of the time I try to get them feel a little bit of pressure so that they motivate themselves to work on the same pace as the classroom"* (P6). To continue to motivate the learners and reinforce positive academic performance, one participant said, *"[…] I motivate my [learners] with gold stars […] so I try to motivate each one on their level […] and I think it is very important to keep boosting it"* (P7). Participant 5 noted the importance of acknowledging the learners: *"[…] say to a child in the morning 'your hair looks nice' […] and sometimes give [them] a hug […] and if I know a child has excelled […] I will go out of my way to congratulate them"* (P5). Evidently, most participants considered motivation and acknowledgment as important for empowering the learners.

Theme 3: Adaptive Teaching Skills

The data gathered also showed that participants' experience of empathy inspired them to adapt to the new educational environment of inclusion. They did so by differentiating between

the learners' different needs, and developing a creative teaching approach in order to comply with their different needs.

Differentiating between the different needs of the learners. One participant emphasised the uniqueness of every learner, stating that, *"We do a lot of differentiation [...] within the class because of inclusion [...] So in my class especially, you try because everyone is different"* (P3). Some participants focussed on differentiating by providing suitable learning materials appropriate to each learner's need, as indicated by one participant who claimed that she *"...[had] another [learner] who is partially sighted [...] for example I enlarge things [worksheets] for her"* (P2). Another participant said, *"[...] with the worksheets I make an adjustment [...] I would do an alternative assessment, so I will perhaps ask verbal questions and I am going to test the skill, not the work [...]"* (P4). Thus, differentiation plays a vital role for educators, helping them to adapt to learners' needs and provide the relevant learning material.

Having a creative teaching approach. Adapting their teaching approach in order to meet the different needs of each learner motivates most participants to think creatively. One participant said that, *"We come to the class, and then I go back to the very concrete [...] It's a constant repeat: finding different ways, creative ways of trying to get them see that even games work wonderfully [...]"* (P1). Another participant pointed to identifying innovative ways to convey the work in a comprehensive manner:

> *[...] you got to play around and you got to be open to look for different options and I do a lot of Google [...] So then we need to make ourselves available to find ways to make it understandable to them and that's not always easy* (P1).

Additionally, it seemed vital for the participants to be inventive, for example, *"[we] put music on and we do a lot of movement [...] I have a trampoline at the back"* (P3). Another technique is to make use of visual aids: *"I love the projector and showing them videos, and actually for children with barriers the videos work so well [...] In the beginning I also played music [...] and I believe in a lot of visual work with our learners"* (P6). Yet another participant said, *"I believe in a lot of visual work with the learners [...] I work a lot on the carpet for them to feel and touch"* (P7). Participant 7 went on to note the importance of focussing on the reality of the learners: *"[...] everything we do we must pull it through to the reality. The other day we did an advertisement [...] I had to teach them what a slogan means, and when I said 'finger liking good', they immediately answered KFC"* (P7). Therefore, educators are able to adjust to the new educational system of inclusion by adapting their teaching style through differentiation and being creative.

Theme 4: Situational Aspects Playing a Role in the Empathic Experiences of Educators

During the in-depth interview it became clear that there are certain situational aspects that play a role in the educators' empathy within their inclusive classrooms. These situational aspects include: facilities and support, time constraints, lack of learner discipline, parental interference, household issues of educators, empathy being influenced through educational experience, and empathy being influenced after educators have become mothers.

Facilities and support. It was evident that most participants' empathy is influenced by facilities provided by and support from the Department of Education. One participant voiced her frustration with the lack of facilities and support provided, stating that,

[…] now we're a mainstream school and that label, that etiquette of you are now an inclusive school, [is] forced upon us. Because actually we don't have the facilities to do that [such as] hearing aids […] we were supposed to have assistance [such as] occupational therapists, and psychologists, and everything at your disposal, but none of that is here […]. How do you cope with that in a big class without an assistant? (P1)

In contrast with the above, another participant from a different school indicated that, *"We are now very happy that the Department has helped us. They gave us money to buy [some] stuff […] but they also said that they would send us an occupational therapist or a psychologist"* (P4). Thus, a lack of facilities and support can cause a lot of frustration; the provision thereof allows educators to provide the best teaching environment for the learners.

Time constraints. Data showed that several participants experienced frustration regarding the time constraints in accordance with their work demands. One participant said,

I mean, the teachers then have to accommodate for one learner: change a worksheet, change her whole way of doing things to make it easier for her […] You don't always have the time and the places available, or you've got other stuff on your desk that you have to do […] (P1).

Also, there is additional pressure placed upon educators to complete their assessments in a limited amount of time. One participant complained of *"[…] the pressure and extra admin and the extra stuff that we have"* (P3). Another participant admitted that the unreliability of the education system negatively impacts the learners. She said, *"Our education system is letting the children down [...] they are expecting a whole lot of work, a lot of paperwork, a lot of double work"* (P4). Importantly, one participant believed that not having enough time impacts her ability to feel empathy: *"people don't have time to get to everything. I think it is one of the […] empathy thieves"* (P2). Another participant elaborated: *"I think also the time constraint is one of the main things that would probably influence our empathy towards the children […]. The amount of work content to be covered in a certain period of time […] definitely frustrating most of the time"* (P6). Thus, a lack of time for the amount of work that is expected of educators seems to be a frustration, which negatively influences their empathy.

Lack of learner discipline. According to the data gathered, the lack of discipline among learners greatly influences the participants' empathy within their inclusive classrooms. One participant voiced her frustration, stating that a lack of discipline deprives her of her empathy: *"...If there is no discipline […] it steals my empathy that I should have for the [learner]"* (P2). Another participant also pointed to discipline: *"[…] disobedient children [learners] I think have a great influence [on empathy]* (P5). Evidently, the lack of discipline among learners causes some participants to feel frustrated and prevents them from focussing on the learners.

Parental influence. According to most participants, the role that parents play influences their empathy in a negative manner. For one participant, *"Parents interfere tremendously […]. I've had the most parental interference that I have had to deal with in all my teaching years"* (P1). Moreover, *"No parent cooperation makes you lose empathy […]"* (P3), and *"[…] a lot of the time they're reluctant to help […] that's the biggest challenge we're dealing with"* (P6). One participant, however, realised that support from the parents can aid in her empathic experiences:

"[…] You must have a good relationship with the parents. You go much further if you work with them [parents] [...]. Have a good relationship with the parents and the child" (P4). Thus, according to the participants, parents play a very important role and can have a definite influence on their own empathy.

Household issues influencing educators' empathy. Participants' personal responsibilities at home also play a role in their empathy, as noted by one participant: *"I think your own household circumstances also play a role because […] if I […] am stressed, my empathy levels are low"* (P3). Another participant pointed to the personal roles one must fulfil at home as well: *"[…] you have responsibilities, your personal responsibilities, your family and things you need at home"* (P6). Thus, the personal responsibilities educators have in their lives outside school also influence their empathy towards the learners, either positively or negatively.

Empathy being influenced through educational experience. It was clearly stated by one participant that her empathy only started to develop with teaching experience: *"I think with my age I also became more empathic […] when I was younger I mainly focused on teaching my subject"* (P5). Her educational experience thus aided in her development of empathy in her classroom.

Empathy being influenced after educators had become mothers. It was apparent that one participant had low levels of empathy, which was enhanced until she herself became a mother:

> *I actually as a start off teacher, I did not have that much empathy […]. And I actually started in a sense to realise that this is somebody's child […]. And I think as time goes by like now, I have a lot of sympathy and empathy for children who struggle* (P4).

She further explained that,

> *Because I felt that was not what I studied to do. I did not study to go beyond the call of duty and then I came here and I've learned to make a lot with a little bit of stuff […]. When I had my own children it made a big difference because I didn't have empathy towards other people's children […]. This is what I studied to do and this is what I am going to do. I ignored the children that struggled and it was wrong of me I think that now I feel really bad about it* (P4).

Another participant also explained the effect of having a child with a disability and how it influences her empathy, explaining that, *"I have a son who has Asperger [Syndrome] and I think that opened my eyes […]"* (P7). It is clear that these two participants have developed empathy as part of both their experience in their inclusive classrooms, as well as in their personal lives.

Discussion

This qualitative study with a phenomenological research design aimed to identify educators' own empathic experiences in inclusive classrooms in the Dr Kenneth Kaunda District in the North West Province, South Africa. The following research question directed this study: *What are educators' experiences regarding their own empathy within inclusive classrooms?*

The educators had several experiences regarding empathy in their inclusive classrooms. Previous research done by Zeiger (2016) found that focusing on certain traits that an educator must have serves as an opportunity to create a suitable environment for the learners. Zeiger's finding was confirmed by this study, as participants noted that certain traits must be present within educators. In addition, Kelly (2017) claims that along with these traits, educators have a power role, which has a large influence in the lives of learners. This claim was also supported by the study's findings, as educators emphasised the power role they have in the lives of their classroom learners, whether it be through their words, actions or the classroom rules they set.

Yet despite having certain traits and a power role, educators still might experience low self-confidence owing to several factors. According to Mach,i (2007), educators feel a decrease in their self-esteem because of their unwillingness to find new ways to help learners with barriers to learning. Research done by Chimhenga, (2016) concurs, finding that educators' lack of confidence makes them feel inadequate to teach learners who experience barriers to learning. This research study supported this finding, as participants noted that because of their own personal deficiency, they do not feel good enough as educators, and feel that they must do more in order to feel adequate.

Alrubail, (2015) emphasises the importance of educators creating a trusting relationship with the learners, which is verified by the study's findings. A trusting relationship aids in the understanding of the learner as a whole, including why the learner acts in a certain manner. Zeiger (2016) not only affirms the importance of creating a trusting relationship with the learners, but also states why it is necessary to motivate the learners. Weimer (2013) argues that motivation helps the learners to achieve the necessary outcomes, while Magare, Kitching and Roos, (2010) believe that educators who focus on the successful outcomes of the learners encourage them to progress by reinforcing their successes. In this current study, participants stated that they try stimulating the learners by motivating them to work according to their own pace, and also encourage their growth by giving them gold stars.

Differentiation between the different needs of the learners also serves as a motivation for the educators to experience empathy. According to Thakur (2014), differentiation is an important tool in inclusive classrooms, requiring educators to restructure their classroom and ways of teaching. Differentiation can be seen as an effective and creative strategy that enables learners, despite their needs, to receive the appropriate education (Thakur, 2014). Magare, et al. (2010) add that educators must intentionally adjust their teaching approach in order to provide a suitable learning environment for all learners. Participants in this study acknowledged the importance of differentiation by drawing attention to the need in the inclusive classroom to first do an assessment of the child's needs, and then to provide learning opportunities according to each learners' ability. The participants also highlighted the necessity to enlarge the font of some learners' worksheets and to handle each learner according to their individual abilities.

Several situational aspects were also reported to play a role in the educators' experience regarding their empathy in the classroom. For instance, facilities and support serve as situational factors. According to Roux (2014), the absence of appropriate school facilities serves as a major challenge. Naicker (2006), Roux (2014) and Schoeman (2012) add that a lack in proper infrastructure and resources at schools prohibits the accommodation of all learners with different types of disabilities. Moreover, inadequate lighting or an excess of loud noise prevents learners with hearing and visual difficulties from fully participating in class (Graham, 2014). In this

study, the participants admitted that resources, facilities and support play a vital role in their experiences regarding empathy. The participants' frustration was evident if their school was not fully equipped with the necessary resources to accommodate learners with disabilities. In contrast are the views of those participants who worked at a school where the vital resources are provided by the Department of Education. Thus, facilities and resources influence the empathic experiences of educators within their inclusive classrooms.

Other relevant factors are time constraints and lack of learner discipline. Time constraints can cause educators to foster a negative attitude towards inclusion, as stated by Engelbrecht et al. (2015) and confirmed by the participants in this study. They pointed out their dissatisfaction at not being able to complete all their work in the limited amount of time that is provided to them. One participant also stated that there is not enough time for the number of assessments that educators are expected to do within their classrooms. A lack of learner discipline also leads to difficulties being experienced by educators in managing their classrooms (Nisreen, 2013). In this study, the participants explained their frustration at the disobedience of learners who interrupt their classrooms.

Factors outside the classroom also influence the empathic experiences of educators. According to Mare (2014) and Magare, et al. (2010), parental influence plays a significant role in the academic performance of the learner. In a study done by Johnson and Descartes (2017), they claim that all parents try to influence their children's studies. Participants in this study also showed that parental influence plays an important role in educators' empathic experiences. According to the participants, if the parents work cooperatively with the educators, it will aid in the learning process of the learners. Another outside factor is household issues. According to Lynch (2015), some educators find it difficult to keep their personal life separate from their work life, which may cause educators to become tired. Indeed, in this study participants admitted to experiencing a change in their empathic experiences after a troublesome night at home, or having personal responsibilities.

Previous experience with inclusive education is also a factor in the theme of personal experience in the inclusive classroom. Bradshaw and Mundia, (2006) claim that educators who have had previous experience with inclusive education are more likely to maintain a positive attitude regarding the inclusion of all learners. In this study, participants stated that they became more empathic as they gained educational experience. Similarly, the empathic experiences of educators can be influenced by their role as mothers. Thomas (2015) states that having children can motivate an educator to be prouder of the good work learners do and to motivate them to achieve what they can. This assertion was confirmed by the participants, who claimed that their empathy had grown since they had children of their own. Such empathy is important, for, as Konrath and Grynberg, (2013) emphasise, high levels of empathy can lead to prosocial behaviour, where an individual learns to help others. Therefore, educators with high empathy levels are able to understand the learners' needs.

Limitations and Recommendations

Limitations of this study include the small number of participants – all of whom were female educators. Moreover, the majority (six) were White, and one was Indian. Thus the sample shows limited variation, which makes generalisation to the broader Dr Kenneth Kaunda District, North West Province (South Africa) not possible, as is not representative of all gender and ethnic

groups in the district. Furthermore, most schools that are listed as full-service schools in the Dr Kenneth Kaunda District are not inclusive, and only three full-service schools were willing to participate, of which only one had the necessary facilities.

Possible recommendations for further research regarding this topic include focussing on more than one district, because of the limited number of schools actually complying with the criteria of a full-service school. Doing so would allow the researchers to possibly interview more educators, from a variety of age groups, gender and race, which will provide a more in-depth perspective on the empathic experiences of educators within their inclusive classrooms. Furthermore, it is recommended that a possible program be put in place that teaches educators the necessity of empathy in the inclusive classroom. This program can also include training to provide the essential skills for educators to apply in their inclusive classroom. Because empathy can be seen as a core element in the inclusive classrooms, where learners are considered as individuals with unique needs, it is necessary that further research is done in order to ensure that each educator is equipped with the vital empathy skills to accommodate these learners' needs.

Conclusion

The aim of this research study was to identify educators' own empathic experiences in inclusive classrooms in the Dr Kenneth Kaunda District in the North West Province (South Africa). The researchers found that empathy plays a vital role in the educational experiences of educators within their inclusive classrooms. In addition, there are also situations and factors that influence such experiences. The empathic experiences of educators within their inclusive classrooms, which were explicitly specified in the findings of this study and substantiated by other literature, include the educators' ability to have intrapersonal proficiency; the educator's ability to show interpersonal understanding for learners with barriers; the educator having adaptive teaching skills; and situational aspects that play a role in the empathic experiences of educators.

Empathy can be identified as a fundamental aspect in education, where educators are thus motivated to acknowledge every learner, with or without a barrier to learning, and help to fully understand their needs in order to provide the necessary education and equal learning opportunities to all. Educators in inclusive schools have been identified as the population group on which future researchers must focus, mainly because educators within an inclusive educational setting endure a variety of situations that impact on their educational experience. Also, educators can be seen as key in the transference of knowledge and skills to the learners, and need empathy to do so in a suitable manner, and according to each learner's need. Programs teaching the importance of empathy and conveying empathic skills are necessary in the training of each educator.

References:

Alrubail, R. (2015). *The heart of teaching: What it means to be a great teacher*. Retrieved   from http://www.edutopia.org/discussion/heart-teaching-what-it-means-be-great-   teacher.

Barr, J. (2010). The relationship between empathy and perceptions of school culture.   *Educational Studies, 37*, 365–369.

Basic   Education   Coalition.   (2011).   *Why   is   basic   education   so   important?*   Retrieved   from http://www.basiced.org/wp-content/uploads/Factsheets/Why_Basic_Education- 2011.pdf.

Batson,   C.   D.   (2008).   *Empathy-induced   altruistic   motivation.*   Retrieved   from http://portal.idc.ac.il/en/symposium/herzliyasymposium/documents/dcbatson.pdf.

Bradshaw, L., & Mundia, L. (2006). Attitudes and concerns about inclusive education: Bruneian inservice and preservice teachers. *International Journal of Special Education, 21*(1), 35–41.

Burton, N. (2015). *Empathy versus sympathy.* Retrieved from https://www.psyc hologytoday.com/blog/hide-and-seek/201505/empathy-vs-sympathy.

Chimhenga, S. (2016). Attitudes of teachers towards students with disabilities in mainstream   classes: The case of teachers in some selected secondary schools in Zimbabwe. *Asian   Journal of Education Research, 4*(4), 36–41.

Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The Psychologist, 26*(2), 120–123.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Dalton, E. M. (2012). The implementation of inclusive education in South Africa: Reflections arising from a workshop for teachers and therapists to introduce universal   design for learning. *African Journal of Disability, 1*(1), 1–7.

Decety, J., & Cowell, J. (2014). The complex relation between morality and empathy.   *Trends   in   Cognitive Sciences, 18*(7), 336–339.

Department of Basic Education (DBE). (2010). *Guidelines for full-service/ inclusive schools.* Retrieved from http://www.thutong.doe.gov.za/ResourceDownload.aspx?id=44323.

Department of Education (DoE). (2002). *Implementing inclusive education in South Africa: True stories we can learn from.* Retrieved from http://www.thutong.doe.gov. za/resourcedownload.aspx?id=37391.

Donohue, D., & Bornman, J. (2014). The challenges of realising inclusive education in   South   Africa.   *South African Journal of Education, 34*(2), 1–14.

Education White Paper 6. (2001). *Special needs education: Building an inclusive education   and   training system.* Retrieved from http://www.education.gov.za/ LinkClick.   aspx?fileticket=gVFccZLi/tl=.

Elliott, R., Bohart, A. C., Watson, J. C., & Greenberg, L. S. (2011). Empathy. In J. Norcross (Ed.), *Psychotherapy relationships that work* (pp. 132–152). New York, NY: Oxford University Press.

Engelbrecht, P., Nel, M., Nel, N., & Tlale, D. (2015). Enacting understanding of inclusion in   complex contexts: Classroom practices of South African teachers. *South African Journal of Education, 35*(3), 1–10.

Gehring, K., Irfan, M. T., McLennan, P., Moyer, J. D., Selebalo, H., & Torkelson, E. (2011).   *Knowledge empowers Africa: The benefits of increased investment in education.*   Retrieved fromhttp://www.hss.de/fileadmin/suedafrika/downloads/011211_ISS_   AF_PB_Knowledge.pdf.

Graham,   N.   (2014).   *Children   with   disabilities.*   Retrieved   from   http://allinschool.org/wp-content/uploads/2015/01/OOSC-2014-Children-with-Disabilities-final.pdf.

Greeff, M. (2011). Information collection: Interviewing. In A.S. De Vos, H. Strydom, C. B. Fouché, & C. S. L. Delport (Eds.), *Research at grassroots: For the social sciences and human service professions* (3rd ed., pp. 286–313). Pretoria, South Africa: Van Schaik.

Hoffman, M. L. (2000). *Empathy and moral development: Implications for caring and   justice.* Retrieved from http://catdir.loc.gov/catdir/samples/cam032/99029669.pdf.

Johnson, E. J., & Descartes, C. H. (2017). Parental influence on academic achievement   among the primary school students in Trinidad. *Early Child Development and Care,   187*(7), 1221–1227.

Kelly, M. (2017*). Impact of teacher's words and actions: The importance of teachers in their   students'   lives.* Retrieved from https://www.thoughtco.com/impact-of-words-and-   actions-8321.

Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *The American Journal of   Occupational Therapy, 45*(3), 214–222.

Konrath, S., & Grynberg, D. (2013). *The positive (and negative) psychology of empathy.* Retrieved   from https://www.ipearlab.org/media/publications/Konrath_Grynberg   _2013.pdf.

Kutlu, A., & Coskun, L. (2014). The role of empathy in the learning process and its fruitful   outcomes: A comparative study. *Journal of Educational and Social Research, 4*(2),   203–207.

Lynch, M. (2015). *The private life of a teacher: Should it be grounds for dismissal?* Retrieved from   http://www.theedadvocate.org/the-private-life-of-a-teacher-should-it-be-grounds-for-dismissal/

Machi, C. Z. (2007). Attitudes of selected groups of teachers towards inclusive education (Unpublished doctoral   dissertation). University of Zululand, KwaZulu-Natal, South Africa

Magare, I., Kitching, A. E., & Roos, V. (2010). Educators' experience of inclusive learning   contexts: An exploration of competencies. *Perspectives in Education, 28*(1), 52–63.

Mare, L. L. (2014). *The facts of education: How does parent involvement in education   affect   children's learning?* Retrieved from http://www.cea-ace.ca/blog/lucy-le- mare/2014/09/1/facts-education-how-does-parent-involvement-education-affect-   childrens-l.

McDonald, N. M., & Messinger, D. S. (2012). *The development of empathy: How, when, and   why*.   Retrieved fromhttp://www.psy.miami.edu/faculty/dmessinger/cc/rsrcs/emot   /McDonald-MessingerEmpathy%20Development.pdf.

Mentz, K., & Barrett, S. (2011). Leadership and inclusive education in South Africa and   Jamaica: A   comparative analysis. *International Sports Engineering Association,   39*(1), 33–48.

Morgan, D. L. (2013). Focus groups as qualitative research: Planning and research design for focus groups. *Sage   Research Methods*, 32–46.

Naicker, S. (2006). From policy to practice: A South African perspective on implementing   inclusive education policy. *International Journal of Whole Schooling, 3*(1), 1–6.

Nakao, H., & Itakura, S. (2009). An integrated view of empathy: Psychology, philosophy, and neuroscience.   *Integrative Psychological Behaviour, 43*, 42–52.

Nieuwenhuis, J. (2016a). Introducing qualitative research. In K. Maree (Ed.), *First steps in research* (2nd ed., pp.   50–69). Pretoria, South Africa: Van Schaik Publishers

Nieuwenhuis, J. (2016b). Qualitative research design and data-gathering techniques. In K. Maree (Ed.), *First steps   in research* (2nd ed., pp. 72–100). Pretoria, South Africa: Van Schaik Publishers.

Nisreen, A. (2013). The pros and cons of inclusive education from the perceptions of   teachers   in   the   United Arab Emirates. *International Journal of Research Studies in   Education, 2*(1), 55-66.

Peck, N. F., Maude, S. P., & Brotherson, M. J. (2015). Understanding preschool teachers'   perspectives   on empathy: A qualitative inquiry. *Early Childhood Educational Journal, 43*, 169-179.

Results. (2009). *Why education matters*. Retrieved from http://www.results.org/ images/uploads/files/why_education_matters_11_04_09.pdf.

Roux, M. (2014). Reasons for including/excluding learners with permanent mobility impairments in mainstream high schools in East London (Unpublished doctoral dissertation). University of Stellenbosch, Stellenbosch, South Africa.

Samuel, R., & Erten, O. (2015). Teaching in inclusive classrooms: The link between teachers' attitudes, practices and student outcomes. *Journal of Psychology and Psychotherapy, 5*(6), 1–7.

Schoeman, M. (2012). *Developing an inclusive education system: Changing teachers' attitudes and practices through critical professional development*. Retrieved from http://www.thutong.doe.gov.za/ResourceDownload.aspx?id=46530.

Schurink, W., Fouché, C. B., & De Vos, A. S. (2011). Qualitative data analysis and interpretation. In A. S. De Vos, H. Strydom, C. B. Fouche, & C. S. L. Delport (Eds.), *Research at the grass roots: For the social sciences and human service professions* (4th ed., pp.397–423). Pretoria, South Africa: Van Schaik Publishers.

Stojiljkovic, S., Djigic, G., & Zlatkovic, B. (2012). Empathy and teachers' roles. *Procedia - Social and Behavioural Sciences, 69*, 960–966.

Swan, P., & Riley, P. (2015). Social connection: Empathy and mentalization for teacher. *Pastoral Care in Education, 33*(4), 1–14.

Thakur, K. (2014). Differentiated instruction in the inclusive classroom. *Research Journal of Educational Sciences, 2*(7), 10–14.

Thomas, L. (2015). *2 Ways being a mom made me a better teacher (and 1 way being a teacher made me a better mom)*. Retrieved from https://www.edutopia.org/discussion/2-ways-being-mom-made-me-better-teacher-and-1-way-being-teacher-made-me-better-mom.

Türkkahraman, M. (2012). The role of education in the societal development. *Journal of Education and Instructional Studies, 2*(4), 38–41.

Weimer, M. (2013). *Defining teaching effectiveness*. Retrieved from http://www. facultyfocus.com/articles/teaching-professor-blog/defining-teaching-effectiveness/.

Zeiger, S. (2016). *The role of a special ed teacher in an inclusive classroom*. Retrieved from http://work.chron.com/role-special-ed-teacher-inclusion-classroom-8734.html.

Factors Influencing Parents' Perceptions on the Education of Children with Disability in the Wa West District of Ghana

Isaac Owusu,

Acheampong Enoch,

(caposterl@yahoo.com)

Wisdom Kwadwo Mprah,

Hashani Vampere,

Centre for Disability and Rehabilitation Studies,

Department of Community Health,

Kwame Nkrumah University of Science and Technology,

Ghana

Abstract

There is heightened concern about the need to provide equal access to education for children

with disability. Children with disability form part of the many disadvantaged groups who are denied access to education. A qualitative approach with descriptive design was used to study the perceptions of parents in the Wa West district of the Upper West Region of Ghana, on the education of their children with disability. Twenty (20) parents of children with disability were purposively selected and interviewed. The data collected were analyzed using thematic analysis. Findings showed that factors such as parents' understanding of disability, cost-benefit issues, awareness/knowledge levels and concerns about safety/security determined parental decisions to send or not to send children with disability to school. The study recommended that there should be comprehensive public education for parents with children with disability as well as opinion leaders in various communities about the potentials of children with disability.

Keywords: *Children with Disability, Perception, Parents, Education, Ghana*

Introduction

According to Munyi (2012), perceptions towards disability have varied significantly from one community to another. The attitudes and reactions towards disabled persons is a clear manifestation of how they are perceived. The history of societal perceptions and treatment of disabled persons shows that ignorance, neglect, superstition and fear are social factors that have exacerbated isolation of disabled persons (Thomas, 1957). Just like other places around the

world, Africans perceive disabled persons as helpless, burdensome and has little hopes (Davidson, 2005). These perceptions were found to be a mere misconception that stems from lack of proper understanding of disabilities and how they affect functioning (Gyamfi,2015). Thes misconceptions could have resulted in the neglect of disabled persons in society compared to their non-disabled counterparts.

Generally, children stand the risk of suffering from social vices and discriminations among others. However, this seems to be worst for children with disability due to the misconceptions surrounding their disabilities. Studies by Donkor, (2010) indicated that, the parental perceptions and expectations for the future of their children with disability strongly influence the resources they are willing to invest in treatment, training and education of these children. Perhaps this makes it common to see children with disability abandoned in African communities and orphanages, denying them basic human rights such as education, probably due to negative perceptions as perpetuated in literature(Larsson,2016).

In the light of these dehumanizing ideologies tagged on children with disability by both parents and the public which results in educational exclusion, the African Child Policy Forum (ACPF, 2014) noted that, the existence of policy frameworks, educational materials, trained educators, could facilitate the provision of quality education for children with disability.

Following this, Section three, clause16 (1) of the Ghana Disability Law made it mandatory for parent, guardian or custodian of a disabled child of school going age to enroll the child in school (Ghana Disability Law, 2006). The Ghana government also introduced the inclusive education policy in order to allow children with disability have access to quality education being offered in the mainstream schools (Thomas, 2014).

In the Wa west district in the upper west region of Ghana, the Ghana Statistical Service (2010) estimated 3% of its population as disabled and 24.5% of them are children of school going age. The statistics further proved that 74% of these disabled persons never attended school. However, only 20.8% of children with disability acquire basic education as against 77.5% of their non-disabled counterparts. However, the district health department does not have the list of all children who may need special interventions. This serves as a barrier for the children to have access to special interventions which may improve their conditions

This trend is no different in other African countries and other countries around the world. Report from the Ministry of Education in Ethiopia indicated that fewer than 3% of children with disabilities have access to primary education. The access to education by this insignificant proportion of children with disability decreases rapidly as they move up the education ladder. Similarly in Nepal, 85% of all children out of school are disabled. In Bolivia it is estimated that 95% of the population aged 6 to 11 years are in school, while only 38% of children with disabilities have gain access to primary education (Global campaign for education, 2017).

The challenge today is changing the negative perceptions attached to disability by stakeholders and even parents which directly results in exclusion of children with disability in schools. The study therefore assessed the perception of parents in the Wa West District on the education of their children with disability and factors influencing these perceptions.

Methods

A qualitative approach and a descriptive design were adopted to explore factors influencing parents' perceptions on the education of their children with disability. A qualitative method is concerned with subjective assessment of attitudes, opinions and reasons for a behavior (Dudwick

et al, 2006). Though it is criticized for time consuming, its strengths of allowing researchers to raise more issues through broad and open-ended enquiry made it helpful for this study.

Purposive and cluster sampling techniques were used to obtain 40 parents as respondents for this study. The parents were divided into clusters based on the towns within the districts where they lived. After randomly selecting the towns, the parents were then selected using purposive sampling. It is used when a researcher chooses specific people within the sample to be used for a particular study (Crossman, 2014). The idea was to concentrate on parents who were in a better position to provide the needed data. Though this sampling technique may be criticized for being bias, Tongco (2007) reported that, the inherent bias of the method contributes to its efficiency.
The study sample was biological parents or caregivers who live with and are taking responsibility for their disabled child's full development and education. For each of the disability groups involved (intellectual, visual, hearing and physical disabilities), five parents were selected from each.

Structured interviewing was adopted in collecting the data from the respondents. Interviews are believed to provide a 'deeper' understanding of social phenomenon than would be obtained from purely quantitative methods, such as questionnaires (Silverman, 2000). With the help of an interview guide, which consisted of several key questions that helped define the areas to be explored, parents were met in their respective homes for the interview. The interview was tape-recorded alongside notes that were taken during the interview. Four research assistants carried out the interview.

The data gathered by taking notes and audio recording were transcribed and analyzed using data-led thematic analysis procedure. The research assistants transcribed the audio recordings and compared them with the notes taken. Their transcriptions were later compared to correct inconsistencies. The transcribed data were then grouped under different themes and were assigned codes. Responses were coded by assigning the same code to the same responses on an issue and different codes on diverging views. The data werea then categorized by grouping extracts with the same code whiles taking note of other codes. Themes were then generated to make meaningful interpretations and to highlight important findings. Some of the quotes from participants have been presented as part of the findings.

Ethical issues

Ethical approval was obtained from committee on Ethics and Human Publication at the Kwame Nkrumah University of Science and Technology. The purpose of the study was explained to participants prior to the commencement of data collection and participation was purely voluntary.
Results

Table 1. Demographic characteristics of participants

Demographics of respondents	Frequency	Percentage (%)
Sex		
Male	22	55
Female	18	45
Total	40	**100**

Age category		
Below 30years	2	5
30 – 50years	22	55
51-70years	12	30
71-90years	4	10
Total	60	**100**
Child's disability		
Intellectual disability	10	25
Physical disability	10	25
Hearing impairment	10	25
Visual impairment	10	25
Total	40	**100**
Educational background		
No formal education	28	70
Junior High School	8	20
Senior High School	4	10
Total	40	**100**

Source: Field Work, 2016

The respondents comprised of eleven (22) male and nine (18) female parents, representing 55% and 45% respectively. The range of respondents was from 28 years to 76 giving an average age 49. 75%of the respondents have never been to school, while 25% attained some level of education with the highest level being a senior high school graduate. Five parents were selected to represent each of the disability groups involved (physical, hearing, visual and intellectual disabilities).

Parents' general understanding of disability

The understanding of disability by parents was found to greatly influence their perceptions, attitudes and treatment of their children with disability. Parents understood disability in different ways and therefore interpreted the capabilities of their children with disability differently.

The study showed that, majority of participants understood disability as sickness and therefore their children could not participate in daily life activities. Others understood that, once someone becomes disabled, he or she becomes unhealthy and his capabilities are lost. ;

"If am with her alone in the house, then am alone because I cannot talk to her. Even though she is here during this our conversation, she will have no impact, so if you are a human being and cannot talk, are you not sick?" (Female participant, individual interview')

"This one what can he do again? The sickness has damaged his whole body." (Female participant, individual interview).

A significant number of respondents also described disabled persons as those born with either deformed body parts, cannot see, hear, or not mentally sound. They explained that the body parts of disabled people are 'not up', either in number, size. However, other parents described the disabled as those possessed by spirit or received the wrath of a deity or God.

"Disabled persons are those cursed by God, and they do not possess human legs" (parent participant, individual interview).

Perceptions of parents on the education of children with disability
Majority of the respondents were optimistic about educating children with disability. However, this depends on the kind of disability of the child. Majority of parents of intellectually children with disability were highly pessimistic about educating their children. They perceived the intellectually disabled child as less human and cannot simply sit in the classroom to learn. Some stressed that, these children cannot be educated by any person not even the parents. The following were their words: *Though she doesn't like fighting, she cannot just go to school. If she behaves like human being then she can go to school, but she doesn't just behave like human being."* (Male participant, individual interview)

"If a parent cannot train his/her own child to be sensible, how can someone else do that? The teacher cannot do it."

However, parents of children with physical, visual and hearing impairment expressed positive perceptions that, their children can be educated in schools. They perceived their children's disability as not suppressing their learning ability.

"Though he cannot walk well, it does not mean the sickness is in the head. If only he goes to school he can learn." (Parent participant, individual interview)

"I know is only the intellectual disabled child that cannot go to school, but all others have been going to school because they are reasonable. There is nothing wrong with my child because he has a brain to learn." (Female participant, individual interview)

Few respondents believed that severe physically children with disability cannot attend school, because such children cannot walk to school, rather they need attention at home due to their vulnerable nature.

Factors influencing parents' perceptions towards the education of children with disability.
The study discovered different levels of positive change in parents' perceptions towards educating their children with disability as compared to previous studies. However, negative perception still exists as some literature indicated. These perceptions, either changing or unchanging were found to be influenced by the following factors;

Economic factors
Parents expressed the need for disabled people to be economically independent as a key factor that drive them to consider educating their children with disability. Majority of respondents indicated that they want their children with disability to be self-reliant in adulthood than to be dependent on people. Some emphasized that if they are educated, children with disability will financially support their parents when they(parents) are old and become vulnerable if they are educated to have jobs. They added that educating children with disability will serve as means of reducing family burden and a source of financial support.

 For instance, a parent whose daughter with hearing impairment learnt decoration at school said;

"My daughter is now working for herself. She is usually called to decorate things at the hospital and other places after which she is paid, so if am not here she can take care of herself. If she had not gone to school who will give her money?" (Female respondent, individual interview).

Another respondent stated:

"If he go to school and get job like some disabled people I know, we will not use money on him again. He will even help us when we call on him."

However, few respondents said the special schools are too far from them and they can't afford always traveling to check on their child.

Awareness/informational accessibility

Majority of respondents saw children with disability as educable after been informed of schools meant for them and the capabilities of disabled persons. Some parents also perceived their children can obtain meaningful education when they became aware of some disabled people who made it in life and helping their families. This is what some parents of children with disability have to say;

"I was at home when some people came to say my child can go to school, so I gave her out to be sent to school. Before then I don't know she can go to school." (Parent participant, individual interview)

"I saw the school where the visually impaired are educated and also heard of the School for the Deaf. I even saw 'blind' people who are teachers and my child can equally do that."

However, all parents of intellectually children with disability expressed ignorance about schools for the intellectually disabled. Most parents stressed that, they have never heard of or see a school where intellectual children with disability are educated. A parent stated;

"How can I think of something am not aware of, I don't know any school for them not to even talk of thinking about their education. I only know the 'deaf', 'blind' and 'cripples' go to schools." (Male respondent, individual interview)

Child monitoring
A good number of respondents especially those who perceived disability as sickness expressed the need to monitor the health of their children with disability (particularly the intellectually disabled) at home. Parents said their children are exposed to danger walking to and fro school and even on the school premises. A parent reported that his intellectual disabled child with epilepsy can fall at risky place and die if there is no one to help. They said it is punishment to send such a child to school. Few parents also added that there is nobody to take care of their children in school especially those that cannot clean up themselves. A respondent said this about his child;

"She is also epileptic and when it occurs she cannot do anything, so assuming it occurred on her way to school when there is no one, she will die. It is worse in the raining season where there is water everywhere. So, it is safe for her when she is in the house." (Parent participant, individual interview)

Attitude of Teachers and children with disability

Majority of respondents described intellectually children with disability as difficult to control and will not stay in school when sent. Others described them as "not having human behavior" and will harm other students. Others perceive their children as not sensible to follow instructions and cannot perform well in school.

"My child even threatens to stone me when am against his will, how more of other students." (Female respondent, individual interview)

"If the mother even send her she won't go, and how can this do what the teacher ask her to do?"(Male respondent, individual interview)

Some parents also revealed that, not all teachers are willing to have intellectual children with disability in their schools. They said some teachers do not have the patience to tolerate their behavior and may sack them.

Discussion

Parents understanding of disability
In this study, majority of participants perceived disabled persons as sick and cannot do things 'normally' or participate in daily life activities. They understood that, once someone becomes disabled, he or she becomes unhealthy and his capabilities are lost. The participants also described disabled persons as those born with either deformed body parts, cannot see, hear, or not mentally sound. They explained that the body parts of disabled people are not up, either in number, size or cannot perform the function it supposed to do accurately. Different ideas and perspectives of parents accounted for different ways of understanding disability. The assertion by Lee & Yuen (2003) that disability is given by God to families or a spiritual punishment for acts performed was confirmed as respondents see intellectual disability as a curse and punishment onto individuals. The strange behavior of some intellectual children with disability, their mannerisms, and interaction in society had possibly made people to see them as less human and controlled by spiritual forces. These children therefore stand the greatest risk of being excluded in many life endeavors such as education.

The findings can be seen as a deviation from the ideal way of understanding disability as proposed by the social advocates (what does the social model of disability say?). This deviation can be attributed to low awareness creation/disability education by Disabled Persons Organizations (DPOs) and the government through relevant authority such as the Social Welfare Department and the National Commission for Civic Education (NCCE).

The understanding of disability by most parents revealed a close consistency with the general historical understanding of disability. Labeling children with disability as sick people and therefore cannot do things 'normal' by their own parents called for medical attention, which is perpetuated by the medical model of disability. As parents hold onto this ideology, they resort to medical care as the first intervention to mitigate the impact of their child's disability. This could imply that, other social measures intended to mitigate the plight of children with disability at adulthood such as education will be seen as irrelevant. Viewing disability from this perspective only means that children with disability are likely to attend school late because education will be a last resort. However, the parents understanding of disability as sickness which focused on medical care could actually lead to an almost effective care that made it easier for their children with disability to function, just as Wasserman et al. (2015) indicated that, this will devise an effective way of caring for the life of children with disability.

Perceptions of parents on the education of children with disability
The study found that parents see the need of enrolling their children with disability in schools without necessarily understanding disability properly. The findings that disabled persons are sick, unhealthy, lost capabilities, not mentally sound and possessed by evil appeared somewhat inconsistent to Moa (2007) assertion that, parents' understanding of disability translates into the perceptions they hold about educating their children. The possible reason for this inconsistency

may be that, effort is being made to educate all children by the education ministry through public education and policies. Despite the fact that disability is not well understood by most parents, majority of them expressed their willingness to educate their children with disability. They do not see their children's disability overruling their learning abilities. However, this positive thought is limited to parents of physical, visual and children with hearing impairment.

Most parents of intellectually children with disability remained that there are no possibilities of educating their children, simply because they are seen as less human and cannot simply sit in the classroom to learn. These parents believed their children's disabilities has taken control over their learning abilities and therefore cannot be educated by any person not even the parent.

These varying perceptions found indicated similarity of findings to the assertion by Munyi (2012) that perceptions towards disability vary from one person to the other. Contrarily to most literature that reported parents' negative perceptions towards educating their children with disability in general (ACPF, 2011), the findings of this study demonstrated a significant shift from negative perceptions to embrace the idea of educating the physical, hearing and visually children with disability for diversified reasons. These positive perceptions endorsed the assertion by Munyi (2012) that, perceptions towards educating children with disability and adults have changed significantly in the field of education.

This could be as a result of the increased awareness on national and international legislation and policy frameworks which seek to change perceptions and attitudes towards disabled persons in all facets of life. For instance, the Ghana Disability Law, which specifically stated in clause three, section 16, subsection 1 that a parent, guardian or custodian of a child with disability of school going age shall enroll the child in school (Ghana Disability Law, 2006).

Notwithstanding this, few parents still perceived children with disability as uneducable for reasons of inaccessible mainstream educational structure. This thought portrayed ignorance about special schools meant for children with disability. For this reason, Banga (2016) noted that, the greatest challenge in education today is ensuring that all schools are as readily and fully accessible to disabled persons as to the non-disabled.

In this study, however, the negative perception about disabled child's education still hold for the intellectually disabled. The relegation of intellectual children with disability to non-human characters and their strange behavior as well as multiple health conditions related to intellectual disability as indicated by parents could probably contribute to this unchanging perception. This was compounded by the fact that parents were ignorant about special schools for the intellectual children with disability hence perceived them as not educable. Intellectual children with disability will continue to be excluded from school if this trend is not immediately corrected.

Factors influencing parents perceptions towards the education of children with disability
Elkins, Kraayenoord and Jobling (2003) reported that the examination of parents' perceptions on their disabled child's education is neither homogeneous nor static. Among the different factors include;

The recognition of the need for children with disability to be economically independent and serve as a security for parents at old age accounted for a positive change in perception towards educating children with disability. These findings could mean that parents have realized the role of education in the economic transformation of individuals especially the disabled and their families. The chronic dependency of disabled persons on their families without economic contribution is perhaps becoming unbearable in many families due to the increasing standard of

living, hence the need for getting everyone to become economically active. In early studies by Heckman (2007) he equally noted a return to educational investments due to families' ambition to increase the overall well-being and secured future for all members. This paradigm shift has an important implication for children with disability since they will attain better education and probably become more economically empowered. It can therefore be stated that the kind of investment made by parents towards their disabled wards' educations was dependent on what parents expect from the child. This is consistent to Donkor, (2010) indication that, the parental expectations for the future of their children with disability strongly influence the resources they are willing to invest in training and education of those children.

 Another issue worth mentioning especially from the perspective of parents who perceived disability as sickness, is the need to monitor the health of their children with disability (particularly those with intellectual disability) at home. They held the view that their children with disability are exposed to danger walking to and from school and even on the school premises. These reasons can be linked to the understanding of disability as sickness by most parents. The health and safety needs of children with disability remain the priority of parents and nothing else because of their vulnerability, and therefore the reason to monitor them in homes. Parents probably described mainstream schools as risky because they see no special care or treatment for children with disability and to avoid these risks simply implies keeping children with disability indoors. This finding, according Wasserman et al (2015) is important because it has devised an effective way of caring for the life of children with disability.

The assertion by Ramirez, Peek-Asa and Kraus (2004) that parents perceived their children with disability, particularly those with severe physical or sensory impairments as vulnerable to accidents and injuries still holds true because even. Schools are seen to be unsafe, a dead trap and as a result, a punishment to send these children to school.

This overprotection has a negative implication for children with disability's educational attainment as well as national development in that, poverty will still prevail among disabled persons as they may not be gainfully employed without education.

Again, children with disability are perceived as educable by their parents after been informed of the existence of schools meant for children with disability and the capabilities of disabled persons when given education. Some parents also perceived that, their children with disability can obtain meaningful education when they became aware of some disabled people who made it in life and helping their families due to education.

It can be inferred from the above finding that, the exclusion of children with disability from schools do not have its cause entirely rooted in negative perceptions of parents but also due to lack of knowledge or information. It can therefore be said that, it was for this lack of knowledge in special schools and the capabilities of children with disability that made most children with disability to be 'perishing' for long time without education. The finding is crucial in re-strategizing policies to embrace the establishment of special schools in most communities

These findings therefore debunked report by the African Child Policy Forum (ACPF, 2014) that Parents' negative perceptions are sorely responsible for parents keeping their children with disability in homes and denying them education. As revealed, keeping children with disability in homes and denying them education does not simply connote that parents have negative perceptions about their children with disability's education, but largely because parents are

unaware of special schools where they can be educated. This assertion by the ACPF may drive away the attention of government and stakeholders in establishing special schools to educate the children with disability, even though the presence of special schools was found to be contributing to change in negative perceptions.

Conclusion

Parents' perceptions have a significant impact on their disabled child's education. Parents showed mixed (positive or negative) perceptions about their children with disability's education. These perceptions emanated from how disability is understood, as well as the disability type and its severity.

Generally, Parents are increasingly becoming aware of the educational benefits for children with disability and are gradually adhering to this by changing their perceptions positively. The major area of reservation pertains to educating the intellectually children with disability as the study discovered no clues of changing in negative perceptions already held about them.

Recommendations

- **Public awareness on understanding about children with disability's education**

The government through the appropriate ministry in collaboration with Disabled People's Organizations (DPOs) and advocates should undertake advocacy at all levels to highlight the urgent need to include children with disability in schools. This should be done by utilizing diverse communication channels such as mass and community media and more importantly the traditional media which includes poetry, storytelling, drama and interpersonal communication. This has the potential of changing the perceptions of the general public and more importantly parents of children with disability on the education of the disabled child. Stigma and prejudice attached to children with disability and sometimes their families are likely to be eliminated and promote positive attitude in the community and at school.

- **Training of teachers on special education**

Teachers in the regular schools must be trained in special education to equip them with the knowledge and skills they require to teach children with disability. This is becausethe trend universally is not in favour of building special schools, but including these children in the regular public school system in order to promote co-existence. To achieve this, it is important for the government to provide training for teachers in regular public schools

- **Inclusion of children with disability in mainstream policies, systems and services**

Stakeholders and policy makers should make provisions for children with disability in formulating policies that has to do with education to support and maximize their development potentials. This should include different ways of assessment and promotion. Giving necessary attention and promoting children with disability's games at basic schools and ensuring an accessible school system in terms of mode of teaching and the environment are likely to make parents perceive their children as educable upon seeing provisions made specifically for their children with disability. Parents are also more likely to change their perceptions if they witness children with disability in various schools engaged in games.

- **Involvement of parents with positive perceptions**

Efforts should be made by stakeholders to identify parents of children with disability who have positive perceptions and has enrolled their children in school to advocate for a change in perception. It is established that, people within the same community or situation are best in understanding the problem on the ground. Parents with negative perceptions are more likely to adhere to people who share similar concerns, and at the same time those with positive perceptions will know much better how to address their concerns. DPOs can financially support these individuals to organize focus group discussions at community levels or a house to house visit for interpersonal discussions.

- **Opinion leaders training**

The government through its ministries should endeavour to provide education and training for relevant opinion leaders such as teachers, chiefs and assembly members on disability. The training may cover the rights of children with disability, the need for both mainstream and targeted services like education, and strategies for the inclusion of children with disability. These people will function as community-based educators on disability issues, who will regularly organize meetings or take opportunity of community meetings to brief parents and community members on the need of disabled child's education.

- **Promoting inclusive education**

The government through the Ministry of Education should promote inclusive education in the district as a way of informing parents of the government's commitment to educating children with disability. Promoting inclusive education will have a positive impact on parents' perceptions about educating their children with disability. The impact will be much greater when the school start achieving results in terms of transforming lives of disabled children.

References:

African Child Policy Forum. *Educating Children with Disabilities in Africa: Towards a policy of Inclusion.* Addis Ababa, the African Child Policy Forum 2011.

African Child Policy Forum. *Access Denied: Voices of persons with disabilities from Africa*. Addis Ababa, New York 2014

Donkor AK. Parents involvement in education in Ghana: The case of a private elementary school University of Kentucky, USA 2010.

Ashley C. *Purposive Samples 2014* [Online] Available at: http://aea365.org/blog/ [Accessed 15th February, 2016].

Chomba WM. *Past and Present Perceptions Towards Disability: A Historical   Perspective;* Kenyatta University, Ohia State; 2012

Dudwick N, Kuehnast K, Jones VN, and Woolcock M. *Analyzing Social Capital in Context: A Guide to Using Qualitative Methods and Data*. 20106; Washington, World Bank Institute.

Gyamfi EA. "Negative attitudes towards persons with disabilities".2015 [Online] Available at: http.www.graphic.com.gh>opinion. [Accessed 3rd March, 2017].

Ghana Disability Law 2006.Accra, Assembly press.

Global Campaign for education; Equal Right, Equal Opportunity: Disability and Education.2017 [Online] Available from http:www.campaignforeducation.org. [Accessed 20th March, 2017].

Heckman JJ. The Economics, Technology and Neuroscience of Human Capability Formation. *Proceedings of the National Academy of Sciences 2007* 104(33), 13-53.

Elkins J, Christiana E, Van K, and Jobling A. Parents' attitudes to inclusion of their children with special needs; *Journal of research in special education needs*; University of Queensland. Australia. 2003 3(2).

Ramirez M, Peek-Asia C, and Kraus JF. Disability and risk of school related injury. *BMJ journal*; 2014 10(1).

Tongco MC. *Ethnobotany Research and Applications; Purposive Sampling as a Tool for Informant Selection*. Quezon City, University of the Philippines, 2007.

Larsson N. Out of sight: the orphanages where disabled children are abandoned 2016 [Online] Available at: http:www.theguardian.com. [Accessed 5th March, 2017].

Banga P. Make schools, colleges accessible for students with disability 2016. [Online] Available at: http.www.globalaccessibilitynews.com. [Accessed 9th March, 2017].

Silverman D. *Doing Qualitative Work.* Sage Publication; London. 2016.

Taneisha D. Joblessness, a major handicap to disabled persons 2005 [Online] Available at: http.www.jamaicaobserver.com. [Accessed 3rd March, 2017].

Otaah TP. *Ghana Begins Inclusive Education in 2015*. *2014*[Online] Available at: http://newsghana.com.gh>news [Accessed 28th January, 2016].

Thomas C. Disability theory: Key ideas, issues and thinkers.' In: Barnes,C., Oliver,M. and Barton, L. (eds.), *Disability studies today.* Malden, MA: Blackwell, 2002 pp.38-57.

Xiong M. Hmong parents' attitudes, perceptions of disability and expectations of children with disabilities: A qualitative study of its impact on academic performance. University of Wisconsin-Stout, Menomonie, WI 2007

Applicability of Standardized Physical Fitness Tests in Children with Different Types of Disabilities

Yasar Tatar,

Physical Medicine and Rehabilitation Department and Faculty of Sports Science, School of Medicine,

Marmara University,

Anadoluhisari Campus,

Turkey

(ytatar@marmara.edu.tr)

Abstract

Adapted fitness tests and tests for children without disabilities are used for evaluating the effects of physical training programs of children with disabilities. This study investigated the applicability of those frequently-used tests for children with different types of disability. A total of 282 children ages between 5 and 14 years with Cerebral Palsy, Spina Bifida, Brachlial Plexus Injury, Spinal Cord Injuries, Amputations, Neuromuscular Diseases, Traumatic Brain Injury, Orthopedic Deformity, Intellectual Disability, Down Syndrome were participated in the study. Gross Motor Function Measure, Modified Ashworth Scale, Posture Analysis, Berg Balance Scale, Sitting Balance, 9 Holed Peg, Sit and Reach, Pro-agility, Anticipation Time, Curl-up, Modified Curl-up, Lateral step-up, Hand grip, Medicine Ball Throw, Pull up and 6 Minute Walk tests were used for evaluation. The major result of this study is that the differences in physical fitness levels, functionality and severity of sequelae rule out using several tests commonly even if the type of disability is the same.

Keywords: *assessment, evaluation, disability, adapted*

Introduction

Evaluating the effects of physical education programs with objective tests are necessary for monitoring the results, providing substantial information for families, creating cooperation with the physical therapy specialist and setting long-term goals (Tripp & Zhu, 2005). Testing perception, talent and movement skills for directing the children with disabilities to sports and consequently screening their physical and psychological conditions will enhance the success of rehabilitation.

Tests applicable on healthy peers are frequently used for the evaluation of children with disabilities. In addition, spesific tests designed particularly for the people with disabilities are also used (Russell *et al.*, 1989; Bae, Waters & Zurakowski, 2008; Brashear *et al.*, 2002). However, using the tests for healthy children on those with disabilities may lead to significant problems of application, programming and evaluation/monitoring (Baumgartner & Horvat, 1988). These problems were partially minimized through modification of the tests (Menear, Sims &Phillips, 2007); nonetheless different types of disabilities were considered in the same group, and the heterogeneity of the group as the participants' mental and physical characteristics had not been taken into account (Baumgartner & Horvat, 1988; Menear, Sims & Phillips, 2007). There are a limited number of studies which report the applicability of those tests on children with different types of disability (Winnick & Short, 2014).

Physical fitness tests for disabilities were preliminarily used by Johnson and Londeree (1976) for mental disabilities. Test of Gross Motor Development-3 (TGMD-3) (Winnick, 2010, Wiar & Darrah, 2001), Brockport Physical Fitness Test (BPFT) (Winnick & Short, 2014) and Brunininks Oseretsky Test of Motor Proficiency (BOTMP) (Wiar & Darrah, 2001) are frequently used test bateries to evaluate the effects of exercise programs in people with disabilities. TGMD-3 intends to evaluate gross motor skills (locomotor and object control) of younger children who are healthy or need special education (Winnick, 2010). BOTMP enables measuring both gross and fine motor skills. It can also be used for children with learning disabilities in addition to healthy peers and it is applicable for older children (Wiar & Darrah, 2001). Brockport Physical Fitness Test (BPFT), adapted from a test battery applicable for healthy children, enables distinctive evaluation of children with different types of disability. BPFT comprises 27 items which evaluate aerobic functioning, body composition and musculoskeletal functioning. It is designed for young people between 10 and 17 years of age with mental disabilities and mild physical disabilities. BPFT is recommended for young people with spinal cord injuries, cerebral palsy, blindness and congenital anomalies or amputations. These types of disabilities were elaborately examined and the tests were reported to be applicable for also other types of disabilities (Winnick & Short, 2014).

People with physical disabilities who have limited mobility, low concentration skills, cannot spend their energies economically and have poor coordination must be monitored with easily applicable functional tests. Monitoring children with objective tests helps to identify the physical capacities of children with disabilities and to design individual exercise programs for them. This evaluation also acceleratesthe development of motor skills, helps to direct them to

proper sports programs and ensures the continuity of exercising. This study investigated the applicability of standardized tests for healthy children and adapted fitness tests for the people with different types of disabilities.

Methods

Participants

A total of 282 children with disabilities ages between 5 and 14 years were participated in the study. Children with;Cerebral Palsy, Spina Bifida, Brachlial Plexus Injury, Spinal Cord Injuries, Amputations, Neuromuscular Diseases, Traumatic Brain Injury, Orthopedic Deformity, Intellectual Disability, Down Syndrome were included. As a prerequisite for admission to the program, the individuals with disabilities were asked to obtain a disability report issued by a healthcare organization.

Materials and Procedure

The initial evaluation was performed by the physician and the physiotherapist. Children who has ability to follow verbal instructions, have not a severe physical disability (severe spasticity/contracture, loss of balance while sitting) which prevents sports participation were admitted. Children who had a seizure in the last six months were not admitted. The participants were divided into groups according to the types of their disabilities (Table 1). Demographic features of the admitted 151 boys and 131 girls according to the types of their disabilities are shown in Table 2.

Children who found eligible after the inspections, were attended to functional tests which evaluate strength, balance, flexibility, agility and coordination. These tests were applied by sports scientists. The tests were applied in the beginning and repeated after 3 months.For adjudging the applicability of the tests, children's status of completion of the tests were examined. Any tests which could not be completed during the initial inspection but were achieved after 3 months were considered applicable. The reasons of failure to perform the tests (physical limitation or mental/psychological maladaptation) were recorded.

The study was conducted according to the Helsinki Declaration, and approved by the local ethics committee. The objective and procedures of the study were explained verbally and by text to each participant. The document for informed consent was signed by the parents of the participants prior to study.

Tests applied to children with different types of disability:

9-Holed Peg Test

This test assesses the fine motor skills (Smith and Hong, 2000). It was implemented on both hands separately to assess the affected and non-affected extremities of the children with disabilities.

Sit and Reach Test

This test evaluates the flexibility of the lumbar extensor and leg flexor muscles (Winnick, 1999). It was applied in two different ways: Two-legs and one-leg (right and left separately).

Pro-Agility Test

This test assesses the agility. In this test, 3 cones with 5 meters distance in-between are placed along a track of 10 meters. The participant stands against the cone in the middle; he/she first touches the cone on the left and then the cone on the right, and finally, returns to the cone in the middle quickly and the completion time is recorded (Faigenbaum *et al.* 2006).

Table 1: The Distribution of the Participants According to the Types of Disabilities

Disability Types	Applied Children		Admitted Children		Nonadmitted Children	
	n	%	n	%	n	%
General	462	100	282	61	180	39
Cerebral Palsy	248	53,7	162	65	86	35
Intellectual Disability	64	13,9	29	45	35	55
Spina Bifida	30	6,5	22	73	8	27
Down Syndrome	23	5	11	48	12	52
Neuromuscular Diseases	21	4,5	15	71	6	29
Brachial Plexus Injury	15	3,2	14	93	1	7
Orthopedic Deformity	9	1,9	8	89	1	11
Traumatic Brain Injury	9	1,9	7	78	2	22
Pervasive Developmental Disorder	9	1,9	3	33	6	67
Epilepsy	6	1,3			6	100
Idiopathic Scoliosis	5	1	5	100		
Metabolic Diseases	4	0,9			4	100
Achondroplasia	2	0,4	2	100		
Visually Impaired	2	0,4	1	50	1	50
Spinal Cord Injury	2	0,4	1	50	1	50
Hearing Impaired	1	0,2	1	100		
Chronic Illness	1	0,2	1	100		
Others	11	2,4			11	100

Table 2: Demographic Features of the Admitted Children According to the Types of Disabilities

Disability Types	Admitted Children	Gender		Age		Height		Weight	
	n	Boy	Girl	M	SD	M	SD	M	SD
General	282	151	131	8,4	3,4	122,7	18,3	25,9	10,1
Cerebral Palsy	162	91	71	8,4	3,3	123,0	18,8	25,3	9,9
Intellectual Disability	29	14	15	8,8	4,6	127,3	15,0	27,6	10,2
Spina Bifida	22	9	13	6,7	2,1	112,7	14,3	23,9	8,8
Down Syndrome	11	10	1	7,8	2,5	117,1	14,3	25,1	11,7
Neuromuscular Diseases	15	8	7	8,0	3,0	114,6	20,2	23,4	11,0
Brachial Plexus Injury	14	8	6	7,6	2,4	122,3	18,8	28,6	8,1
Orthopedic Deformity	8	3	5	9,1	2,6	130,8	13,5	32,5	15,2

Traumatic Brain Injury	7	2	5	11,9	4,3	138,7	16,7	32,6	8,2
Pervasive Developmental Disorder	3	2	1	6,3	1,5	122,0	8,9	21,7	5,5
Idiopathic Scoliosis	5	1	4	9,8	3,8	126,6	23,0	26,2	7,4
Achondroplasia	2		2	13		110		25,0	1,4
Visually Impaired	1	1		16		149		48	
Spinal Cord Injury	1		1	9					
Hearing Impaired	1	1		16		157		52	
Chronic Illness	1	1		6		105		17,7	

Anticipation Time Test

This test assesses the hand-eye coordination and was applied with the Bassin Anticipation Timer (Lafayette Instrument Co., Model 50575) (Ramella, 1984).

6-Minute Walk Test

This test assesses endurance. Walking distance, in 6 minute with controlled sprints was recorded, and used for sub-maximum endurance evaluation (Crapo *et al.*, 2002).

Gross Motor Function Measure-88

Gross Motor Function Measure-88 (GMFM-88) evaluates the gross motor functions of children with cerebral palsy (Russell *et al.*, 1994).

Modified Ashworth Scale

Modified Ashworth Scale (MAS) evaluates spasticity (Bohannon &Smith, 1987).

Posture Analysis

Posture alignment changes were assessed using the New York Posture Rating Chart. The participant is assessed in posterior and lateral directions while standing and looking at a constant point marked at his/her eye level (Hennessey &Watson,1993).

Strength Tests

Curl-Up Test

This test evaluates abdominal muscle endurance and strength. The participants were asked to do curl-ups until they were exhausted, and the time-number data of curls were recorded (Short & Winnick, 2005). Modified curl-up test (curl up while holding hands) was used in children who failed to curl up without supports.

Lateral Step-Up Test

This test assesses functional strength and endurance of the lower extremity. The number of steps that a participant goes up and down in 30 s. was recorded (Blundell, Shepherd, Dean, Adams & Cahill, 2003).

Hand Grip Test

This test assesses hand grip strength. JAMAR Hydraulic-digital hand dynamometer which measures forces higher than 5 kg was used for children without upper extremity disability. It was not possible to use the standard hand grip devices to assess children with upper extremity weaknesses. A dynamometer which can measure very low changes of forces and which can easily be placed in the palm was required. A special dynamometer (precise up to 1 millibar) (Figure 1) was developed by Dr. Yaşar Tatar specifically for this program, calibrated and used.
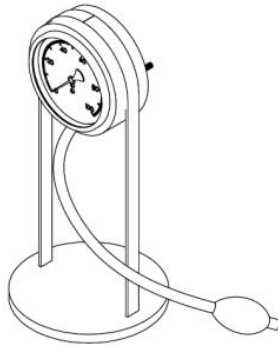
Figure 1: Hand grip strength measuring device

Medicine Ball Throw Test

This test evaluates upper extremity muscle strength. The child was asked to throw a ball with a weight of 2 kg over his/her shoulder 3 times, and the furthest distance was recorded (Michael, McManus & Masters, 2005). The participants were seated during this test as the test intended to measure the upper extremity strength.

Pull-Up Test

This test evaluates isometric strength and endurance of the upper extremity muscles. Exhaustion time of children was recorded while the children lie on their back, pull up the bar and hold at 2,5 to 5 cm distance to their chin (Short & Winnick, 2005).

Balance Tests

Berg Balance Test

This test evaluates the functional balance. Berg Balance Scale consists of 14 items. It evaluates various parameters such as sitting, standing and one-leg standing (Gan, Tung, Tang & Wang, 2008).

Sitting Balance

Seated Postural Control Measure evaluates sitting balance. Pelvis, trunk and head positions were assessed in anterior and lateral directions (Fife *et al.*, 1991).

Static Balance Test

This test assesses static posture control. The centre of pressure parameters while standing on one and/or two legs was examined (Uzun, 2013). The data obtained with the balance platform (Tekscan- Matscan, Boston, USA) and are also used for foot plantar pressure analysis of children with disabilities.

***There may be differences in the number of evaluated individuals and participants of the program as some of the children included in the program could not participate in the measurements taken on different test days.

Data Analysis

Datas were reported as mean ± standard deviation (SD). Percent success rates of children with different types of disability were used for analysis.

Results

More than 50% of children with cerebral palsy completed all tests except the curl-up test (Table 3). Over 70% of the children with intellectual disability completed sit and reach, pro-agility, medicine ball throw, pull up and posture analysis tests. The ratio of completing other tests was in the range of 41-57% (Table 4). More than 50% of children with spina bifida completed the pro-agility, 6 min walk, static balance, lateral step up and posture analysis tests which require ambulation as well as all other tests than the curl-up test (Table 5). Over 67% of children with brachial plexus injury completed all evaluation tests (Table 6). Less than 50% of the children with Down-syndrome completed the tests except the medicine ball throw test and pro-agility test (Table 7).Less than 50% of children with a neuromuscular disease completed the pro-agility, 6 min walk, posture analysis, curl-up, lateral step-up test, hand grip, sitting balance and static balance tests (Table 8).More than 70% of children with traumatic brain injury completed all tests except the left hand 9-holed peg test (Table 9). Children with orthopedic problems (other than amputation, mostly various lower extremity problems) could understand and successfully complete all tests (Table 10).

*The statistical analysis of groups with idiopathic scoliosis, achondroplasia, chronic illness, visually impaired, hearing impaired, spinal cord injury and pervasive developmental disorder could not be reflected due to the low number of participants in these groups.

Table 3. Applicability of Physical Fitness Tests in Children with Cerebral Palsy

| | Application | Completion | | Failure | | Reason of Failure | | | |
| | | | | | | Physical Limitation | | Mental/Psychological Maladaptation | |
	n	n	%	n	%	n	%	n	%
Right-9Holed Peg Test	148	95	64	53	36	32	60	21	40
Left-9 Holed Peg Test	148	105	71	43	29	24	56	19	44
Sit and Reach Test	157	129	82	28	18	18	64	10	36
Pro-Agility Test	150	93	62	57	38	41	72	16	28
Anticipation Test	139	100	72	39	28	5	13	34	87
6 min Walk Test	160	97	61	63	39	43	68	20	32
GMFM	130	103	79	27	21			27	100
MAS	141	126	89	15	11	2	13	13	87
Postur Analyse	151	103	68	48	32	31	65	17	35
Curl Up Test	157	65	41	92	59	76	83	16	17
Modified Curl Up Test	92	84	91	8	9			8	100
Right-Lateral Step Up Test	160	108	68	52	32	38	73	14	27
Left-Lateral Step Up Test	160	108	68	52	32	38	73	14	27
Right-Hand Grip Test	135	89	66	46	34	15	33	31	67
Left-Hand Grip Test	135	88	65	47	35	15	32	32	68
Medicine Ball Throw Test	150	127	85	23	15	11	48	12	52
Pull Up Test	151	134	89	17	11	4	24	13	76
Berg Balance Test	146	121	83	25	17	10	40	15	60
Sitting Balance	126	90	71	36	29	14	39	22	61
Static Balance Test	139	74	53	65	47	45	69	20	31

Table 4: Applicability of Physical Fitness Tests in Children with Intellectual Disability (ID)

| | Application | Completion | | Failure | | Reason of Failure | | | |
| | | | | | | Physical Limitation | | Mental/Psychological Maladaptation | |
	n	n	%	n	%	n	%	N	%
Right-9 Holed Peg Test	28	15	54	13	46			13	100
Left-9 Holed Peg Test	28	15	54	13	46			13	100
Sit and Reach Test	28	20	71	8	29			8	100
Pro-Agility Test	28	22	79	6	21			6	100
Anticipation Test	27	11	41	16	59			16	100
6 min Walk Test	28	15	54	13	46			13	100
Postur Analyse	29	22	76	7	24			7	100
Curl Up Test	28	14	50	14	50	6	43	8	57
Modified Curl Up Test	14	8	57	6	43			6	100
Right-Lateral Step Up Test	28	16	57	12	43			12	100
Left-Lateral Step Up Test	28	16	57	12	43			12	100
Right-Hand Grip Test	28	15	54	13	46			13	100
Left-Hand Grip Test	28	15	54	13	46			13	100
Medicine Ball Throw Test	28	22	79	6	21			6	100
Pull Up Test	28	20	71	8	29			8	100
Berg Balance Test	29	14	48	15	52			15	100
Sitting Balance	24	10	42	14	58			14	100
Static Balance Test	28	16	57	12	43			12	100

Table 5: Applicability of Physical Fitness Tests in Children with Spina Bifida (SB)

| | Application | Completion | | Failure | | Reason of Failure | | | |
| | | | | | | Physical Limitation | | Mental/Psychological Maladaptation | |
	n	n	%	n	%	n	%	n	%
Right-9 Holed Peg Test	22	19	86	3	14			3	100
Left-9 Holed Peg Test	22	19	86	3	14			3	100
Sit and Reach Test	22	16	73	6	27	3	50	3	50
Pro-Agility Test	22	10	45	12	55	9	75	3	25
Anticipation Test	22	18	82	4	18			4	100
6 min Walk Test	22	10	45	12	55	9	75	3	25
Postur Analyse	21	9	43	12	57	9	75	3	25
Curl Up Test	22	4	18	18	82	15	83	3	17
Modified Curl Up Test	18	15	83	3	17	1	33	2	67
Right-Lateral Step Up Test	22	10	45	12	55	9	75	3	25
Left-Lateral Step Up Test	22	10	45	12	55	9	75	3	25
Right-Hand Grip Test	22	18	82	4	18			4	100
Left-Hand Grip Test	22	18	82	4	18			4	100
Medicine Ball Throw Test	22	17	77	5	23	3	60	2	40
Pull Up Test	22	19	86	3	14			3	100
Berg Balance Test	20	13	65	7	35	4	57	3	43
Sitting Balance	20	12	60	8	40	6	75	2	25
Static Balance Test	22	11	50	11	50	9	82	2	18

Table 6: Applicability of Physical Fitness Tests in Children with Brachial Plexus Injury (BPI)

		Reason of Failure

	Application	Completion		Failure		Physical Limitation		Mental/Psychological Maladaptation	
	n	n	%	n	%	n	%	n	%
Right-9 Holed Peg Test	11	10	91	1	9	1	100		
Left-9 Holed Peg Test	11	10	91	1	9			1	100
Sit and Reach Test	12	12	100						
Pro-Agility Test	11	11	100						
Anticipation Test	12	10	83	2	17			2	100
6 min Walk Test	11	10	91	1	9			1	100
Postur Analyse	14	14	100						
Curl Up Test	11	8	73	3	27	3	100		
Modified Curl Up Test	3	3	100						
Right-Lateral Step Up Test	12	12	100						
Left-Lateral Step Up Test	12	12	100						
Right-Hand Grip Test	10	8	80	2	20	2	100		
Left-Hand Grip Test	10	9	90	1	10			1	100
Medicine Ball Throw Test	12	12	100						
Pull Up Test	12	11	92	1	8	1	100		
Berg Balance Test	10	8	80	2	20			2	100
Sitting Balance	6	4	67	2	33			2	100
Static Balance Test	9	7	78	2	22			2	100

Table 7: Applicability of Physical Fitness Tests in Children with Down Syndrome (DS)

						Reason of Failure			
	Application	Completion		Failure		Physical Limitation		Mental/Psychological Maladaptation	
	n	n	%	n	%	n	%	n	%
Right-9 Holed Peg Test	11	4	36	7	64			7	100
Left-9 Holed Peg Test	11	4	36	7	64			7	100
Sit and Reach Test	11	5	45	6	55			6	100
Pro-Agility Test	11	6	55	5	45			5	100
Anticipation Test	11	3	27	8	73			8	100
6 min Walk Test	11	3	27	8	73			8	100
Postur Analyse	11	4	36	7	64			7	100
Curl Up Test	11	3	27	8	73			8	100
Modified Curl Up Test	8	2	25	6	75			6	100
Right-Lateral Step Up Test	11	3	27	8	73			8	100
Left-Lateral Step Up Test	11	3	27	8	73			8	100
Right-Hand Grip Test	11	2	18	9	82			9	100
Left-Hand Grip Test	11	2	18	9	82			9	100
Medicine Ball Throw Test	11	7	64	4	36			4	100
Pull Up Test	11	4	36	7	64			7	100
Berg Balance Test	11	1	9	10	91			10	100
Sitting Balance	10	2	20	8	80			8	100
Static Balance Test	11	1	9	10	91			10	100

Table 8: Applicability of Physical Fitness Tests in Children with Neuromuscular Diseases (ND)

| | Application | Completion | | Failure | | Reason of Failure | | | |
| | | | | | | Physical Limitation | | Mental/Psychological Maladaptation | |
	n	n	%	n	%	n	%	n	%
Right-9 Holed Peg Test	14	11	79	3	21	2	67	1	33
Left-9 Holed Peg Test	14	10	71	4	29	2	50	2	50
Sit and Reach Test	14	13	93	1	7	1	100		
Pro-Agility Test	14	6	43	8	57	6	75	2	25
Anticipation Test	13	7	54	6	46	2	33	4	67
6 min Walk Test	14	4	29	10	71	7	70	3	30
Postur Analyse	14	6	43	8	57	5	63	3	37
Curl Up Test	14	2	14	12	86	11	92	1	8
Modified Curl Up Test	12	8	67	4	33	3	75	1	25
Right-Lateral Step Up Test	14	5	36	9	64	7	78	2	22
Left-Lateral Step Up Test	14	5	36	9	64	7	78	2	22
Right-Hand Grip Test	13	5	38	8	62	4	50	4	50
Left-Hand Grip Test	13	5	38	8	62	4	50	4	50
Medicine Ball Throw Test	14	12	86	2	14	1	50	1	50
Pull Up Test	14	11	79	3	21	2	67	1	33
Berg Balance Test	13	11	85	2	15	1	50	1	50
Sitting Balance	11	4	36	7	64	3	43	4	57
Static Balance Test	14	4	29	10	71	7	70	3	30

Table 9: Applicability of Physical Fitness Tests in Children with Traumatic Brain Injury (TBI)

| | Application | Completion | | Failure | | Reason of Failure | | | |
| | | | | | | Physical Limitation | | Mental/Psychological Maladaptation | |
	n	n	%	n	%	n	%	n	%
Right-9 Holed Peg Test	7	7	100						
Left-9 Holed Peg Test	7	3	43	4	57	4	100		
Sit and Reach Test	7	7	100						
Pro-Agility Test	7	7	100						
Anticipation Test	7	7	100						
6 min Walk Test	7	7	100						
Postur Analyse	6	6	100						
Curl Up Test	7	5	71	2	29	2	100		
Modified Curl Up Test	2	2	100						
Right-Lateral Step Up Test	7	7	100						
Left-Lateral Step Up Test	7	7	100						
Right-Hand Grip Test	7	5	71	2	29	2	100		
Left-Hand Grip Test	7	7	100						
Medicine Ball Throw Test	7	6	86	1	14	1	100		
Pull Up Test	7	7	100						
Berg Balance Test	7	7	100						
Sitting Balance	5	5	100						
Static Balance Test	6	6	100						

Table 10: Applicability of Physical Fitness Tests in Children with Orthopedic Deformity (OD)

	Application	Completion		Failure		Physical Limitation		Mental/Psychological Maladaptation	
						Reason of Failure			
	n	n	%	n	%	n	%	n	%
Right-9 Holed Peg Test	8	8	100						
Left-9 Holed Peg Test	8	8	100						
Sit and Reach Test	8	8	100						
Pro-Agility Test	8	8	100						
Anticipation Test	7	7	100						
6 min Walk Test	8	8	100						
Postur Analyse	6	6	100						
Curl Up Test	8	8	100						
Modified Curl Up Test									
Right-Lateral Step Up Test	8	8	100						
Left-Lateral Step Up Test	8	8	100						
Right-Hand Grip Test	8	8	100						
Left-Hand Grip Test	8	8	100						
Medicine Ball Throw Test	8	8	100						
Pull Up Test	8	8	100						
Berg Balance Test	8	8	100						
Sitting Balance	7	7	100						
Static Balance Test	6	6	100						

Discussion

This study was produced from a European Union Project which was planned for social integration of children with disability. In this project evaluating the effects of the training program with objective tests was one of the primary goals. In this study the applicability of frequently used physical fitness tests was investigated. Similar average ages of children with different types of disability eliminated the effects of the age in evaluation. Sex ratio among the general population of the program was 54/46% for male/female. The balanced distribution of sex facilitated generalization of the tests.

Assessing the results with regard to inclusion criterias most of the participants who have not admittedto the study were children with CP's and ID's. This was due to the inclusion criterias (ability to follow verbal instructions, not having any severe physical inability which prevents sports participation). Taking into consideration the emphasis of Baumgartner and Horvat, (1988) the sports scientists in this study were informed and trained on the application of tests in different types of disabilities at the beginning of the study. Multidisciplinary assessments were carried out with physicians, physiotherapists and sports scientists for valid and reliable testing of children with disabilities. Furthermore, sufficient explanations, repetitions and time were given to solve the problems related to not having participated in physical fitness tests before, and not comprehending the tests due to mental incompetence.

It was found that children with CP accounted for the highest percent in participation to this study which children with physical disabilities were included. It may be related to the higher

prevalence of CP in general population. CP incidence in Turkey was reported at around 2-4.4/1000, compared to 2/1000 of the world (Serdaroğlu, Cansu, Özkan, & Tezcan, 2006; Yılmaz Yalçınkaya *et al.*, 2014). CP was reported as the cause of 67% of severe physical disability in childhood (Cans *et al.*, 2004). The high number of CP applications to the study is compatible with those data. A great number of the children with CP, who applied to the study were not included in the program due to not satisfying the main criteria (severe spasticity/contracture, loss of balance while sitting).

In children with CP, the tests were applied with high rates of success. The low percentage of ability to complete the curl-up test is due to the weakness in abdominal muscle strength rather than mental/psychological maladaptation. The high completion ratio of the modified curl-up test also supports our opinion. GMFM-88 could be completed in all participants with CP other than those children with mental/psychological maladaptation. The applicability of this test, which evaluates functional limitations of children during activities of daily living, is important for programming and monitoring physical education for all children. Adaptation problems were observed with only 13 children (maladaptation-crying) during the application of MAS. It was considered to be due to the reactions of children as they associate the application of the test with rehabilitation implementations/exercise. Static balance test of children with CP could not be carried out mostly due to physical limitations. The failure in this test may also be the reason of the failure in pro-agility, 6 min walk, posture analysis and Berg balance tests which may be associated with it. The reason of unaplicabilityof 9-holed peg test in CP is mostly physical incompetence, while the reason of unaplicability in hand grip test is mental/psychological maladaptation. We believe that the difference in the reason of failure between the two tests, which evaluate hand functions, is caused by the impact of time restriction on the application of the test.

In children with ID and DS, only those who could follow verbal instructions and had mild physical disabilities were accepted. In children with both types of disabilities, following Baumgartner and Horvat (1998)'s recommendations, sufficient time and repetitions were given appropriate for the child's specific needs to ensure that the child understands the tests and attunes to the trainer. Despite these precautions, the problems of comprehending the instructions of the tests and participants' adaptation to the tests lowered the success rates of the tests. Meanwhile, the applicability of the tests in the ID group was higher compared to the DS group. Menear *et al.* also reported the difference between ID and DS and suggested modifications for the tests (Menear *et al.*, 2007). Children with ID could complete all tests at a high ratio, except berg balance test and sitting balance test as they required the ability to follow different instructions, and the anticipation time test which is relatively difficult to understand. Nevertheless, it was noted that the completion ratio of the modified curl-up test was not high for children with ID, mainly due to the problem in understanding the test could not be overcome. Failure to complete the curl-up test even after modification was also observed during the evaluation of children with DS. We believe, in accordance with the opinion of Baumgartner and Horvat (1988) that age is another factor for failure to apply a number of tests in these groups. The high success rate of children in both groups in the tests such as pro-agility test and medicine ball throw test indicate

the necessity of adapting the tests from daily life. Furthermore, making modifications such as placing an attractive object towards the point for the child to reach, in order to increase the child's motivation to complete the sit and reach test will increase the applicability of the tests (Menear et al., 2007). The different testing profiles of children with ID and DS in the present study suggest that the method of evaluating children with ID and DS in the same category, which was preferred for Brockport Test Battery (Short & Winnick, 2005) should be reconsidered.

In the developed countries, the SB incidence is 0.1% (Olney & Mulinare, 2002), whereas the rate in Turkey was reported as 0.15-0.4% (Güvenc *et al.*, 1993; Tuncbilek, Boduroğlu & Alikaşifoğlu, 1999). In Gaziantep (Turkey), where the study was conducted, the excessive number of SB despite high consumption of food containing vitamin B (wheat products) indicates the effectiveness of other factors in SB formation. It was noted that children with SB had a low rates of completing the tests that require locomotion such as walking and agility tests and balance/posture, while they completed the tests requires the use of upper extremity at high rates. This suggests that the failure of children with SB to complete the tests was caused by lower extremity/core muscle weakness rather than mental/psychological problems. Application of curl-up without supports was limited while curl-up with supports was completed successfully. Deciding which of those tests would be used by judging the level of injury will be beneficial. It indicates that even if they have the same type of disability, severity of damage and the differences in functional limitations are required to be considered during the selection of tests.

Children with BPI completed all tests in higher rates including upper extremity tests at the involved sides. The fact that the completion rates dropped under 90% in certain tests was related to maladaptation caused by children's ages.

Children with NMD were generally successful in the tests that require the use of upper extremity, but their rates of completing pro-agility test, 6 min walk test, posture analysis, lateral step up test and static balance tests, which required standing for a certain period of time were low. The failure to complete sitting balance, curl up and modified curl up tests is thought to be caused by trunk/core muscle weakness of children. It indicates that the exposure level of the body parts should also be considered together with the type of disability when selecting tests.

Children with TBI and OD generally understood and successfully completed the tests. It was noted that children with OD did not have any physical limitation or mental/psychological maladaptation which might effect completion rates of the applied tests.

Considering the percentages of applicability of the tests within the general assessment;

Peg board test could be completed by all groups except ID and DS with a high percentage. Mental/psychological maladaptations in these groups reduced the applicability of this test. Furthermore, ID group could complete the tests with a higher percentage than DS group. TBI group had a lower success rate in left hand peg board test which was affected. Children with hemiplegic CP could complete the test with high rates despite the problems caused by their physical limitations.

Sit and reach test could be completed by all groups except DS with a high percentage. Variationin the applicability was also found for this test between ID and DS groups. Completion

of the test despite the high number of lower extremity affected children participating in the program, indicates the importance of body and upper extremity support to conduct this test.

The agility test was successfully completed with a high percentage particularly by OD, BPI and ID groups. The problems which effects locomotion of SB and NMD groups reduced the applicability of this test for these groups. Children with DS could complete the test at a very low percentage although they did not have any physical disabilities.

Children with TBI, OD, CP, SB and BPI could complete the reaction time test with a high percentage. Completion percentages of both ID and DS groups were low, while ID group had a higher completion percentage than DS.

Children with TBI, OD and BPI could complete the Six Minute Walk Test with a high percentage. Children with NMD did not have the required physical capability to complete the test. The applicability of the test was also low for SB and CP groups due to the limitations of lower extremity motor functions. Although the ideas suggesting that reducing the time and distance or conducting the test with healthy peers could increase the completion rate (Menear, Sims, & Phillips, 2007) were taken into account,   DS and ID groups had a low percentage of completing the tests.

For posture analysis, children are required to stand at a predetermined position for a period of time. This test cannot be used for children who cannot stand up. Successful completion rates of the tests was low due to the problem of standing stil without changing position in ID and DS groups.

Curl-up test could be completed with a high percentage by OD, TBI and BPI groups. Physical limitations of SB and NMD groups reduced the completion percentage of the test, while the test had higher success rates when it was applied with supports (modified curl up test). ID group had higher completion percentages than DS group.

Lateral step up test was found applicable for TBI, OD and BPI groups. CP, SB and NMD groups failed to complete the test due to the physical limitations, while ID and DS groups failed due to mental or psychological maladaptation.

Children with BPI had a low rate of success completing the hand grip test particularly with their involved extremity. Children with DS also failed the hand grip test. NMD group had a low percentage of completing the test due to both physical and mental/psychological maladaptations.

Medicine ball throw test could be completed by all groups with a high percentage. It is because the test could easily be understood or it was similar to the activities of daily life. Children with BPI also had a high completion percentage of the test with support from the healthy side of their bodies.

Pull up test could be applied successfully in all groups except DS.

It was found that Berg balance test could be completed at very low rates in the DS group, and it could be completed under 50% by the ID group. It is believed that the problems in understanding the test had a negative impact on applicability rates.

In the sitting balance test, in addition to ID and DS groups, the completion rate of the test was also found low for the NMD group.

The static balance test, which requires standing 30 s. on the force platform was completed with a very low percentage by DS and NMD groups while OD, TBI and BPI groups could completed it with a high percentage. It was completed by around at a rate 50% of the other groups.

This study differs from other studies as it includes the examination of several functional tests on different types of disability. Individual reporting or tests specific for a certain group of disability (modified Ashworth scale etc.) are frequently used in this kind of studies. Although this method is functional for monitoring changes in the same type of disability, tests which can commonly be used for collective evaluation of different types of disability are needed.

In conclusion, there may not be any test-evaluation systems which can be applied for all types of disabilities, even after being modified. Even having the same disability type does not allow using several/all tests commonly. The differences in physical fitness levels, functionality and severity of sequelae rule out using several tests commonly even if the type of disability is the same. Modifications will be required in the application of the tests according to the physical limitations of the affected extremities. "Psychological adaptation problems" experienced during the application of the tests and the "mental incompetence" in understanding and completing the test should be considered in different categories. It should be remembered that tests will be considered applicable if the deficiencies in understanding the test can be corrected with repeated practice.

Recommendations

For physical fitness test applications in children with disabilities, attention should be paid to:
- Obtain a medical evaluation report which includes the movements and functions that should be avoided,
- Obtain a consent form from the children's parents before starting the tests,
- Train the instructors on the applicability of tests for different types of disability,
- Make necessary arrangements to ensure children's safety during the tests,
- Consider that the time required for each child to understand, practice and apply the test may be different,
- Remember that being tested with a group increases motivation of certain children while it may have a negative impact on others,
- Consider that physical and mental problems specific for the disability may require certain modifications in the application of the tests,
- Choose the tests for the evaluation of children with disabilities according to the children's physical performance levels and modify the tests when necessary,
- Know that individual needs of each child may also require special modifications for each test,
- Avoid changing the purpose of the test as a result of the modifications,
- Conduct preliminary and final tests in similar conditions,
- Note the results of the tests on straightforward forms,
- Evaluate the test results with a multidisciplinary approach,

- Generate short, straightforward reports for families and other professionals involved in the child's education and rehabilitation,
- Use follow-up forms to transfer the development of the child to the daily life, and receive help from the family in this regard.
- Conduct the evaluation using the test criteria of Education for All Handicapped Children (Trip & Zhu, 2005).

Compliance with Ethical Standards

Funding

Ethical Approval

All procedures performed in the study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards.

Informed Consent

Informed consent form was obtained from all participants' parents.

Conflict of Interest

The author declares that he has no conflict of interest.

References:

Bae, D. S., Waters, P. M., & Zurakowski, D. (2008). Correlation of pediatric outcomes data collection instrument with measures of active movement in children with brachial plexus birth palsy. *Journal of Pediatric Orthopaedics*, 28(5), 584-592.

Baumgartner, T. A., & Horvat, M. A. (1988). Problems in measuring the physical and motor performance of the handicapped. *Journal of Physical Education, Recreation & Dance,* 59(1), 48–52.

Blundell, S. W., Shepherd, R. B., Dean, C. M., Adams, R. D., & Cahill, B. M. (2003). Functional strength training in cerebral palsy: a pilot study of a group circuit training class for children aged 4–8 years. *Clinical Rehabilitation,* 17(1), 48-57.

Bohannon, R. W., & Smith, M. B. (1987). Interraterreliability of a modifiedAshworthscale of musclespasticity. *Physicaltherapy,* 67(2), 206-207.

Brashear, A., Zafonte, R., Corcoran, M., Galvez-Jimenez, N., Gracies, J. M., Gordon, M. F.,Mcafee A., Ruffing K., Thompson B., Williams M., Lee C.H., &Turkel C. (2002). Inter-and intrarater reliability of the Ashworth Scale and the Disability Assessment Scale in patients with upper-limb poststroke spasticity. *Archives of physical medicine and rehabilitation,* 83(10), 1349-1354.

Cans, C., Surman, G., McManus, V., Coghlan, D., Hensey, O., & Johnson, A. (2004, March). Cerebral palsy registries. *In Seminars in pediatric neurology*, 11 (1), 18-23. WB Saunders.

Crapo, R.O., Casaburi, R., Coates, A.L., Enright, P.L., MacIntyre, N.R., McKay, R.T., &Mottram, C. (2002). ATS statement: guidelinesforthesix-minutewalk test. *AmericanJournal of Respiratoryand Critical CareMedicine,* 166(1), 111.

Faigenbaum, A. D., Kang, J., McFarland, J., Bloom, J. M., Magnatta, J., Ratamess, N. A., &Hoffman, J. R. (2006). Acuteeffects of differentwarm-upprotocols on anaerobicperformance in teenageathletes. *PediatricExerciseScience,* 18(1), 64.

Fife, S. E., Roxborough, L. A., Armstrong, R. W., Harris, S. R., Gregson, J. L., & Field, D. (1991). Development of a clinical measure of postural control for assessment of adaptive seating in children with neuromotor disabilities. *Physical Therapy,* 71(12), 981-993.

Gan, S. M., Tung, L. C., Tang, Y. H., &Wang, C. H. (2008). Psychometricproperties of functionalbalanceassessment in childrenwithcerebralpalsy. *Neurorehabilitation and Neural repair,* 22(6), 745-753.

Güvenc, H., Uslu, M. A., Güvenc, M., Ozekici, U., Kocabay, K., & Bektaş, S. (1993). Changing trend of neural tube defects in eastern Turkey. *Journal of Epidemiology & Community Health,* 47(1), 40-41.

Hennessey, L., & Watson, A. W. (1993). Flexibilityandpostureassessment in relationtohamstringinjury. *British Journal of Sports Medicine,* 27(4), 243-246.

Johnson & Londeree, B. (1976). Motor Fitness Testing Manual for the Moderately Mentally Retarded. Washington, D,C,: *American Alliance for Health, Physical Education, and Recreation,*

Menear, K. S., Sims, S. K., & Phillips, J. (2007). Fitness Testing of Students with Disabilities: Comparing and Modifying Fitness Tests to Provide Quality Assessments for All Students. *Strategies: A Journal for Physical and Sport Educators,*20(3), 12–21.

Michael, A. T., McManus, A. M., & Masters, R. S. (2005). Development and validation of a core endurance intervention program: implications for performance in college-age rowers. *Journal of Strength and Conditioning Research,* 19(3), 547.

Olney, R. S. &Mulinare, J. (2002). Trends in neural tube defect prevalence, folic acid fortification, and vitamin supplement use. *In Seminars in perinatology,* 26 (4), 277-285. WB Saunders.

Ramella, R. J. (1984). Effect of knowledge of results on anticipationtimingbyyoungchildren. *Perceptualand Motor Skills,*59(2), 519-525.

Russell, D. J., Rosenbaum, P. L., Cadman, D. T., Gowland, C., Hardy, S., & Jarvis, S. (1989). The gross motor function measure: a means to evaluate the effects of physical therapy. *Developmental Medicine & Child Neurology,* 31(3), 341-352.

Russell, D. J., Rosenbaum, P. L., Lane, M., Gowland, C., Goldsmith, C. H., Boyce, W. F., &Plews, N. (1994). Training users in theGross Motor FunctionMeasure: methodologicalandpracticalissues. *PhysicalTherapy,* 74(7), 630-636.

Serdaroğlu, A., Cansu, A., Özkan, S., &Tezcan, S. (2006). Prevalence of cerebral palsy in Turkish children between the ages of 2 and 16 years. *Developmental Medicine and Child Neurology,* 48(6), 413-416.

Short, F. X., &Winnick, J. P. (2005). Test itemsandstandardsrelatedtoflexibility/range of motion on theBrockportphysicalfitness test. *AdaptedPhysical Activity Quarterly*, 22(4): 401-417

Smith, Y. A. & Hong, E. (2000). Normativeandvalidationstudies of the Nine-hole Peg Test withchildren.*Perceptualand Motor Skills,* 90(3), 823-843.

Tripp, A. & Zhu, W. (2005). Assessment of students with disabilities in physical education legal perspectives and practices. *Journal of Physical Education, Recreation & Dance,* 76(2), 41-47.

Tuncbilek, E., Boduroğlu, K., & Alikaşifoğlu, M. (1999). Neural tube defects in Turkey: prevalence, distribution and risk factors. *The Turkish Journal of Pediatrics,* 41(3), 299-305.

Uzun, S. (2013). Theeffect of long-termtraining program on balance in childrenwithcerebralpalsy: Results of a pilot studyforindividuallybasedfunctionalexercises. *EducationalResearchandReviews*, 8(11), 747-757.

Wiart, L., & Darrah, J. (2001). Review of four tests of gross motor development. *Developmental Medicine and Child Neurology*, 43(4), 279-285.

Winnick, J. P. (2010). *Adapted Physical Education and Sport 5th Edition.* Human Kinetics.

Winnick, J. P., & Short, F. (2014). *Brockport physical fitness test manual: a health-related assessment for youngsters with disabilities*. Human Kinetics.

Yılmaz Yalçınkaya, E., Hüner, B., Dinçer, Ü., Dıraçoğlu, D., Aydın, R., İçağasıoğlu, A., Demirhan E., Yalçın L., Öneş K., Çağlar N., Yüksel A., Karamehmetoğlu Ş.S., Türkdoğan D, Zorer G., Yapıcı Z., Erhan B., Akyürek B., Kuran B, Akbaş H., Paker N., Uçar D., Öztürk K.,& Özaras N (2014). Demographic And Clinical Findings Of Cerebral Palsy Patients İn Istanbul: A Multicenter Study. *Turkish Journal Of Physical Medicine & Rehabilitation*, 60(2): 134-8.

New Orleans Educational System in Public Schools Pre/Post Hurricane Katrina as Perceived by Special Education Teachers

Sultan Alzahrani,

University of Jeddah, KSA

Abstract

This modified narrative study is an exploration of the perceptions of two special educators who experienced the dramatic changes in the New Orleans public school system as a result of Hurricane Katrina. The participants in this study will consist of two special education professionals (See Table 1). From their perspectives, the reader shall gain a deeper understanding of how the educational system has evolved from its pre-Katrina structure.

Introduction

Prior to 2005, the New Orleans educational system faced major academic, economic, and structural issues (Beabout, 2007; Mirón, 2008). At this time, the parish was substantial in size with over 100 public K-12 schools (Hill & Hannaway, 2006). "The public schools of New Orleans have long been believed to be among the worst of any big city school systems in the United States" (Beabout, 2007, p. 43). In the 2004-2005 school year, not even half of all Orleans Parish fourth graders proved proficient in reading and only about one in four were proficient in math; in addition, three quarters of parish schools received an "academic warning" or were considered "academically unacceptable (Hill & Hannaway, 2006). Due to low performance and the migration of affluent White students into private and catholic schools, the city of New Orleans had one of the highest student attendance rates in private education (Newmark & De Rugy, 2006; Beabout, 2007).

On August 29, 2005 the city of New Orleans was devastated by the remnants of Hurricane Katrina as a result of breached levees. Many of the residents were displaced, downtrodden, and in dire need of resources for daily survival due to immense flooding. Feeling abandoned by their local, state, and federal government agencies

because of lack of support, many citizens were unable to make a swift return to the normalcy they once knew (Wynne, 2007). The impact of Hurricane Katrina compounded already existing inadequacies in Orleans parish schools, which lead to the literal deconstruction of the education system. From this desolation, the district briefly lost its typical students and students with disabilities population because of lack of resources and struggled to reopen schools (Beabout, 2008). In Orleans Parish, only 20 public school buildings were found suitable for occupancy after Hurricane Katrina in comparison to the 120 useable school buildings prior to the storm (Hill & Hannaway, 2006). Therefore, school board members made the conscious decision to terminate teaching positions (Beabout, 2007). State government officials in Louisiana decided that the best way to rebuild schools was through the recovery school system, and through the commissioning of charter schools (Beabout, 2008). As a result, New Orleans Public Schools (NOPS) only retained five public schools (Beabout, 2008).

Table 1. Demographics of Participants

	Teacher 1	Teacher 2
Years of Experience	20	18
Level of Education	Master's Degree+ Ph.D. Students	Bachelor's Degree
Ages	43	39
Gender of Teachers	Female	Female
Specialization	Special Education	Special Education
Current Job Title	Administrator	Special Ed. Teacher

Statement of Purpose

This narrative study will address the academic, economic, social, and structural changes made to the New Orleans Public School System which may affect the general and special education programs as experienced through two special educators in this region. Through their perceptions, I will approach the issues faced by the New Orleans Public Schools prior to Katrina, and how these issues were affected by the disaster. The

impact of Katrina on the school system in both general and special education programs created a phenomenon of change that must be explored.

Significance

The exploration of the lived experiences of special educators who survived physically and professionally the events of Hurricane Katrina is important because it gives a voice to those striving to reconstruct the concept of education. In addition, their perspectives will provide a deeper understanding of how a natural phenomenon altered the structure of a large urban education system. The findings from this study will help the reader understand these educators' perspectives on how traumatic events such as Hurricane Katrina can impact special education programs and K-12 school system in general.

Research Questions

This analysis leads to the following research questions for this study. These questions may evolve based on the data collected.
1) What were the perceptions of special educators in New Orleans public school system pre-Katrina?
2) What were the perceptions of special educators in New Orleans public school system post-Katrina?

Narrative

Both of the participants started their narratives off by stating that they were happy working in New Orleans Public School System before Hurricane Katrina. When discussing their pre-Katrina experience, Mona stated, "We had to get back so my husband could get back to work but I was ready to come home and teach." In a similar vein, Nany recalled, "Before the storm, I worked in New Orleans Public School System for five years as special education teacher and my experiences were okay and the students with disabilities were the first priority," "People used to talk about how flawed the system was before, but I find the system to be more flawed now."

Both educators described the experiences they encountered due to evacuation and the rebuilding of their lives. Mona was able to leave New Orleans before the storm whereas Nany was unprepared for evacuation. Following the storm, Mona was able to immediately return to New Orleans due to her husband's job, while Nany relocated briefly to Texas then to Franklin, Louisiana to live with family. Although both participants returned under different circumstances, they both had a strong desire to return to New Orleans and the classroom. There was a strong connection to the city as well as to the teaching profession that pushed both ladies to defy the odds placed before them. These themes represent their stories.

Shortly after their return, both educators began working for charter schools. As Mona stated, Charter schools have changed the face of the educational landscape of New Orleans. Whether it was the culture, the collaboration, or the financial fidelity, she believed that the influx of charter schools created a deep atmosphere of change.

One of the most obvious changes in the months following the storm was the change to school names. Before Hurricane Katrina, the people in New Orleans based their identity on the school in which they attended. Mona mentioned "[In] the culturally rich city, education wasn't the end all, be all, or that it was great or fantastic, but New

Orleanians align themselves and identify themselves by their school." Now, suddenly, the schools that so many New Orleanians identify themselves with as youths were being taken over by large charter school management operators such as KIPP, First Line, and ReNew.

This change in operation resulted in many other school structural changes. Schools became more site based and performance driven, and resources differentiated as well. Administrators had to reevaluate the way they approached their duties, the students, the parents, and even their faculty and staff. Most of the special education programs trimmed the number of students get their services. The number of special education teachers was limited at that time. Curriculum and funding became a site-based battle, while traditional charter school landscapes were challenged. In effect, the influx of charter schools after Hurricane Katrina changed the educational landscape of New Orleans forever.

Culture

According to participant Mona, the culture of her school has become diverse as a result of Hurricane Katrina. Prior to the storm, the majority of her student body consisted of White students due to the school being located in an affluent uptown New Orleans neighborhood. Since the hurricane, the school has become all-encompassing by ushering in an assorted mix of students. This change was an initial shock to campus culture, but as Mona states, "…it's taken a while for the older people and parents and people who've been in the old culture to come around." Blending and coming together as one has made the charter school a staple in the community therefore allowing it to match the culturally rich atmosphere of the city.

In addition, Mona also spoke about how administrators were responsible for the campus culture, and how she believes this is a large part of why her school is successful. To gain student buy-in, administrators believed in school spirit. This was displayed in the form of school colors and student artwork placed throughout the hallways. A strong parental support also aided the school with student success; this can be attributed to ambitious teachers and administration. As far as the faculty culture goes, Mona stated, "I'm all about teamwork" and "teamwork makes the dream work." She believes it is the administrator's responsibility to facilitate an environment that provides a positive and conducive atmosphere for the learning environment.

Participant Nany's perspective of the culture differed from Mona. Nany works as special education teacher at a lower socioeconomic charter school and perceives that the school culture has declined since Hurricane Katrina. Prior to Hurricane Katrina, Mona felt that her coworkers were her family. Nany states, "There was no revolving door where every year there was a new set of teachers coming in. It was the same staff year after year. We may have had one or two people in or out for various reasons. Therefore, we were able to establish bonds amongst one another, that still to this day we are friends." Nany feels that post Hurricane Katrina the school system, specifically charter schools, "operate in that spirit of fear and intimidation." According to Nany, "…teachers are now afraid to share and afraid to ask others for support. They [teachers] are not aware if it is genuine or sabotage, because everyone now has to make themselves look good. Everybody data has to be awesome so that at the end of the year you'll get a letter saying that we want you to return… Instead of creating that culture you are creating

dissection among your teachers. Everybody works in isolation now. The very thing we were taught not to do."

Nany's frustration from a lack of a supportive culture in the New Orleans public school system has caused her to seek a new career. Prior to the storm Nany stated, "When I entered the teaching profession, my intent was to start at one school and retire from that one school." Now with the culture Nany reveals, "I am student at Delgado right now. I am up to my eyeballs in student loan debt and I will gladly borrow more money to get out of the teaching profession."

Collaboration

Mona attested that since Hurricane Katrina, "People who would normally be able to live and be a part of a neighborhood can no longer be that way after Katrina." This meant that the children in local neighborhoods might not attend the school just a few blocks away. Mona observed that this created a loss in the sense of community support and parental support. She believes that this change in culture and climate have also affected the parental collaboration. Mona stated, "Our parent community, I love them, but they are very demanding. The school is a responsibility to work and advocate for all children, not just one child. As a parent, you come to advocate for just one child."

Mona was quick to point out that the parents who could not provide this same level of involvement also affected this collaboration. According to her, "The parents are just involved to the extent that they could be. Parents of low performing schools, every parent sends us the best that they can." Mona believes it is her role as a special education teacher in the past and as an administrator now to navigate these two extremes and keep a collaborative environment between the school and parents. However, after Katrina there were many new faces that resulted in a loss that sense of family and collaboration.

Contradictory, Nany believes that after Katrina, there was a lack of both special and general education teachers support, and that some of the leaders became less collaborative with their staff. Nany mentioned that "Post Katrina – non-traditional leaders come with non-traditional ways and they want things implemented without collaboration or support from the teachers." This lack of educational background, she believes, led to an operation of fear which greatly influenced teacher collaboration.

On the other end of the spectrum, Mona believes that site-based management that is now present in schools allows her a certain level of autonomy which in turn allows her to give more power to her teachers. In Mona's school, she allows teachers to make most of the decisions that pertain to the classroom, and the faculty has frequent team collaboration meetings to ensure that this process is effective. She believes that the teachers are the experts in the classroom and that by giving them power over their own classrooms, it creates a better environment for collaboration and teacher buy-in which positively affect the school environment including special education programs.

Socioeconomic

Both participants viewed the financial aspects of the school system before Hurricane Katrina poorly. They spoke about the low pay teachers received and the conditions of the buildings they worked in. However, after Hurricane Katrina their experiences differed.

Mona stated, "Katrina was a blessing to New Orleans, it brought in funds to improve the buildings." Restructuring of buildings and students played a large part in how the money was allocated. As an administrator, Mona believes that she is very well compensated and that the system is better off.

Nany's account is very different, "I'm a contract employee, meaning I get to negotiate my salary." Even though she thought the pay was a little better, it was not fair. In her eyes, her experiences and expertise in the field of special education were not accounted for. She stated, "Before Hurricane Katrina there was a pay scale." She knew when she would receive her step increase (raise) and how much it would be.

In regards to resources, Nany felt that the availability of resources was dependent on which charter school you worked for and what resources your leader deemed important. She recounted experiences, with a principal who was very supportive and worked hard to make sure all resources were available to assist the academic learning process for both typical students and students with special needs. She also recounted experiences when she asked the administrator for additional resources and she was told to use the internet. Because Mona was an administrator her outlook differed from Nany. Mona's outlook on the financial aspect was global and positive. However, Nany's was more personal. Her thoughts were connected to how she and other teachers were personally affected. Although these two educators shared many similar experiences, their overall experiences have many differences.

Data Interpretation

After conducting my interviews, I found several common themes presented by the participants. These themes consisted of the participants' journey back home, the charter school movement, school culture, special education teacher / administrator collaboration, and financial implications. Although these themes were similar between both participants, their narratives show two very different experiences. What had caused these differences in their experiences? I analyzed the data, and found two main variations in their stories: the socioeconomic status of the school, and the approaches to administration of the school.

Administration & Leadership

During my interviews, Mona and Nany consistently placed emphasis on the role and importance of leadership in their experiences. In some schools, such as Mona's, administrators pushed a collaborative environment post Katrina that supported teachers and the rebuilding of their educational community. While Mona stated that there were some limitations due to the bureaucracy of education, she believed that the way in which an administrator handled that bureaucracy directly influenced collaboration in her school. "Yeah, there are some decisions that are going to have to be me, but I like to look at us like a circle where we are links in a chain and we are arm in arm." She also believed that choosing the right team was one of the important challenges facing the leaders of schools after the storm. "I hear horror stories all the time about 'oh we have an island of excellence' who likes to work on their own. But it's our job as leaders to find out what makes that person tick to get them to be a part of the culture and climate."

Nany, on the other hand, believed that lacking collaborative leadership ruined her perception of being a special education teacher. "[Pre-Katrina], I could get support from [other teachers] in the area of behavior, curriculum, and discipline because no one felt threaten by the other person. Post Katrina, it is totally opposite. There is no time to build those bonds." Nany believes that the demand for production, as opposed to teaching, is pitting teachers against each other in a "spirit of fear." "Nontraditional Leaders come with nontraditional ways and they want things implemented without collaboration or support from the teachers." "I don't trust the teachers I work with to help support my toolbox."

This type of plug and chug machine system creates serious issues for all involved (Etzioni, 1964; Freire, 1993; Mitzenberg, 1979; Morgan, 2007). First, it removes the natural abilities of teachers by making them vessels aimed at delivering watered-down content to student receptacles (Freire, 1993). When these teachers fail to perform as directed by administrators such as on standardized tests, they are removed and replaced with a new machine piece especially in the special education program, (Mintzberg, 1979; Morgan, 2007). This type of machine treatment breaks down the human spirit of the teachers and students, creating the feeling of competition as opposed to community that Nany described (Friere, 1993; Morgan, 2007). The administrator's role as a machine operator is to serve as the power structure needed to cultivate Nany's desire to educate students.

Analysis

From my narrative interviews, I concluded that socioeconomic status was a crucial element to educator's perception of the New Orleans public school system in general and of course special education programs in specific post Hurricane Katrina. Prior to Katrina, money was allocated from the district based on school needs and Title I funding. As a result of this, schools that were located in low-income neighborhoods were not diverse and did not receive adequate funding to assist with school improvement (Cowen Institute for Public Education Initiatives, 2013**).** Because of destroyed neighborhoods, the district did not have the capital to rebuild schools; consequently, there was an influx of charter schools formed.

Socioeconomic status (SES) and its effects on educational realization in the K-12 system have been investigated for several years (Walpole, 2003). Mitchell and Leachman (2015) disclosed that currently less funding is given per student in 34 states than prior to the recession. As a result of less funding, typical students and students with disabilities from lower SES circumstances not only suffer from a lack of resources at home but also suffer from minimum resources at schools. Many of the schools funded by property and local taxes in poor areas are unable to keep pace. Therefore, in order to sustain themselves after Hurricane Katrina, it was crucial that the surrounding environment be taken into consideration.

Open System

According to Lunenburg (2010), an open system is a system that has external interactions that consist of five basic elements: inputs, a transformation process, outputs, feedback, and the environment. The New Orleans Public School System faced various changes in aspects of operation such as the restructuring of school zones, financial funding, seizure by the Recovery School System, and the implementation of charter schools. New Orleans Public School System was directly impacted by its environment and had to restructure themselves to deal with the forces surrounding them. As a result of the environmental issues, the internal structure of the school system and the special education programs in the schools changed. Schools had to adapt to the lack of funds, shortage of general teachers, special education teachers, and students, as well as inadequate facilities. Morgan (2006) states that "The internal regulatory mechanism of a system must be diverse as the environment with which it is trying to deal. Only by incorporating required variety into internal controls can a system deal with the variety and challenge posed by its environment."

New Orleans has a history of being culturally rich and diverse city, but the school system was not always representative of this. Post Katrina, the school system has become more encompassing, where a diverse school according to Dreilinger (2015) is now one that has White students. Since the storm, there has been a 7 percent increase in White students in New Orleans public schools (Dreilinger, 2015). This increase could be contributed to the new way of managing schools as ascribed in contingency theory.

Contingency Theory

Adaptation to the environment is vital to an organization's survival. Contingency theory is based on the premise that organizations are open systems that need careful management to satisfy and balance the internal needs and environmental circumstances (Morgan, 2006). Therefore, it is important that there is a working relationship between all vested stakeholders. This relationship must consist of trust and mutual respect for all parties. Morgan (2006) states that the main underlying concepts in Contingency Theory are:

1. The best way of handling situations depends on the kind of task or environmental issues or concerns that the organization is dealing with;
2. Managements concern with attaining structure and good fits; and
3. Different approaches to management may be required to perform different tasks within the same organizations.

Based on this study, educators seemed more receptive to leaders who were task oriented, and student centered. Educators were also more accepting of leaders who were effective communicators, nurturing, supportive, and encouraging. These experiences varied between participants but were the underlying factors for success and intrinsic happiness.

Conclusion

From this study I learned that special educators' perspective varied differently post Hurricane Katrina. Prior to the storm, the nature of the public education system was not perfect but an intangible culture existed amongst faculty, staff, students, and parents. Following the storm, the perspective of both two special educators changed as a result of charter schools. These changes could be attributed to finances, administration, and school location. To better gauge these differences amongst educators, a broader sample size must be studied to better understand the perception of New Orleans educator's pre/post Hurricane Katrina.

References:

Beabout, B.R. (2007). Stakeholder organizations: Hurricane Katrina and the New Orleans
    Public Schools. *Multicultural Education, 15*(2), 43-49.

Beabout, B. R., Carr-Chellman, A. A., Alkandari, K. A., Almeida, L. C., Gursoy, H. T.,   Ma,   Z.,   &
Pastore, R. (2008). The perceptions of New Orleans educators on the
    process of rebuilding the New Orleans school system after Katrina. *Journal of   Education   for
Students Placed at Risk, 13*, 212-237.

Cowen Institute for Public Education Initiatives. (2013). The state of Public education in New Orleans:
        2013   Report   Retrieved   from   http://www.coweninstitute.com/wp-
        content/uploads/2013/07/2013_SPENO.pdf

Dreilinger, D. (2015, September 3). *Has gentrification begun in New Orleans public schools?.* Retrieved
        from http://www.nola.com/futureofneworleans/2015/09/bricolage_morris_jeff_interest.html

Etzioni, A. (1964). Administrative and professional authority. In *Modern Organizations*   (p.   75-84).
Englewood Cliffs, NJ: Prentice Hall.

Freire, P. (1993). Pedagogy of the oppressed (Rev. ed.). *New York: Continuum*, *1970*.

Hill, P., & Hannaway, J. (2006). The future of public education in New Orleans. In M. A. Turner & S. R.
Zedlewski (Eds.), *After Katrina: Rebuilding opportunity and   equity   into   the   NEW   New   Orleans.*
Washington, DC: The Urban Institute.

Lunenburg, F.C. (2010). Schools as open systems. *Schooling, 1*(1), 1-5.

Mintzberg, H. (1979). The professional bureaucracy. In *The Structuring of Organizations*   (p.   348-
379). Englewood Cliffs, NJ: Prentice-Hall.

Mirón, L. (2008). The urban school crisis in New Orleans: Pre and post Katrina perspectives. *Journal   of
Education for Students Placed at Risk*, *13*(2), 238-258.

Mitchell, M. & Leachman, M. (2015, May 13). *Years of cuts threaten to put college out   of reach for more
students.* Center on Budget and Policy Priorities. Retrieved   from   http://www.cbpp.org/research/state-
budget-and-tax/years-of-cuts-threaten-   to-put-college-out-of-reach-for-more-students

Morgan, G. (2007). *Images of organization*. Thousand Oaks, CA: Sage publications.

Newmark, K. G., & De Rugy, V. (2006). Hope after Katrina. *Education Next*,*6*(4).

Northouse, P. G. (2013). Leadership: Theory and practice. Thousand Oaks, CA: SAGE
        Publications.

Walpole, M. (2003). Socioeconomic status and college: How SES affects college experiences and
outcomes. *The Review of Higher Education, 27*, 45 – 73

Wynne, J.T. (2007). The winds of Katrina still call our names: How do teachers and   schools   confront
social justice issues? *Multicultural Education*, *15*(2), 50-51.

Participation of Students with Disabilities in College Ready Programs

Shaqwana Freeman-Green,
UNC Greensboro,
Greensboro, NC , USA
smfreem3@uncg.edu

David W. Test,
UNC Charlotte,
9201 University City Blvd,
Charlotte, NC , USA
dwtest@uncc.edu

Debra Holzberg,
UNC Greensboro,
Greensboro, NC , USA
dgholzbe@uncg.edu

Abstract

Benefits of graduating with a college degree include higher earnings, lower unemployment rates, improved health, and increased job satisfaction. A number of college-ready programs are offered to help prepare students for postsecondary education and careers (e.g., advanced placement, International Baccalaureate, dual enrollment, Tech Prep); however, little is known about the inclusion of students with disabilities in these programs. This study evaluated 15 college-ready programs to determine if they served students with disabilities, what program evaluation data indicated for students in these programs, and if program evaluation data were disaggregated for students with disabilities, what were the outcomes. Results indicated 12 of the programs resulted in successful preparation for postsecondary education; however, of the 15

programs reviewed, only two disaggregated data for students with disabilities. Implications for practice and directions for future research are discussed.

Introduction

College-ready programs are designed to help facilitate students' transition to college by preparing them to undertake college-level work upon entry. Given the poor post school outcomes of students with disabilities, unemployment or underemployment, lower pay, and job dissatisfaction is greater than that of their peers without disabilities (Sanford et al., 2011), it is important to examine their participation in college-ready programs. Many students with disabilities do not complete high school, leaving them less prepared for, and less likely to, obtain a job (Levinson & Palmer, 2005) and be equipped with the knowledge and skills to pursue continued education. According to the National Center for Education Statistics (2015), 46.6% of students age 20-24 years old without a high school diploma were reported to be working in 2014 as opposed to 63.7% of students who completed high school.

Given these outcomes, it seems clear that all students, including students with disabilities, need access to a rigorous program that prepare them to be college-ready. Benefits of graduating with a postsecondary degree include increased earnings (Carnevale & Desrochers, 2003), improved health (Mirowsky & Ross, 2010), and increased job satisfaction (Wolniak & Pascarella, 2005). In addition, data from the U.S. Department of Labor (2015) indicate an individual employed with a bachelor's degree is projected to have an annual income 1.5 times greater than that of a high school graduate's (i.e., $57,252 vs. $34,736), while an associate's degree increases earnings by approximately 15% (i.e., $41,184 vs. $34,736).

Recently, Sanford et al. (2011) found young adults in the general population were more likely to have been enrolled in four years colleges (37%) than were young adults with disabilities (15%). However, they found young adults with disabilities were more likely to have been enrolled in two years or community colleges (37%) or vocational school (28%) than were young adults in general education (21% and 17%). This interest in students with disabilities attending postsecondary education is also reflected in their individual education programs. For example, Cameto, Levine, and Wagner (2004) found postsecondary education was a primary post-school goal on transition components of the IEP for four out of five secondary students with disabilities. Based on these findings, it is imperative all students, including students with disabilities, have the opportunity to participate in rigorous programs that prepare them to be college-ready.
Conley (2012) has defined college readiness as a student's preparation for college and career and who can qualify for and succeed in entry-level, credit-bearing college courses leading to a baccalaureate or certificate or career pathway-oriented training programs without the need for remedial or developmental coursework. As the number of students with disabilities who aspire to attend postsecondary education increases, there is a corresponding need for need for rigorous high school programs to prepare those students for postsecondary education. The Education Commission of the States (ECS) Blueprint for College Readiness Report indicates that 25 states require all districts to offer advanced placement (AP), International Baccalaureate (IB), dual enrollment or other rigorous courses of study (Glancy et al., 2014).

As a result, it is important to determine if students with disabilities are participating in college ready programs, as well as their success in these programs. While college-ready programs such as AP courses and dual high school and college enrollment programs already exist, little is known about the inclusion and outcomes of students with disabilities in these programs. Therefore, the purpose of this study was to identify and review nationally available college-ready programs to determine (a) the extent to which students with disabilities participate, (b) the extent the programs are successful, and (c) the extent evaluation data are disaggregated for students with disabilities.

Method

We were interested in the preparation of students with disabilities for postsecondary education specifically examining nationally available college-ready programs. Based on these identified programs we wanted to see if students with disabilities were participating in these programs and to what extent were they successful. In order to investigate this further the following procedures followed.

Literature Search Procedure

This study used Conley's (2012) definition of "college-ready" programs as those whose focus is to provide high school students with knowledge and skills needed to succeed in entry-level, credit-bearing college courses without the need for remediation. To ensure a thorough search of the research literature on college-ready programs authors (a) conducted an electronic search, (b) hand searched selected peer reviewed journals to identify most current studies, and (c) reviewed reference lists of related articles. Disability was defined as:

> *...individuals with disabilities are defined as persons with a physical or mental impairment which substantially limits one or more major life activities. Major life activities include caring for one's self, walking, seeing, hearing, speaking, breathing, working, performing manual tasks, and learning.*
> http://www.hhs.gov/sites/default/files/knowyourrights504adafactsheet.pdf

Electronic searches were conducted using EBSCO HOST, Educational Research Complete, ERIC, Masterfile Premier, and PsychINFO. When searching electronic databases, the following are examples of full and truncated keyword search terms used: high school and college-ready, disabilities and high school programs, dual enrollment, advancement via individual determination, AVID and disability, advance placement and disability, 2 + 2 tech prep and disability. The authors searched for articles that included college-ready programs. Next, authors previewed titles and abstracts to identify potential articles. Finally, websites (e.g., Google, Bing, Yahoo) were searched for programs that prepared students for college.

To be included, programs had to meet the following criteria (a) a specifically stated purpose to prepare students for two or four-year college, (b) implemented nationally or available nationwide, and (c) availability of more than one published report in a peer reviewed journal or government sponsored document. Programs were excluded that were focused only on high school graduation or dropout prevention (e.g., Talent Development High Schools; Martinez & Klopott, 2005), not available nationally (e.g., Project "Graduation Really Achieves Dreams";

Martinez & Klopott, 2005), or no longer existed (e.g., EXCELerator). As a result, 15 programs were identified that met inclusion criteria. Once identified, searches were conducted to find the most recent program evaluation data to determine outcomes for all students, and then, if data were disaggregated for students with disabilities, what findings indicated.

Interobserver agreement (IOA)
During the first search, two authors determined if a study met the criteria for inclusion using a consensus model; disagreements were reconciled. Then, interrater reliability data were collected on eight of the 15 programs (53.3%). To calculate reliability, the number of agreements was divided by number of agreements plus disagreements and multiplied by 100. Reliability was 100%.

Results

Each of the 15 college-ready programs identified is described below. Descriptions are followed by summaries of the most recent research findings for each program, as well as disaggregated data for students with disabilities if available.

Advanced Placement

Advanced Placement (AP) programs are designed to offer high school students the opportunity to complete college-level work while still in high school (Barry et al., 2012). Passing scores on national exams may result in college credit upon enrollment in a college or university. While each AP class has its own eligibility requirements, a grade of A- or B+ in the high school honors version of the class is typically a prerequisite.

Sample research findings. Morgan and Klaric (2007) and Murphy and Dodd (2009) found students who took AP courses earned higher grades in introductory and subsequent college-level course work compared to students not enrolled in AP courses. Additionally, students who took AP courses, particularly those earning course credit or scoring a 3 or higher, attended more selective institutions, had higher college-level GPAs, and higher freshman-year retention rates (Murphy & Dodd, 2009). Finally, students taking two or three AP Exams were more likely to attend a four-year institution (Chajewski, Mattern, & Shaw, 2011). This finding was consistent across race/ethnicity and income groups (Dougherty, Mellor, & Jian, 2006).
While program evaluation data were available (Barry et al., 2012), data were disaggregated by socio economic status (Dougherty et al., 2006) and ethnicity (Morgan, & Klaric, 2007). Data were not disaggregated by disability.

Advancement Via Individual Determination

The Advancement Via Individual Determination (AVID) program is designed to increase college participation rates of minority and underprivileged populations (What is AVID, 2014). Students who are potential underachievers are supported, mentored, and coached to encourage high school completion. The AVID program is an academic elective class in middle and high schools that meets year-round. In order for students to participate in AVID, parents must sign a contract agreeing to support their child's participation in the program.

AVID impacts 800,000 students in 44 states (AVID.org, 2014). Within AVID classrooms students are provided: (a) special note and test-taking strategies and organization techniques (Hubbard & Mehan, 1999); (b) "social scaffolding" (i.e., providing a supportive developmental environment including cultivation of critical thinking skills; Oswald, 2002); and (c) help in completing college and scholarship applications and visits to college campuses (Swanson, Mehan, & Hubbard, 1993).

Sample research findings
AVID program evaluation data indicate three out of four AVID graduates, who applied, were accepted into 4-year colleges or universities nationally (Data and Results, 2014). Additionally, AVID students met four-year college entrance requirements at a rate at least two times higher than the national rate.

Each state participating in the AVID program provides data on the number of students enrolled, grade level, gender, ethnicity, and free or reduced price lunch. However, data are not disaggregated for students with disabilities (Data and Results, 2014).

Career Academies

The overarching goal of Career Academies is to prepare students in low-income, urban areas to successfully transition to postsecondary education and employment. Organized as small learning communities (i.e., 30-60 student per grade), Career Academies combine academic and career and technical curricula around a career theme (e.g., health sciences, business and finance, law, and engineering; mdrc.org). Partnerships with local employers are established to provide students with career awareness and work-based learning opportunities. An estimated 2,500 Career Academies operate either as a single program or as programs within a larger high school. Students apply to participate in a particular Academy in 9th or 10th grade and accepted applicants are taught by the same team of teachers for the duration of their high school career (Kemple & Willner, 2008).

Sample research findings
Kemple and Willner (2008) reported findings from a post-high school follow-up survey data collected approximately eight years post high school graduation. Findings indicated students in the Career Academy group, when compared to the control group earned 11% more per year. However, the effect was seen primarily in men; women's earnings were not statistically significant. Although high school completion rates were higher than national averages for Career Academy students, the increase was not statistically significant. Finally, data indicated Career Academies did not impact postsecondary education matriculation and completion rates. Data were not disaggregated for students with disabilities.

Dual Enrollment

Dual enrollment programs are designed to enable high school students to enroll in college courses and earn college credit while still in high school. Dual enrollment programs are based on five main principles: (a) education is a continuum in which the basics must be learned before proceeding; (b) courses offered through the programs supplement high school curriculum; (c) programs should be physically accessible to students; (d) financial support should be provided

when necessary; and (e) the school-college partnership should be enhanced with academic support such as academic advising and pre-college counseling, financial aid planning, assessment, and study skills workshops (Robertson, Chapman, & Gaskin, 2001). Widely accepted eligibility criteria for participating in dual enrollment programs include (a) passing the state's high school proficiency exam for that course, (b) attaining a minimum high school GPA (varies based on the school), and (c) recommendation from school personnel.

Sample research findings

Michalowski (2007) found participation in dual enrollment programs was positively correlated with high school graduation, college enrollment, credit accrual, persistence, and pursuing a bachelor's degree. Participants in career and technical education (CTE) focused dual enrollment programs were also more likely to enter college and earn higher grades than students who did not participate in the program (Karp et al. 2007). Finally, while Hart, Mele-McCarthy, Psternack, Zimbrich, and Parker (2004) examined 25 dual enrollment programs that included students with learning, cognitive, and intellectual disabilities, data were not disaggregated for these students with disabilities.

Early College High Schools

Early College High Schools are designed to increase the number of students who graduate from high school prepared for postsecondary education. This program targets students who are underrepresented in college (Jobs for the Future, 2015). Schools are designed so low-income youth, first-generation college goers, English language learners (ELLs), students of color, and other individuals who are underrepresented in higher education are able to earn a high school diploma and an associate's degree or up to two years of credit toward a bachelor's degree concurrently while receiving free tuition (AIR & SRI International, 2008). Early College High Schools are most frequently located on college campuses.

Sample research findings

Berger et al. (2013) found 86% of students who participated in Early College High Schools graduated from high school and 80% enrolled in college. Once enrolled in college, 21% of students earned a college degree (Berger et al., 2013). More recently, Webb and Gerwin (2014) found 90% of Early College High School student participants graduated from high school, 94% earned college credit while in high school, 71% enrolled in college the semester following graduation, and 30% earned a college degree (Webb & Gerwin, 2014). While Early College High Schools programs have been evaluated and students with disabilities have been included in analysis, data have not been disaggregated specifically for students with disabilities.

Gaining Early Awareness and Readiness for Undergraduate Programs The purpose of Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) is to increase the number of low -income, minority, and disadvantaged first-generation students prepared for postsecondary education. GEAR UP typically begins in middle schools, allowing students and families to access resources needed prior to high school coursework selection. GEAR UP provides early college awareness and support activities that may include (a) tutoring, (b) mentoring, and (c) financial education and college scholarships (National Council for Community and Education Partnerships, 2014).

Sample research findings

Over one million students in 47 states, District of Columbia, and three territories have been served in these programs (Gibson & Jefferson, 2006). Research indicated GEAR UP program participants were more likely to be prepared for college, know their options, have growth-fostering relationships, and higher self-concept (Gibson & Jefferson, 2006). A 4-year study of GEAR UP participants indicated students were more knowledgeable of postsecondary options and had higher aspirations for postsecondary education (Finch & Cowley, 2003). While outcome data were reported by race and socioeconomic status, data were not disaggregated for students with disabilities.

High School/High Tech

First established in 1983 by local business leaders in Los Angeles who sought to reach out to students with disabilities to engage them in technological and science-based careers, and later (1995) supported by NASA funding to California, Florida, Georgia, Maryland, and Ohio, High School/High Tech (HS/HT) has been designed to prepare students with disabilities for postsecondary education. The program focuses on maintaining high expectations, exposes youth to possible STEM careers, works to develop leadership, and encourages involvement of family and caring adults. The program runs year-round and conducts activities either in school, after school, on weekends, and during the summer. Additionally, HS/HT offers college and career planning information and guidance.

Sample research findings

Karakus, Elinson, Frey, and Collins (2008) found that during the 2006-2007 academic year, 39.4% of HS/HT participants graduated high school, 44.9% did not graduate, and they were unable to determine completion status for 15.8% of the participants. Student data were disaggregated based on primary disability and co-morbid health problems or disabilities; however, outcome data were not disaggregated.

Data collected from The Able Trust (2015) on post-school outcomes of students participating in the HS/HT Program are encouraging. The program served 1,282 students with disabilities in 40 Florida counties in the 2014-2015 school year. The Florida HS/HT Program participants experienced a graduation rate of greater than 99% of all participating seniors. Additionally, 72% of Florida HS/HT graduates received a standard diploma compared to 60% of their peers with disabilities. Finally, 62% of Florida HS/HT graduates enrolled in postsecondary education compared to 28% of non-HS/HT graduates with disabilities.

High Schools That Work

High Schools That Work (HSTW) programs are designed to "improve the communication, mathematics, science, technical, and problem-solving skills of career-bound youth," and to "close, by one-third, the gap in reading, mathematics, and science achievement between career-bound students and college-preparatory students nationally" (Bottoms & Mikos, 1995, p. 3). The goal of HSTW programs is to end all low-level courses for all students, including those with disabilities (Southern Regional Education Board, 2003).

To date more than 1,200 HSTW sites in 30 states and the District of Columbia have used

the HSTW framework (Young, Cline, King, Jackson, & Timberlake, 2011). Successful programs set high standards for students and help them reach those standards, increase students' access to more challenging course work, create a strong partnership between school and home, and make learning meaningful through challenging and engaging classroom assignments.

Sample research findings

According to Martinez and Klopott (2005), despite early student gains in HSTW schools, the minority achievement gap between African American and White students persisted. Although enrolling in college preparatory classes at the same rate as White students, African American students were meeting HSTW achievement goals at nearly half the rate of White students over a 10 year span. Miller and Mittleman (2012) conducted a rigorous comparative interrupted time series strategy of 18 HSTW schools in North Carolina between 2000 and 2006 to determine the degree to which HSTW increased students' progression through the mathematics and science pipelines. According to the authors,

> *...we are unable to find clear evidence that HSTW implementation increased students' success in the college preparatory pipeline. Instead, we find no effect on the average student's course taking and tested mastery, and some evidence of an increased gap in course taking patterns between advantaged and disadvantaged students* (p. 1125).

While data were disaggregated by race/ethnicity, they were not disaggregated by disability.

Institute for Student Achievement

The Institute for Student Achievement (ISA) is a nonprofit organization that partners with schools and districts to prepare historically underserved (i.e., African American and Latino) students to be college and career ready. Schools are transformed into small learning communities designed to sustain "intellectually rigorous, caring, and personalized learning environments" (Fancsali et al., 2012, p. 1). Three implementation strategies overarch ISA's seven research-based principles. First, College Prep Teaching & Learning includes: college preparatory instructional program, extended school day and school year, and continuous professional development. Second, Building Relationships and Personalization includes: Distributed Counseling^{TM}, dedicated team of teachers and counselors, and parent involvement. Third, Continuous Improvement includes: continuous organizational improvement by monitoring progress and refining aspects of the program. Currently, ISA works with 80 partner schools serving 20,000 students in school districts in Georgia, Louisiana, Maryland, Michigan, New Jersey, and New York (Fancsali et al., 2012).

Sample research findings

Data from the ISA Outcome Evaluation Final Report (2010) using matched sample groups, indicated ISA's partnerships with two New York City schools yielded improved postsecondary outcomes for students. Ninety percent of seniors reported plans to attend either a two- or four-year college after graduation; 61% enrolled in four-year colleges (compared with 44% of African American and Latino students nationwide). Furthermore, 80% of ISA students attended college full-time during the first year and 94% of those students attending a four-year school returned for a third semester (Fancsali & Bat-Chava, 2010).

The ISA Outcome Study Report (2012) looked at student achievement records from New York City and Atlanta. College enrollment data for ISA students exceeded national enrollment rates. For example, of all students enrolling in college, 28% of students in 2007 ISA cohort enrolled in two-year college and 72% enrolled in four-year college as opposed to the national average of 43% and 57% respectively. Finally, college persistence rates for ISA students exceeded the national average; 89% of the 2007 ISA cohort persisted from fall of their first year to fall of their second year compared to the national average of 77% persistence (Fanscali et al., 2012). Data for both studies indicated program participation by students with disabilities (i.e., 11% [2010 report] and 13.1% [2012 report]); however, data were not disaggregated by disability.

International Baccalaureate Diploma Program

The International Baccalaureate (IB) Diploma Program (DP) is an academically challenging education program for students aged 16 to 19. It is a rigorous high school curriculum that includes foreign language study, literature, science, math, and social studies. The curriculum is typically taught over two years and upon completion students earn an IB diploma (IB Global Research Department, 2013). Additionally, students may receive college credit if their subject test scores meet the institution's criteria. Each IB school has its own entrance/eligibility requirements for admission; however, only students enrolled in an IB World School may participate in an IB Program.

Sample research findings
The IB Diploma Program has been thoroughly researched; a Bergeron (2015) found that students who participated in the IB DP enrolled in postsecondary education at a rate of 78% compared to the national average of 69%. Retention rates indicated that 96% of IB DP students remained in college compared to the national rate of 77%. Finally, the 6-year graduation rate for IB DP students was 83% while the national average was 56%. Available data from the Office of Civil Rights (2015) indicated in the 2009 – 2010 school year, 3,295 students served under IDEA were enrolled in the IB DP, findings were not disaggregated for students with disabilities.

Junior Reserve Officer Training Corps (JROTC)

The Junior Reserve Officer Training Corps (JROTC) is a high school program funded by local school districts and the Department of Defense (Pema & Mehay, 2010) that focuses on character education, student achievement, wellness, discipline, and leadership. Students can enter the JROTC program at any point in their high school career and upon graduation, there is no obligation to enlist.

JROTC provides educational opportunities to help cadets develop lifelong skills such as leadership and decision-making. The curriculum aligns with Common Core State Standards and includes courses in leadership, civics, geography and global awareness, health and wellness, language arts, life skills, and U.S. history. Curricular goals are reinforced though service-learning projects and co-curricular activities after school and on weekends. One of the anticipated outcomes for participation in JROTC is success in post-secondary options.

Sample research findings

Pema and Mehay (2009) used data from the High School and Beyond (HSB) and the National Educational Longitudinal Survey (NELS) to gain information on courses completed and academic achievement. Data study indicated JROTC students have lower postsecondary enrollment rates than their equally matched peers who did not participate in JROTC programs.

Next, Pema and Mehay (2010) found program effects were contingent upon length of participation. Students who spent more time in the program experienced better outcomes than those who spent less time in the program. Findings indicated participants, regardless of time of enrollment, improved test scores; however, only students who enrolled early in JROTC had improved graduation rates. Consistent with the Pema and Mehay (2009), postsecondary enrollment was lower for JROTC cadets. While data from both studies were disaggregated by demographic information, they were not disaggregated for students with disabilities.

Project Lead the Way

Project Lead the Way (PLTW) provides innovative Science, Technology, Engineering, and Mathematics (STEM) education in middle and high schools across the country. Professionals from local industries supplement real-world aspects of the curriculum through mentorships and workplace experiences (PLTW, 2014). The curriculum promotes critical thinking and problem solving skills. To be eligible, schools must apply to become a PLTW school (Shannon & Dalat Ward, 2012; Tai, 2012).

Sample research findings

Van Overschelde (2013) evaluated data using matched samples from PLTW schools in Texas. Data indicated PLTW students enrolled in Texas institutes of higher education (IHE) at a higher rate (i.e., M = 62.1% compared to M = 58.4% non-PLTW students). Additionally, although enrollment based on gender was significant for non-PLTW students, this effect was not seen in PLTW student enrollment. Data were not
disaggregated for students with disabilities.

Talent Search

Part of the US DOE's TRIO programs, Talent Search utilizes a combination of services to help low-income students, ages 11– 27, become first-generation college students. Resources such as tutoring, test taking and study skills assistance, academic advising, career development, college visits, and assistance with financial aid applications are provided to help students improve academic achievement, complete high school, and increase access to financial aid. Inclusion criteria include completing the fifth grade, low-income background, and/or potential first generation college goer.

Sample research findings

Constantine, Seftor, Martin, Silva, and Myers (2006) evaluated the impact of the Talent Search on secondary and postsecondary outcomes in Florida, Indiana, and Texas as measured by first-time financial aid application. Data indicated the enrollment of Talent Search participants in postsecondary education was 14% (Florida), 6% (Indiana), and 18% (Texas) higher than nonparticipants (i.e., the comparison group). Although participant data were disaggregated by

disability status (e.g., learning disabled, emotionally or physically disabled), outcome data were not.

Annual Performance Report data from the US DOE (2013) evaluated reported data from institutions who received project funding. The 2010-2011 cohort achieved a postsecondary education enrollment rate of 80.1%. In the 2011-2012 cohort, 79.8% of students went on to enroll in postsecondary education. More recently, 2012-13 in the school year, 80.6% of participating students enrolled in postsecondary education. Although data were reported on disability status, findings for students with disabilities were not reported.

Tech Prep

Tech Prep, funded by the US DOE, is a planned sequence of study in a technical field beginning as early as the ninth grade. Students take two years of postsecondary occupational education or an apprenticeship program following secondary instruction; culminating with an associate's degree or certificate. Tech Prep offers high school or community college curriculum in professional or technical fields. One goal is to reduce duplication between high school and college so students have a seamless transition between systems. Students have the opportunity to earn college credit for approved high school courses, and may earn credits toward a degree at a community college or four-year college or university (US DOE, 2009). Eligibility criteria for students include (a) being a high school junior or senior, (b) completing an eligible career and technical course at the high school level with a grade A or B and satisfy specific course competencies, and (c) filling out a Tech Prep admissions form from the local community college (US DOE, 2009).

Sample research findings

Brown-Lerner and Brand (2006) compared Tech Prep with non-Tech Prep career and technical education students and general education students. Results indicated Tech Prep students had higher attendance rates, lower dropout rates, and higher graduation rates with more Tech Prep students also completing the college preparatory curriculum. When data were disaggregated by subgroups based upon ethnicity and special population categorization, defined by the researchers as "at-risk, economically disadvantaged, bilingual/ESL, special education, and all other students" these same findings held true (Brown-Lerner & Brand, 2006).

Upward Bound and Upward Bound Math-Science

The purpose of Upward Bound programs, part of the US DOE's TRIO programs, is to engender the necessary skills and motivation for success in postsecondary settings for youth from low-income backgrounds. Upward Bound programs require two-thirds of participants be low-income (150% of the poverty line) and potential first-generation college goers. The remaining participants must be either low-income or first-generation college goers. Students usually enter Upward Bound programs early in their high school career, participate in activities during the school year, and typically attend a six-week academic program during the summer which focuses on projects to acquire prerequisite academic skills necessary to attend and complete college. Projects may include preparation for college entrance examinations, college campus tours, and learning about the financial aid application process.

Sample research findings

Findings from Upward Bound programs have been mixed. First, Pell Institute (2009) found participants in Upward Bound were "50% more likely to attain a bachelor's degree (21.1% vs. 14.1%), 19% more likely to attain any postsecondary degree or credential (49.3% vs. 41.5%)" (p. 4). Conversely, Mathematica Policy Research (2009) indicated no effect on overall enrollment into postsecondary education for students attending Upward Bound programs (Seftor, Mamun, & Schirm, 2009). Finally, the Institute for Research on Poverty (Harris, Nathan, & Marksteiner, 2014) reported:

> *It is now clear why the conclusions from the UB experiment about average treatment effects have been so controversial. The original study drew its main conclusions from its pre-specified design even though the implementation of that design apparently yielded biased estimates of the population average treatment effects…It would therefore seem that the conclusions of both the original report and responses by critics are both too strong* (p. 38).

None of the studies included disaggregated data based on disability.

Discussion

The purpose of this study was to identify and review nationally available college-ready programs to determine (a) what program evaluation data indicated for students in these programs, and (b) if program evaluation data were disaggregated for students with disabilities, what data indicated for these students. Of the 15 programs identified and reviewed, only 12 demonstrated consistently positive outcomes in preparing students for postsecondary education. Four programs (i.e., High Schools That Work, Junior Reserve Officer Training Corps, Tech Prep, Upward Bound and Upward Bound Math-Science) had mixed effects in preparing students to be college-ready.

Of the 15 college-ready programs, all indicated they served students with disabilities. However, only two programs (i.e., High School/High Tech, Tech Prep) provided disaggregated data for students with disabilities. First, High School/High Tech programs are geared specifically towards preparing students with disabilities for postsecondary education – particularly in STEM fields. Although HS/HT programs serve students with disabilities, data are not consistently disaggregated by disability category. For example, McQuillen et al. (2001) reported a range of 83.3% - 56.5% of participating students attended postsecondary education; however, the disability categories served were not reported. However, data reported by Florida HS/HT (2015) indicate that 8% of enrolled students were identified with autism spectrum disorder, 17% cognitive impairment, 2% deaf/blind, 3% emotional disturbance, 1% hearing impairment, 1% multiple disabilities, 13% other health impairment, 5% orthopedic impairment, 39% specific learning disability, 5% speech or language impairment, 1% traumatic brain injury, and 3% visual impairment/blindness.

For Tech Prep programs, Brown-Lerner and Brand (2006) found students with disabilities had higher attendance rates, lower dropout rates, and high graduation rates when they participated in this program. However, outcome data were not specifically disaggregated by disability type.

Eleven of the 15 programs were at one time, or are currently, federally funded (AP, AVID, Career Academies, Dual Enrollment, GEAR UP, HS/HT, IB, JROTC, Talent Search, Tech Prep, and Upward Bound/Upward Bound Math and Science). Of the 11 programs, only two provided data that were disaggregated by disability. This oversight will soon be remedied since beginning with the 2015-2016 school year, the Office of Civil Rights required data disaggregated by race, sex, disability-IDEA, and limited English proficiency (LEP) and reported on the number of students enrolled in (a) at least one dual enrollment/dual credit program, (b) the IB Diploma Program, (c) at least one AP course, (d) number of students who passed one or more AP exam, and (e) number of students who did not pass any AP exams for one or more AP courses in which they are enrolled. These data will provide administrators and policymakers with information to determine the impact of these college-ready programs on all students participating in these programs.

Of the 15 programs evaluated, the overarching theme was increased college-readiness or increased enrollment in postsecondary educational institutions. Five programs (i.e., Dual Enrollment, Early College High School, High School/High Tech, Institute for Student Achievement, and International Baccalaureate Diploma Program) were associated with increased graduation rates. Both AP and Dual Enrollment indicated students achieved higher grade point averages in postsecondary education as a result of the program.

Limitations and Suggestions for Future Research

One limitation of this study was the inclusion of strictly nationally available programs or programs that had more than one published report available in either a peer reviewed journal or government sponsored document. While these criteria excluded some programs available only in specific geographical locations, these could be included in future reviews of college-ready programs. Doing so might encourage more widespread adoption of programs with positive outcome data for all students, including students with disabilities.

Second, by focusing on national programs that explicitly stated a goal of preparing students to be college-ready, the present study may have limited the number of programs identified. Future studies are needed to look at programs that claim to prepare students to be college "and career" – ready, since not all students choose college as the next step after high school. Future researchers might consider starting with the College and Career Readiness and Success Center's Interactive Site Map (http://www.ccrscenter.org/ccrs-landscape/state-profile) which includes each state's definition of college and career ready, metrics, and programs and structures.

Finally, while most programs did disaggregate data based on gender and ethnicity, future research on college-ready programs must disaggregate data for students with disabilities to determine the impact the program has on all students. Researchers should examine specific characteristics of programs to determine the most effective strategies for students with disabilities. Longitudinal studies would add to the evaluation of the long-term outcomes of these programs to determine if the strategies and skills taught generalize into postsecondary educational settings.

Implications for Practice

Data reported in this study indicate college-ready programs can successfully prepare high school students to graduate ready to succeed in postsecondary education. However, little is known about the impact of these programs on students with disabilities since only two disaggregated data for students with disabilities. As a result, high schools and school systems must be responsible for collecting, analyzing, and reporting these data for college-ready programs located in their schools. Without data disaggregated for all students, administrators cannot be certain programs are preparing all students to be college-ready.

Next, by looking across the major characteristics of programs reviewed, it appears successful college-ready programs implement a number of strategies. These strategies include the ability to earn college credit while in high school, smaller class sizes, a focus on academic content, teacher academic support skills (e.g., note-taking, test-taking, critical thinking), and involving families, and community/business partnerships (e.g., mentorships, internships). These strategies can be incorporated into any existing middle school or high school program.

Conclusion

It is imperative all students have access to college-ready programs so they are prepared to participate in postsecondary education. Data indicate most nationally-available college-ready programs do successfully prepare high school students to graduate ready for postsecondary education. However, little is known if these outcomes extend to students with disabilities since only two programs disaggregated data for students with disabilities. It is now time to evaluate these possibilities for students with disabilities.

References:

American Institutes of Research & SRI International. (2008). *2003–2007 Early college high school initiative evaluation: Emerging patterns and relationships*. Washington, DC: Author.

Barry, C., Bausmith, J., Cooney, S., Laitusis, V., Matos-Elefonte, H., McKillip, M., … Rawls, A. (2012). *Research on college board programs and services: Annotated bibliography 2012*. New York, NY: The College Board.

Berger, A., Turk-Bicakci, L., Garet, M., Knudson, J., Haxton, C., Zeiser, K., … Cassidy, L. (2013). *Early college, early success: Early college high school initiative impact study.* Washington, DC: American Institutes for Research.

Bergeron, L. (2015). *Diploma Programme students' enrollment and outcomes at US postsecondary institutions 2008-2014*. Retrieved from http://www.ibo.org/globalassets/publications/ib-research/dp/dp-student-enrollment-outcomes-us-en.pdf

Bottoms, G., & Mikos, P. (1995). *Seven most improved high schools that work sites raise achievement in reading, mathematics, and science: High schools that work, a report on improving student learning.* Atlanta, GA: Southern Regional Education Board

Brown-Lerner, J., & Brand, B. (2006). *The college ladder: Linking secondary and postsecondary education for success for all students.* Washington, DC: American Youth Policy Forum.

Cameto, R., Levine, P., & Wagner, M. (2004). *Transition planning for students with disabilities*. Menlo Park, CA. SRI International. Retrieved from http://www.nlts2.org/reports/2004_11/index.html.

Carnevale, A. P., & Desrochers, D. M. (2003). *Standards for what? The economic roots of K-16 reform.* Educational Testing Service. Retrieved from http://www.learndoearn.org/For-Educators/Standards-for-What.pdf

Chajewski, M., Mattern, K. D., & Shaw, E. J. (2011), Examining the role of advanced placement®exam participation in 4-Year college enrollment. *Educational Measurement: Issues and Practice*, *30*, 16–27. Doi: 10.1111/j.1745-3992.2011.00219.

Conley, D. (2012). *A complete definition of college and career readiness*. Retrieved from http://www.epiconline.org/

Data and Results. (2014). Retrieved from http://www.avid.org/data-and-results.ashx

Dougherty, C., Mellor, L., & Jian, S. (2006). *The relationship between advanced placement and college graduation*. AP Series, Report 1. Austin, TX: The National Center for Accountability.

Educational Policy Improvement Center (EPIC). (2012). http://www.epiconline.org/

Fancsali, C., & Bat-Chava, Y. (2010). *Findings from the Institute for Student Achievement outcome evaluation final report*. Retrieved from http://www.studentachievement.org/wp-content/uploads/ISA_final_report_20101.pdf

Fancsali, C., Snipes, J., Zhang, Y., Stoker, G., Ortiz, L., & Orellana, E. (2012). *Institute for student achievement ISA outcome study final report*. Retrieved from http://www.studentachievement.org/wp-content/uploads/ISA-outcome-study-Final-Report-2012.pdf

Finch, N. L., & Cowley, K. S. (2003). *Fairmont State College GEAR UP Project: Year 4 baseline seventh-grade survey and tenth-grade follow-up survey (2002-2003)*. Gaining Early Awareness and Readiness for Undergraduate Programs.

Gibson, D. M., & Jefferson, R. N. (2006). The effect of perceived parental involvement and the use of growth-fostering relationships on self-concept in adolescents participating in gear up. *Adolescence*, *41*, 111-125.

Glancy, E., Fulton, M., Anderson, L., Dounay Zinth, J., Millard, M., & Delander, B. *Blueprint for college readiness* (Denver, CO: Education Commission of the States, October 2014). http://www.ecs.org/docs/ECSBlueprint.pdf

Harris, D., Nathan, A., & Marksteiner, R. (2014). *The Upward Bound College Access Program 50 years later: Evidence from a national randomized trial*. Institute for Research on Poverty. Madison, WI. Retrieved from: http://www.irp.wisc.edu/publications/dps/pdfs/dp142614.pdf

Hart, D., Mele-McCarthy, J., Pasternack, R. H., Zimbrich, K., & Parker, D. R. (2004). Community college: A pathway to success for youth with learning, cognitive, and intellectual disabilities in secondary settings. *Education and Training in Developmental Disabilities*, *39*, 54–66.

Hubbard, L., & Mehan, H. (1999). Scaling up an untracking program: A co-constructed process. *Journal of Education for Students Placed at Risk*, *4*, 83-101.

Institute of Education Sciences, National Center for Education Statistics. (2015). *Employment to population ratios of persons 16 to 64 years old, by age group and highest level of educational attainment: Selected years, 1975 through 2014.* Retrieved from http://nces.ed.gov/programs/digest/d14/tables/dt14_501.50.asp

International Baccalaureate (IB) Global Research Department. (2013). *Research related to the international baccalaureate*. Retrieved from http://www.ibo.org/about-the-ib/research/

Jobs for the Future. (2015). *Reinventing high schools for postsecondary success*. Retrieved on November 17, 2015 from http://www.jff.org/initiatives/early-college-designs

Karp, M. M., Calcagno, J. C., Hughes, K. L., Jeong, D. W., & Bailey, T. R. (2007). *The postsecondary achievement of participants in dual enrollment: An analysis of student outcomes in two states.* St. Paul, MN: National Research Center for Career and Technical Education (NRCCTE), University of Minnesota.

Kemple, J. J., & Willner, C.J. (2008). *Career Academies: Long-term impacts on labor market outcomes, educational attainment, and transitions to adulthood*. Retrieved from http://www.mdrc.org/sites/default/files/full_50.pdf

Levinson, E. M., & Palmer, E. J. (2005). Preparing students with disabilities for school-to-work transition and postschool life. *Principal Leadership*, *5*, 11–15.

Martinez, M., & Klopott, S. (2005). *The link between high school reform and college access and success for low-income and minority youth*. Washington, DC: American Youth Policy Forum and Pathways to College Network.

McQuillen, T., Nietupski, J., Berg, D., Daugherty, V., & Bildstein, S. (2001). *Iowa high school high tech: Promoting careers in technology for students with disabilities. Final report and implementation manual*. Grant Wood Area Education Agency, Cedar Rapids, IA.

MDRC (2015). *Career academies: Exploring college and career options (ECCO)*. Retrieved from http://mdrc.org/project/career-academies-exploring-college-and-career-options-ecco#overview

Michalowski, S. (2007*). Positive effects associated with College Now participation for students from New York City high schools: Fall 2003 first-time freshman cohort*. New York: CUNY Collaborative Programs, Office of Academic Affairs.

Miller, L. C., & Mittleman, J. (2012). High Schools That Work and college preparedness:

Measuring the model's impact on mathematics and science pipeline progression. *Economics of Education Review*, *31*, 1116-1135.

Mirowsky, J., & Ross, C. E. (2010). Self-direction toward health: Overriding the default American lifestyle. In J. M. Suls, K. Davidson, & R. Kaplan (Eds.), *The handbook of health psychology* (pp. 235–250). New York: Guilford Press.

Morgan, R., & Klaric, J. (2007). *AP® Students in College: An Analysis of Five-Year Academic Careers (College Board Research Report 2007-4)*. New York: The College Board.

Murphy, D., & Dodd, B. (2009). *A comparison of college performance of matched AP and non-AP student groups (Report No. 2009-6).* New York: The College Board.

National Council for Community and Education Partnerships (2014). *About GEAR-UP*. Retrieved from http://www.edpartnerships.org/gear-up

Office for Civil Rights. (n.d.)   Retrieved from http://ocrdata.ed.gov/downloads/projections/2009-10/2009-10-Estimations-Nation.xls

Oswald, K. J. (2002). *The AVID program in AISD, 1999-2002*. Austin Independent School District, TX, Office of Program Evaluation.

Pema, E., & Mehay, S. (2009). The effect of high school JROTC on student achievement, educational attainment, and enlistment. *Southern Economic Journal*, *76*, 533-552.

Pema, E., & Mehay, S. (2010). The impact of the high school Junior ROTC program: Does treatment timing and intensity matter? *Defence and Peace Economics*, *21*, 229-247.

Project Lead the Way. (2014). Retrieved from https://www.pltw.org/

Robertson, P. F., Chapman, B. G., & Gaskin, F. (2001). *Systems for offering concurrent enrollment at high schools and community colleges.* New Directions for Community colleges, No. 113. San Francisco: Jossey-Bass.

Sanford, C., Newman, L., Wagner, M., Cameto, R., Knokey, A.-M., & Shaver, D. (2011). *The post-high school outcomes of young adults with disabilities up to 6 years after high school. Key findings from the National Longitudinal Transition Study-2 (NLTS2)(NCSER 2011-3004)*. Menlo Park, CA: SRI International

Seftor, N., Mamun, A., & Schirm, A. (2009). *The impacts of regular Upward Bound on postsecondary outcomes 7-9 years after scheduled high school graduation. Final report.* Mathematica Policy Research. Princeton, NJ.

Shannon, L. J., & Dalat Ward, Y. (2012). *Bridging game-programming into the K-12 curriculum*. In Proceedings of the Information Systems Educators Conference ISSN (Vol. 2167, p. 1435).

Southern Regional Education Board. (2003). *High schools that work: key practices.* Retrieved from http://www.sreb.org/page/1078/high_schools_that_work.html

Swanson, M.C. Mehan, H., & Hubbard, L. (1993). *The AVID classroom: A system of academic and social supports for low-achieving students.* Retrieved from ERIC.

Tai, R. H. (2012). *An examination of research literature on PLTW*. University of Virginia. Publication by PLTW.

The Pell Institute. *National Studies Find TRIO Programs Effective at Increasing College Enrollment and Graduation.* Retrieved from: http://www.pellinstitute.org/publications-Studies_Find_TRIO_Programs_Effective_May_2009.shtml

U.S. Department of Education. (2009). *Tech prep education*. Retrieved from http://www2.ed.gov/programs/techprep/index.html

U.S. Department of Education Office for Civil Rights (2014) *Civil Rights Data Collection: Data Snapshot (College and Career Readiness)*. Retrieved from: http://ocrdata.ed.gov

U.S. Department of Education, Office of Planning, Evaluation and Policy Development, Policy and Program Studies Service. (2006). *A study of the effect of the Talent Search program on secondary and postsecondary outcomes in Florida, Indiana and Texas: Final report from Phase II of the National Evaluation*, Washington, D.C. Retrieved from https://www2.ed.gov/rschstat/eval/highered/talentsearch-outcomes/ts-report.pdf

U.S. Department of Labor, Bureau of Labor Statistics. (2015). *Earnings and unemployment rate by educational attainment*. Retrieved from http://www.bls.gov/emp/ep_chart_001.htm

Van Overschelde, J. P. (2013). Project Lead the Way students more prepared for higher education. *American Journal of Engineering Education*, *4*, 1-12.

What is AVID? Retrieved from http://www.avid.org

Webb, M., & Gerwin, C. (2014). *Early college expansion: Propelling students to postsecondary success, at a school near you*. Washington, DC: Jobs for the Future.

Wolniak, G. C., & Pascarella, E. T. (2005). The effects of college major and job field congruence on job satisfaction. *Journal of Vocational Behavior*, *67*, 233-251.

Young, J. W., Cline, F., King, T. C., Jackson, A. D., & Timberlake, A. (2011). *High Schools That Work: Program description, literature review, and research findings*. Princeton, NJ: Educational Testing Service.

Elementary School Teachers' Perceptions of Public Inclusive Elementary School Readiness Formation

Rasmitadila,
Djuanda University,
Indonesia

Anna Riana Suryanti Tambunan,
Universitas Negeri Medan,
Indonesia

Reza Rachmadtullah,
Adi Buana University,
Indonesia

Abstract
The purpose of this study was to explore teachers' perceptions of the level of readiness and the factors that constrain the state elementary schools to become inclusive elementary schools. This study used a quantitative approach with the type of survey research involving 115 respondent,s public elementary school teachers in the area of Bogor City and Bogor Regency, West Java, Indonesia. Selection of respondents used random multistage cluster technique. Data collection was conducted using an open questionnaire. Data were analyzed using descriptive analysis with percentages. The results of the study found that the level of readiness of public elementary schools to become inclusive elementary schools consisted of three categories: ready (20%), not ready (49.60%), unprepared (30.40%). Factors that become constraints in the formation of public elementary schools to be inclusive elementary school consist of six factors, namely: availability of supporting facilities and infrastructure (24.35%), teacher skills (23.48%), availability of special assistant teachers (20%), parents' mind set and the community (14.78%), availability of funds (9.57%), government involvement (7.82%). The establishment of a public elementary school into an inclusive elementary school is not ready to be carried out because it still encounters obstacles that must continue to be considered by the government, schools and the community.

Keywords*: elementary school teacher, inclusive education, inclusive school*

Introduction

Inclusive education is a form of educational service that provides equal rights, and justice for all children in order to get education in accordance with all the advantages and disadvantages. Through inclusive education, all children who have differences and characteristics can fully follow learning so that the value of education improves (Hardy & Woodcock, 2015; Robo, 2014). Inclusive education is an approach that provides fundamental changes to the educational framework and learning situations that can accommodate the diversity of all students (UNESCO, 2005). The realization of inclusive education is implemented in the establishment of inclusive schools. Inclusive schools aim to provide every child educational services, embrace all diversity, celebrate differences with all the characteristics, advantages and disadvantages (Graham & Harwood, 2011; Clear & Mohd Ali, 2014). In the Salamanca Statement (1994), it is stated that inclusive schools are very effective and efficient schools in achieving education for all and expected to succeed in opposing feelings of unfairness, building a society that is friendly in diversity. Inclusive schools emphasize the provision of just education services to all children, both in terms of the curriculum, learning process, assessment and intervention with several behaviours that are adapted to the characteristics and obstacles for children. In addition, each child will be trained in a sense of empathy and sympathy when faced with differences and obstacles, so that mutual respect for the shortcomings of others can be in line with mutual respect for each peer. Students are trained to be able to help each other, work together in understanding the difficulties and disabilities of other students, which is expected to be maintained in the future.

For this reason, the implementation or establishment of inclusive schools is a necessity that cannot be postponed in order to accommodate the needs of all children because of the increasing number of children with special needs who need attention in education services. Consequently, a number of changes such as curriculum preparation, teacher skills improvement, school facilities and infrastructure and effective learning strategies must be designed in order to meet the needs of the inclusive school (Winter & O'Raw, 2010). However, these changes also have obstacles that must be faced, including the provision of large funds for each school, so that the implementation and establishment of inclusive schools is still small.

According to UNICEF data, more than 80% of children with special needs live in developing countries that have very little or no access to education services that suit their needs. The government's task is very limited and difficult in the implementation of inclusive schools, due to limited funds, facilities and infrastructure, inadequate human resources that have competencies that are appropriate to their fields, as well as low community involvement in understanding inclusive education (UNESCO, 2017). Inclusive education according to the Regulation of the Minister of National Education of the Republic of Indonesia Number 70 of 2009 Article 1 is:

> *"an education system that provides opportunities for all students who have abnormalities and have the potential for intelligence and / or special talents to attend education or learning in an educational environment together with students in general".*

The implementation of inclusive education in Indonesia began in 1998 - 2001 through various trials in several areas in Yogyakarta. However, its implementation up till now, especially the establishment of inclusive schools still cannot meet the needs of students with special needs. Although the latest data from Ministry of Education and Culture is not yet available on the number of inclusive schools in

Indonesia, according to the Ministry of Education and Culture of the Republic of Indonesia (2011), the number of inclusive schools in 2008 was 814 units to serve 15,181 the number of students with special needs. In 2012, the number of children with special needs was 9.9 million children and in 2017, the number of inclusive schools was 23,195 units (http://www.kemendikbud.go.id). This condition is still very far from the prevalence of the number of students with special needs who should receive inclusive education services.

The small number of inclusive schools in Indonesia is due to the fulfillment of the requirements related to the mechanism for the establishment of inclusive schools that have been established by the government, as well as being obstacles that have been faced by public schools - public and private elementary schools - which are expected to be converted into inclusive primary schools. The requirements and mechanisms that have been set by the government related to the implementation of inclusive schools are: (1) school readiness to organize inclusive education programs (principals, school committees, teachers, students and parents) (2) there are special needs students (SNS) in the school environment (3) availability of special assistant teachers (SAT) (4) completion commitment of compulsory education (5) establish cooperation with other relevant institutions (6) available supporting facilities that can be accessed by all students (7) schools have received socialization about inclusive education (8) fulfill all administrative procedures that have been determined by each region (Kemendikbud, 2011). Some obstacles that have been faced by schools in the implementation of inclusive schools are the people's understanding of inclusive education that is still lacking, the teacher's understanding of the characteristics of students with special needs, supporting facilities, curriculum and learning systems that must be designed by teachers in inclusive classes (Rudiyati, 2011).

The purpose of this study was to explore the perceptions of state elementary school teachers on the level of readiness for the formation of inclusive schools, as well as the factors that constrained public elementary schools in the formation of inclusive elementary schools.

Method

This study used a quantitative approach with survey methods with the type of research included in descriptive research. The aim was to explore the perceptions of elementary school teachers to obtain exploratory data on the readiness of state elementary schools and the factors that constrain public elementary schools to become inclusive elementary schools. This study involved 115 public elementary school teachers in the area of Bogor City and Bogor Regency, West Java Indonesia as respondents. The selection of research respondents was done by random multistage cluster technique that can be used with a very large population. The criteria for public elementary school teachers selected and involved in this study were teachers who have served in one public elementary school for five years or more, and from public elementary schools that have not become inclusive elementary schools. Timing for five years or more was chosen by the researchers because they are considered as teachers can provide an assessment of public elementary school readiness to become an inclusive elementary school and the obstacles that occur in the formation of inclusive schools. Table 1 shows the demographic distribution of the participants.

Table 1. Demographic data of the participants

No	School	Gender		Time of Work (Years)					Total respondents in 1 school (people)
		L	P	5	6-10	11-15	16-20	21-30	
	School 1	3	10	2	6	3	2	0	13
	School 2	5	8	1	4	7	1	0	13
	School 3	2	5	2	2	0	1	2	7
	School 4	3	8	2	5	1	2	1	11
11.	School 5	4	6	1	4	4	1	0	10
	School 6	2	8	2	5	2	0	1	10
	School 7	1	11	4	2	3	2	1	12
	School 8	2	9	2	5	3	1	0	11
	School 9	2	6	3	1	2	2	0	8
	School 10	2	10	2	3	5	1	1	12
	School 11	1	7	1	4	2	0	1	8
		27	88	22	41	32	13	7	115

Total of respondents

1.
2.
3.
4.
5.
6.
7.
8.
9.
10.

For data collection a questionnaire method was used that has been validated by experts in the field of inclusive education.

The questionnaire provided consisted of 7 items, with a form of questions related to school readiness and factors related to constraints faced by public elementary schools to become inclusive elementary schools. Respondents are expected to be able to answer each research question and provide reasons according to respondents' perceptions of the facts about readiness and the factors faced in changing the public elementary school into an inclusive elementary school. After the data is collected, the respondent's answer will be re-validated by the expert, so that the validity of the data can truly be accounted for. Furthermore, to facilitate data analysis, questionnaire data was made coding by identifying and classifying them according to certain categories. Data analysis was carried out with descriptive quantitative analysis in the form of percentages in each category.

Results

After going through the results of coding and interpretation of the data that has been collected, the following results are obtained:

Public elementary school readiness to turn into public inclusive elementary school

The results of the study found in 115 respondents on the readiness of each school – public elementary school - to turn into inclusive elementary school consist of 3 categories, namely: ready, not ready and unprepared. Table 2 is the results of readiness and the percentage of each respondent's perception of public elementary school readiness to be inclusive elementary school.

Table 2. Preparedness of Public Elementary Schools to Become Public Inclusive Elementary Schools

No	Level of readiness	Number of respondents	Persentage
1.	Ready	23	20%
2.	Not ready	57	49.60 %
3.	Unprepared	35	30.40%

In Table 2, it can be stated that as many as 57 respondents or 49.60% are not ready to make their schools become inclusive elementary schools.

Factors That Become Constraints in the Formation of Public Elementary Schools Become Public Inclusive Elementary Schools

The results found in the factors that constrain the formation of public elementary schools into inclusive elementary schools are shown in Table 3:

Table 3. Factors That Become Constraints in Amount of Respondents

No	Factors That Become Constraints in Amount of Respondents	Amount of respondents	Persentage
1.	Availability of facilities and infrastructure	28	24.35%
2.	Teacher skills	27	23.48%
3.	Willingness of SAT	23	20.00%
4.	Mind the set of parents and society about inclusive education	17	14.78%
5.	Fund availability	11	9.57%
6.	Government involvement	9	7.82%

In Table 3, there are six factors that are constraints in the formation of public elementary schools to be elementary inclusive, with the biggest factors being constraints are the availability of facilities and infrastructure, namely 28 respondents or 24.35%. Another factor that is almost the same as the biggest obstacle is the factor of increasing teacher skills, namely as many as 27 respondents or 23.48% of the total respondents.

Discussion

The readiness level of public elementary schools to become public inclusive elementary school
The level of school readiness is an important aspect in the implementation of inclusive education. Without adequate school readiness, efforts to succeed in implementing education and educational goals are difficult to achieve. The results of this study show three levels of public elementary school readiness to be formed into inclusive elementary schools. Perceptions generated by teachers at this level of readiness are shown at the most dominant level that public elementary schools are not ready to implement inclusive education.

Understanding that is not ready, which is perceived by elementary school teachers, is related to the obstacles faced, including the facilities and infrastructure owned by the school in carrying out inclusive education. Some teachers who stated that they were not ready to be included in the school actually had infrastructure such as the availability of friendly toilets with children with special needs, counseling rooms, having students with special needs but who did not have special tutors who helped class teachers, limited financial / funding skills , has received socialization in the form of a seminar from the government on inclusive education - once to twice - but it still has to be fostered especially the strengthening of the curriculum and inclusive classroom learning, some teachers do not have the ability to identify or assess students with special needs. Some of the teacher's statements about the unpreparedness of public elementary schools to become inclusive elementary schools are illustrated in one of the following elementary school teacher statements:

> *"... if seen as a whole, our school is not ready to run inclusive schools, because there are many shortcomings that still need to be met, such as facilities for children with special needs, even though our school has accommodated students with special needs such as students with learning difficulties. It is very difficult to handle them if the teacher does not know his knowledge. We also need assistant teachers who can help, but our school does not have it yet "*(School teacher 2).

At the level of readiness not prepared according to the teacher's perception is the readiness of schools that do not have the ability to organize inclusive education. Schools do not have adequate facilities and infrastructure, such as not having a counseling room, limited number of child-friendly toilets, schools have never received socialization or teachers have never received seminars on inclusive education, do not have special mentoring teachers, have special needs students but teachers have not been able to handle it, do not have sufficient funding to organize inclusive education. Some teacher statements that show that schools are not ready for the formation of inclusive schools as below:

> *"... our school is not ready if it now has to be an inclusive school, many of which must be met first. Especially the infrastructure facilities, funds, skills of teachers are still many who do not understand about inclusive education. We have never received training on inclusive education, only from friends. Even though there are some children with special needs in our school, just because we don't know how to handle it, so just leave it like other students ... "*(School teacher 4).

The level of preparedness is the perception of teachers who are schools that have the ability to organize inclusive schools. Schools have adequate facilities and infrastructure, such as toilets that are friendly to students with disabilities, have special tutor teachers even though the numbers are limited, have funds to run inclusive schools including funds from parents to buy special tutors, teachers have received several times socialization or training on inclusive education, has worked with special schools in dealing with students with special needs, in collaboration with psychologists to conduct identification and assessment, the teacher has been able to handle students with special needs. This readiness is shown by one of the teachers in the statement below:

> *"... our school is ready to carry out inclusive education, because all this time our school has been appointed several times for training in inclusive education by the Bogor City education office. I have handled a number of students with special needs with the help of an special*

school teacher, so I understand how to handle these students. I also hope that the government can continue to build schools, so that if later it becomes an inclusion model school we can help other schools in organizing inclusive schools ... "(School teacher 9).

School readiness is very necessary in forming or organizing inclusive schools. It is not easy to prepare a school especially a public school to become an inclusive school. All stakeholders such as principals, school committees, parents, teachers, students and the community must be together

Factors that become obstacles in the formation of public elementary schools are elementary inclusive
Factors that become constraints in the formation of public elementary schools to become inclusive elementary schools are factors that are related to the problems faced by schools in organizing inclusive education. Teacher's perception of these factors consists of six parts sorted from the biggest to the smallest constraints.

Availability of facilities and infrastructure
Availability of facilities and infrastructure in inclusive schools related to the use of facilities, equipment - moving and immovable - as well as supporting media - which are used in the learning process and can be accessed by all students, especially students with special needs who need help so that learning objectives can be achieved effective and efficient. Some obstacles faced by schools such as limited funds to buy equipment needed by students with special needs for the blind, or autistic students who need special media such as special computers (Tsolakidis & Tsattalios, 2014), or special seat equipment for double-tuna students who do not have a school . Not infrequently schools seek additional funds or borrow equipment from special schools, so learning can take place and can meet the needs of students with special needs. Some perceptions or reasons given by the teacher regarding the provision of facilities and infrastructure are shown in the statement below:

> *"I once taught a child whose limbs are incomplete (his legs are not perfect). Our school does not want to accept, but we are sorry because the child is actually smart. So we accepted the child and borrowed a wheelchair in the special school because his parents did not have enough money to buy a wheelchair "*(School teacher 5)

The availability of facilities and infrastructure is an absolute requirement needed in the implementation of inclusive education. The purpose of providing facilities and infrastructure is to help achieve student achievement (Uline & Tschannen-Moran, 2008) so that the fulfillment of student learning needs and help students mobility become easier.

Teacher skills
The success of the implementation of inclusive education is largely determined by the competence of teachers in designing learning which consists of various characteristics, diversity, weaknesses and strengths of all students, including students with special needs. The ease of the teacher in designing learning is not only because of the interaction of learning with students, but also can embrace and cooperate with parents, community, school committees in planning, implementing and evaluating learning in schools. Some perceptions and reasons raised by teachers related to teacher competencies in inclusive classes are as follows:

"I only attended seminars on inclusive education once, so I still don't understand how to make lesson plans, especially for SNSs. I also do not understand how to know what a student has a disability, except as blind or deaf can be known. But if you are an autistic or other child, you still need to learn from experts "(School teacher 6)

The constraints faced by primary school teachers in inclusive classes are the difficulty of designing learning that can meet the needs of all students. This difficulty is related to the teacher's lack of understanding of the characteristics of all students, including SNS, so that it is difficult to handle SNSs if they are experiencing problems in the learning process. Another difficulty is that teachers do not understand how to design individual learning programs for SNS, which is a guide for teachers to be able to improve the academic and social achievements of SNS.

The task of teachers in inclusive classes is expected to collaborate on a team to meet the needs of all students (Ricci, Zetlin, & Osipova, 2017) including students with special needs, such as collaborating with the accompanying teacher to understand responsibilities, tasks, procedures, school policies, building communication good, evaluating learning and implications of students with special needs (Basak Baglama, Yikmis, & Demirok, 2017). Another important thing is that teachers must understand and be able to adjust learning objectives, design flexible learning for all students using learning strategies that can accommodate all students (Halliwell, 2012).

Availability of SAT

Based on the guidelines for the implementation of inclusive education of the Ministry of Education and Culture of the Republic of Indonesia (2011), it is stated that SAT are teachers who have the competence of at least undergraduated level of special education faculty or who have competence in special education, with mutual duties collaborate with teachers and other education personnel, as well as the community in carrying out learning. Another task is to work together with classroom teachers and subject teachers to develop academic and non-academic assessment instruments, SNS' individual learning programs, additional services for SNS, as well as providing assistance, special services, and special learning to SNS. The SAT facilitate the learning process with SNS (Uzair-ul-Hassan, Hussain, Parveen, & De Souza, 2015), and are expected to be able to apply their skills and knowledge to ABK students (Roberts & Guerra, 2017).

Some of the constraints faced by schools in the provision of special tutors are that it is difficult to find SATs who have competencies that are appropriate to the needs of students, because most SATs have more duties and teaches in special education school. So it is not uncommon, although public schools that are not inclusive schools, and have SNS do not have SAT and are only served by classroom teachers or subject teachers with modest services (Keefe & Moore, 2004). This perspective is explained by the teacher in the opinion below:

"It is very difficult to be able to teach in a class that has children with SNS (2 children learning difficulties) and with the number of students I have almost 40 people. I can't focus and pay attention to SNS because they have to teach other students too. Because our school does not have SAT who can help me, so I equate the learning with other students "(School teacher 10).

Another obstacle is that schools do not have special funds to pay the honorarium or salaries of SATs,

even though in the government regulation No. 70 of 2009 Article 10 paragraph states that the government and the provincial government assist and provide special counselors for education units in the implementation of inclusive education. In fact, the provision of SAT must still be provided by the school as well as the funding. To charge SATs fees or salaries to parents, most parents who have SNSs come from underprivileged categories, so that indirectly, class teachers or subject teachers must handle SNS the same as other non-SNS students. Another opinion is explained by the teacher below:

> *"Schools do not have SAT because schools do not have enough funds to finance them. If you charge it to parents, most parents whose children include children with SNS come from underprivileged parents. So sometimes we ask parents to help their children in class when studying "*(School teacher 7)

Even though class teachers or subject teachers do not have specific skills and competencies regarding the handling of SNSs. This condition has caused public elementary schools that will become elementary schools not to have SATs who indirectly have to accept and handle SNSs (Mapunda, Omollo, & Bali, 2017).

Parents' and Society's Mind-Set or the thinking towards inclusive education
One of the obstacles that has become less successful in the implementation of inclusive education both schools that have carried out inclusive education and are just going to implement inclusive education is the mindset of parents and the community towards inclusive education. Some of the thoughts of parents and society that lead to the pros and cons of inclusive education are some parents who think that teachers have difficulty dividing their time and attention if in an inclusive class there are SNSs, so the time and attention for other non- SNSs will be confiscated only for SNSs. Parents are also worried about the occurrence of bullying committed to SNSs (Rose et al., 2015). Parents also think that it is better for SNSs to go to school in special education school, so that students get a sense of security and comfort to learn together with other SNSs. But some parents and the community also think that if SNSs study together with other non-SNSs in inclusive schools, then this is the right school so that SNSs can socialize, and not close themselves with their peers or be more constructive (Francis, Hill, Blue-Banning, Turnbull, & Haines, 2016). Teacher's perception of parents' and community's thinking about inclusive education is stated below:

> *"Many parents do not understand about inclusive education. They are worried that if there are children with SNS who go to school, the teachers cannot get their focus and attention divided because they have to deal with SNS. Parents also recommend that SNS children should go to school in the special education school alone, so that they are not bullied by other children. But in my opinion, it is very important that children with SNS go to inclusive schools so that they can socialize well with their friends who do not have special needs "*(School teacher 11)

The pro and contra conditions that occur to parents and the community about inclusive education because of the lack of socialization carried out by the government and schools. Socialization is very important to be done in order to support the implementation of the implementation of inclusive education (Zvoleyko, Kalashnikova, & Klimenko, 2016). Forms of socialization can be in the form of seminars, training and joint commitments in the form of inclusive work groups that involve the community. The government together with the school must be able to embrace all parties, both

parents, communities, other organizational institutions and convince them that the goal of inclusive education is one form of service so that all children without exception have the right to education so that it is useful for every child in their time will come.

Fund availability

One of the obstacles in the implementation of inclusive education is the availability of funds that support the implementation of inclusive education. Public elementary schools that will carry out inclusive education will automatically not get operational funds from the government, so they have to think about the availability of funds themselves. During this time, although they do not have special funds to carry out inclusive education, but with the obligation of every public elementary school to be able to receive all students including students with special needs, this condition causes school services to be provided only in accordance with the availability of funds owned by the school.

Funds that must be owned by schools that will conduct inclusive education consist of funds to purchase facilities and infrastructure consisting of physical facilities (child-friendly toilets, counseling rooms) and in learning, such as learning media needed by SNSs in accordance with the obstacles of SNSs. Another very important requirement is the use of SATs payments, although some parents who have SNSs pay the SATs fees. But almost the majority of parents were unable to provide funds to pay for SATs fees. In addition, for the purpose of achieving inclusive education to be achieved, schools must identify and assess and cooperate with psychologists and neurologists in identifying categories of SNSs as well as interventions that must be carried out by teachers to SNS in accordance with the categories of SNSs. For this reason, schools also have to spend funds and fees that are usually done at the beginning of school entry to psychologists and neurologists. For public elementary schools, if the availability of funds is not sufficiently owned, then the implementation of inclusive education is very difficult to do (Kim, 2014). Teacher's perception of the availability of funds for public elementary schools is explained in the opinion of a teacher below:

> *"So far we have never received special funds to support inclusive schools. in fact we need these supporting funds, to buy equipment and equipment for SNS. Even though we are not an inclusive school, but because there are children with SNS and our obligation to accept SNS, we have to have special funds. As far as I know, the funds will go down if the school is appointed by the agency as an inclusive school "*(School teacher 11)

Meanwhile, the role of the government is actually to provide funds to schools that have indeed carried out inclusive education, both those appointed by the government and approved by the government when proposing themselves to become inclusive elementary schools. But schools that do not have special funds despite having SNSs in their schools will find it difficult to carry out inclusive education, because of limited funds. The purpose of the availability of funds in the implementation of inclusive education is that the program can take place well and smoothly, so that all students can feel the purpose of inclusive education (Mosia, 2014).

Government involvement

One of the obstacles faced by public elementary schools to become inclusive elementary schools is the lack of government involvement in meeting the requirements for the implementation of inclusive education. Some of the obstacles faced are related to other internal problems: lack of socialization or training about the inclusive education system to schools both principals, teachers and other education

personnel, so that understanding of inclusive education is holistic is lacking. In fact, although not yet as an inclusive elementary school, there are students with special needs who must be able to be served and handled according to their needs.

In addition to socialization, teacher skills are rarely improved regularly. Especially in the learning system that involves the curriculum, the learning process starts from the planning, implementation and evaluation stages that teachers really need as indicators of the success of inclusive schools. During this time, the teacher only understands the learning system by self-taught, lacking the direction from the relevant agencies so that the handling of SNSs becomes less optimal. Perceptions of government involvement in the implementation of inclusive education are found in the following teacher's opinion:

> *"The government, especially the education office, is very lacking in involving teachers for continuous training. Within a year, only once did I take part in the training, and even then it wasn't too deep. The education office should conduct training through work clusters in detail and routinely, so that we understand thoroughly about inclusive education, even though our school has not yet become an inclusive school "*(School teacher 10)

The government, in this case the education office does not provide and assist the availability of SAT who can help class teachers or subject teachers in handling SATs. So far the school has been looking for the availability of SATs, with less competence in accordance with the requirements set by the government. The lack of school funds to pay for honorariums or funding for SATs has made it difficult for schools to provide SATs. Although some schools work with parents in providing SATs, not all of these conditions apply to all schools, because most parents are in the middle to lower condition.

The provision of supporting facilities and infrastructure for the implementation of learning and physical facilities that are child friendly, is also still lacking by the government. For example, learning media needed by SNSs with special disabilities such as down syndrome, or other physical disabilities are still not available in most schools. Fulfillment of learning media needed by students, in some schools borrowing from the nearest special education school so that they can serve and help SNSs in their learning. It is not uncommon for teachers to spend their own funds to make learning media for SNSs to keep learning going.

The role or involvement of government is an obligation that should be carried out continuously in order to succeed in the implementation of inclusive education (Osiname, 2017). The involvement of this government can be done starting from the process of forming an inclusive elementary school from public elementary schools that do require comprehensive government attention and involvement. Without government involvement, it is difficult for public elementary schools to turn into inclusive elementary schools which are not only focused on building learning systems, but are related to education funds that have been fully subsidized by the government. The success of the implementation of inclusive education can only be achieved by the involvement of all education stakeholders, so that all education can be felt by all students is no exception by SNSs (Priyadarshini & Thangarajathi, 2016).

Conclusion

The success of organizing inclusive education is largely determined by the readiness of the formation or establishment of inclusive schools as the initial stage to become an inclusive school. The establishment of public elementary schools to be inclusive elementary schools has experienced various obstacles that must be faced by the school, which has not received special attention from all stakeholders involved. Various teacher perceptions related to the formation of public elementary schools to become inclusive elementary schools indicate that as many as 49.60% of public elementary schools are not ready to become inclusive elementary schools, as many as 30.40% are not ready to become inclusive elementary schools and as much as 20% are ready to become inclusive elementary schools. Some of the factors that are constraints in the formation of public elementary schools to become inclusive elementary schools include (1) the availability of supporting infrastructure that is still not widely owned by public elementary schools (2) teachers' skills in designing effective learning systems and handling SNSs still do not show adequate quality as one of the important conditions in the implementation of inclusive education (3) the unavailability of SATs in every public elementary school because it is related to the provision of funds to pay for SATs, and at least SATs who do have the competence as SATs set by the government (4) mind set or the thinking of parents and communities who do not understand the meaning and benefits of inclusive education, so it tends to be difficult to accept the inclusive education system as a system that serves all the characteristics, weaknesses, strengths and obstacles of all children (5) public elementary schools do not have enough funds to change become an inclusive elementary school, before getting the government's appearance as an public elementary inclusive model, although in its implementation that most of the students received SATs to study together with other non-SATs, which inevitably requires the same attention and service as public inclusive elementary school(6) there is still a lack of involvement of government or related agencies in supporting Public elementary schools become inclusive elementary schools, in terms of socialization to parents and the community, improvement of teacher competencies, provision of school facilities and infrastructure and learning, provision of SATs, and provision of funds in the establishment of inclusive elementary schools.

References:
Basak Baglama, Yikmis, A., & Demirok, M. S. (2017). Special Education Teachers' Views On Using Technology In Teaching Mathematics. https://doi.org/10.5281/zenodo.839032

Curcic, S., Gabel, S., Zeitlin, V., Cribaro-DiFatta, S., & Glarner, C. (2011). Policy and challenges of building schools as inclusive communities. *International Journal of Inclusive Education*, *15*(1), 117–133. https://doi.org/10.1080/13603116.2010.496206
Francis, G. L., Hill, C., Blue-Banning, M., Turnbull, A. P., & Haines, S. J. (2016). Culture in inclusive schools: Parental perspectives on trusting family-professional partnerships. *Education and Training in Autism and Developmental Disabilities*, *51*(3), 281.
Gous, J. G., Eloff, I., & Moen, M. C. (2014). How inclusive education is understood by principals of independent schools. *International Journal of Inclusive Education*, *18*(5), 535–552. https://doi.org/10.1080/13603116.2013.802024
Graham, L., & Harwood, V. (2011). Developing capabilities for social inclusion: engaging diversity through inclusive school communities. *International Journal of Inclusive Education*, *15*(1), 135–152. https://doi.org/10.1080/13603116.2010.496208

Halliwell, M. (2012). *Supporting children with special educational needs: A guide for assistants in schools and pre-schools*. Routledge.

Hardy, I., & Woodcock, S. (2015). Inclusive education policies: discourses of difference, diversity and deficit. *International Journal of Inclusive Education*, *19*(2), 141–164. https://doi.org/10.1080/13603116.2014.908965

Jelas, Z. M., & Mohd Ali, M. (2014). Inclusive education in Malaysia: policy and practice. *International Journal of Inclusive Education*, *18*(10), 991–1003. https://doi.org/10.1080/13603116.2012.693398

Keefe, E. B., & Moore, V. (2004). The challenge of co-teaching in inclusive classrooms at the high school level: What the teachers told us. *American Secondary Education*, 77–88.

Kementerian Pendidikan Dan Kebudayaan (2011). Pedoman Umum Penyelenggaraan Pendidikan Inklusif.

Kim, Y.-W. (2014). Inclusive education in South Korea. *International Journal of Inclusive Education*, *18*(10), 979–990.

Mapunda, P. H., Omollo, A. D., & Bali, T. A. L. (2017). Challenges in identifying and serving students with special needs in Dodoma, Tanzania. *International Journal of Child Care and Education Policy*, *11*(1). https://doi.org/10.1186/s40723-017-0036-8

Mosia, P. A. (2014). Threats to inclusive education in Lesotho: An overview of policy and implementation challenges. *Africa Education Review*, *11*(3), 292–310.

Osiname, A. T. (2017). Utilizing the Critical Inclusive Praxis: The voyage of five selected school principals in building inclusive school cultures. *Improving Schools*, 1365480217717529.

Peraturan Menteri Pendidikan Nasional Republik IndonesiaNomor 70 Tahun 2009.

Priyadarshini, S. S., & Thangarajathi, S. (2016). Effect of Selected Variables on Regular School Teachers Attitude towards Inclusive Education. *Journal on Educational Psychology*, *10*(3).

Ricci, L. A., Zetlin, A., & Osipova, A. V. (2017). Preservice special educators' perceptions of collaboration and co-teaching during university fieldwork: implications for personnel preparation. *Teacher Development*, *21*(5), 687–703.

Roberts, M. B., & Guerra, F. R. (2017). Principals Perceptions of their Knowledge in Special Education. *Current Issues in Education*, *20*(1).

Robo, M. (2014). Social inclusion and inclusive education.

Rose, C. A., Stormont, M., Wang, Z., Simpson, C. G., Preast, J. L., & Green, A. L. (2015). Bullying and students with disabilities: examination of disability status and educational placement. *School Psychology Review*, *44*(4), 425–444.

Rudiyati, S. (2011). Potret Sekolah Inklusif di Indonesia. In *Makalah Seminar Umum AKESWARI*.

Tsolakidis, C., & Tsattalios, N. (2014). DIGITAL VIDEO TECHNOLOGY AS A TOOL FOR TEACHING AND LEARNING. *Journal of Educational & Instructional Studies in the World*, *4*(4).

Uline, C., & Tschannen-Moran, M. (2008). The walls speak: the interplay of quality facilities, school climate, and student achievement. *Journal of Educational Administration*, *46*(1), 55–73. https://doi.org/10.1108/09578230810849817

UNESCO Bangkok. (2005). *Embracing Diversity: toolkit for creating inclusive, learning-friendly environments*. Bangkok: UNESCO.

United Nations Education, Scientific and Cultural Organisation. (1994). WORLD CONFERENCE ON SPECIAL NEEDS EDUCATION: ACCESS AND QUALITY. UNESCO.

United Nations Education, Scientific and Cultural Organisation. (2017). A guide for ensuring inclusion and equity in education. UNESCO.

Uzair-ul-HASSAN, M., HUSSAIN, M., PARVEEN, I., & DE SOUZA, J. (2015). EXPLORING TEACHERS'EXPERIENCES AND PRACTICES IN INCLUSIVE CLASSROOMS OF MODEL SCHOOLS. *Journal of Theory and Practice in Education*, *11*(3), 894–915.

Winter, E., & O'Raw, P. (2010). Literature review of the principles and practices relating to inclusive education for children with special educational needs. *National Council for Special Education. Trim, Northern Ireland*.

Zvoleyko, E. V., Kalashnikova, S. A., & Klimenko, T. K. (2016). Socialization of Students with Disabilities in an Inclusive Educational Environment. *International Journal of Environmental and Science Education*, *11*(14), 6469–6481.

A Model for Classroom-Based Intervention for Children with Sensory Processing Differences

Gwen Wild, MOT, OTR/L,

gwen@sensationalbrain.com

Sherry L. Steeley,

(slsteeley@gmail.com)

Abstract

This study examines the impact of a general education classroom-based sensory program for students exhibiting sensory processing differences in the school environment. Students were divided by age and degree of sensory needs between control and experimental groups, with teachers of students in the experimental group implementing the recommended sensory program (BrainWorks) with all students in the classroom. In spite of the top-down nature of the training for teachers, which generated a skeptical and in some cases resistant teacher population in both groups, results demonstrated a positive impact, although the degree of magnitude differed across classrooms and age groups. Of equal significance is the difference in teacher implementation structures, which provides input for future training approaches. The degree of change in classroom performance of students in the experimental group suggests that training for teachers with students who have sensory differences is effective and that students can benefit from a classroom-based sensory program as an investment in classroom performance. The significance of this study is that it goes beyond the therapeutic environment, where sensory processing is more commonly measured, and evaluates actual classroom-level/educational setting impact, with concrete implications for effective classroom interventions. Future research in this area could expand to evaluate actual academic gains as measured by standardized academic scores,

furthering the data in this study which evaluated performance on standardized sensory and behavioral measures.

Introduction and Rationale

Sensory Processing Disorder (SPD) is a condition that impairs an individual's ability to organize input from sensory sources and react according to that input (Alibrandi, Beacock, Church, Des Moines, Goodrich, Harris, Sprague, & Vrtovsnik, 2014; Murray, et al, 2009). SPD can take the form of Sensory Modulation Disorder, which is associated with under- or over-responsiveness to sensory input such as touch, movement, or other sensations; Sensory-Based Motor Disorder, involving difficulty organizing and sequencing tasks related to physical movement; or Sensory Discrimination Disorder, which limits the ability to distinguish among visual, movement, auditory, tactile, and other sensory input (Alibrandi et al, 2014; Murray, Baker, Murray-Slutsky, & Paris, 2009). SPD often coincides with autism spectrum, attention deficit, behavior, anxiety, or attachment disorders (Sensory Processing Institute for Research and Learning, 2006). Although SPD is not included in the DSM-V, these sensory integration issues create challenges in academic and daily living settings and can be treated through regular therapies and sensory integration programs (Sensory Processing Disorder Foundation, 2014).

Studies on the impact of clinically-based therapy, the use of sensory strategies, and movement breaks provide a rationale for developing the capacity for teachers to provide a classroom-based intervention for students with SPD. This study investigates the impact of a program that involves training teachers in the implementation of sensory strategies and movement breaks as reflected in student gains in sensory processing and behavioral measures. While particular to an individual school, the impact of these measures in a short-term program reinforces other studies reflecting similar benefits (e.g. Worthen, 2010). It is the hope of researchers that this study can contribute to increasing work in this area so that students impacted by sensory processing challenges can improve their academic focus, learning, and behaviors that will support their growth and achievement of their potential as students and community members.

Review of Research

According to the Sensory Processing Institute for Research and Learning (2006), between 5-13% of students enter school with sensory processing disorder. This disorder can involve behaviors that directly impact classroom performance socially and academically. Aspy & Grossman (2007) note that behaviors resulting from SPD impede social and cognitive function on many levels, which in turn impairs classroom performance and learning. Children with SPD often suffer inconsistent attention and arousal, behaviors involving movement or self-stimulation, impairments in communicative responses, and difficulties with daily routines or social interactions (Pfeiffer, Koenig, K., Kinnealey, M., Sheppard, M., & Henderson, 2011; Schoen, Miller, & Sullivan, 2015; Worthen, 2010).

Sensory-seeking behaviors may involve jostling, pushing, misusing materials, inappropriate movement or touching, and other behaviors perceived as disruptive; sensory avoiders may have difficulty with noise, lines, and various activities in the classroom or school setting. Sensory dysregulation can lead to attentional difficulties, distractibility, difficulty processing multi-step directions, and challenges with managing transitions. Sensory dysregulation can interfere

enormously with academic performance, learning, and social participation, limiting the prospects for successful school experiences (Alibrandi et al, 2014; Aspy & Grossman, 2007; Reebye & Stalker, 2008; Sensory Processing Institute for Research and Learning, 2006).

Research on SPD Interventions in Therapeutic Settings

Historically, Aspy & Grossman (2007) note, there is a great deal more practice in the field of therapy for SPD than research. Of the research that exists, there is much more related to clinical impact than classroom; some of this research demonstrates the effectiveness of sensory integration therapies and sensory strategies.

The Sensory Processing Disorder Foundation (2014) shows the impact of an intensive short-term intervention conducted in a clinical setting with parental support where over the course of 30 sessions, 98 children demonstrated gains well above the expected level. A study by Pfeiffer et al (2011) showed gains in social responsiveness and self-regulation through a sensory processing program for a group of 6-12 year olds receiving 18 therapeutic sessions over a 6-week period in a summer program. A study by Miller et al (2007) found significant results in attentional and internalizing functions as the result of a 10-week intervention with 24 children with various disabilities and sensory processing challenges with the average age of 6.

Research on School-based SPD Interventions

Most of this research has been undertaken without direct linkages to classroom performance. A few studies, however, have looked directly at teacher use of sensory integration methods to improve academic performance, and there is a growing realization that the classroom is the most natural setting to evaluate the impact of sensory interventions (Worthen, 2010). In 2001, Keller examined the impact of using sensory integration strategies to improve handwriting. Her approach combined gross motor activities as a warm up, fine motor warm up activities, followed by direct instruction in letter writing, guided practice, semi-independent, teacher-guided practice, and then independent practice. Her findings, conducted in a single setting, found that student learning objectives were met; additionally, student awareness of using sensory strategies to self-regulate also developed.

A study of the impact of providing sensory input during work at desks found that participation and on-task activity improved significantly (Schilling & Schwartz, 2004, cited in Aspy & Grossman, 2007). In a school-based study, Parham (1990) found that a long -term intervention had the greatest impact on the academic functioning of children 6-8 years old, notably in the area of math; the impact of the intervention diminished as children grew older.

In a review of recent research on the impact of sensory interventions on classroom behavior, Worthen (2010) found that there was in fact a positive impact in numerous research studies focused on preschool through elementary-aged students, both those with and without developmental differences or disabilities. Among key findings was that the use of auditory input such as calming music to enhance work efficiency, alternative seating devices and postures for improving attention, tactile stimulation and pressure to reduce off-task behaviors, and other interventions produced positive outcomes for groups of students in the studies reviewed. As a result, Worthen (2010) recommends that school-based OTs develop programs with sensory

strategies for use in general education classrooms to improve behavior and attention and promote academic achievement.

Several studies have examined the effectiveness of teaching self-regulation strategies to students and have noted positive results. A study of pre-school children found that self-regulation serves to mediate classroom skills, and that curricula that incorporate teaching of strategies for self-regulation can have a positive impact on student behavioral, social, and academic performance (Raver, Li-Grining, Bub, Jones, Zhai, & Pressler, 2011). Shanker (2013) describes interventions to promote self-regulation that is critical to higher order and metacognitive thinking in the classroom. Another study on the classroom impact of self-regulation found that when students are dysregulated, their attention shifts to a search for a return to regulation, withholding attention from the learning task (Boekaerts & Corno, 2005). Often the use of coping mechanisms can be "bottom up" – i.e. used to cope with challenging external stimuli rather than top-down –an attempt to prepare for learning (Boekaerts & Corno, 2005, p. 204). Boekaerts & Corno (2005) further point out that all students face stressors, but that students with sensory differences face chronic internal and external stressors that undermine the path to learning goals (p.204). Teaching coping mechanisms is essential for ongoing self-regulation socially and academically (p.204) because when students have access and the will to use regulation strategies, they can maintain a focus on goals (p. 206). Direct teaching of the use of strategies – an inherent part of this study's intervention – can be an important step for students' progress toward their own approach to self-regulation.

In addition to direct sensory processing interventions, there is an emerging body of research on the value of movement breaks for students in school, not merely those with SPD (e.g., Jensen, 2000; Mulrine, Prater, & Jenkins, 2008; Swinth, 2015). Movement provides stimulus to the brain, increases levels of neurotransmitters that improve mood and focus, allows for processing time, and provides a break from learning that in turn allows students to refocus. Effective movement breaks can include those that vary posture and access to material during learning as well as breaks for stretching, walking, and other exercise (Jensen, 2000). Many researchers believe that movement is essential to optimize learning and achievement, and can support attentional gains and behavioral improvement (e.g., Mulrine, et al).   Incorporation of movement is an important aspect of this study's intervention.

Teacher Knowledge

In spite of the emerging body of research regarding the benefits of sensory strategies and movement breaks in the classroom, provision of school-based services for sensory processing is still largely dependent on the district, or even the school-based OT, who has discretion over the type of OT services provided (Morris, 2007). Moreover, some research has shown that teachers have little understanding of sensory processing disorder or the implementation of sensory strategies. Alibrandi et al (2014) report that while 87% of Head Start staff claimed familiarity of SPD, only 17% could provide an accurate definition; similarly, 53% reported knowledge of sensory diets, but only 10% could define them.   When sensory processing disorder is misunderstood, teachers may misinterpret sensory-seeking or sensory-avoiding behaviors as problematic behaviors the child can control and attempt to eliminate them (Aspy & Grossman, 2007; Murray et al, 2009). In such cases, where the underlying state of dysregulation remains unaddressed, students may seek alternative behaviors, and learning and social integration will be undermined. Even among those with an understanding of sensory processing needs of children,

the fact that sensory input is ongoing and cumulative may lead to misunderstanding of areas of difficulty (Aspy & Grossman, 2007).

If educational approaches are to succeed for students with SPD, teacher instruction regarding movement breaks and the use of sensory strategies to enhance sensory modulation will be necessary to enable these children to attend and maintain focus on instruction in their educational environment (Aspy & Grossman, 2007; Murray et al, 2009). Recognizing the importance of meeting sensory needs as a precondition for effective instruction, Aspy & Grossman (2007) include the sensory domain in their comprehensive model for instructional programming. Thus, consideration of this domain is critical, both in terms of managing the environment, and developing proactive sensory interventions so that a child can maintain regulation. Finally, Murray et al (2009) note that just providing sensory input is not enough; students need to learn strategies to meet their own needs, maintain a state of regulation, and develop alternative behaviors.

Context of this study

It is upon this foundation – the emerging research on the classroom impact of movement breaks, sensory strategies, student instruction in self-regulation, and the need for greater teacher information in order to effectively implement such interventions – that this study examines the efficacy of a classroom-based program (henceforth referred to as the "BrainWorks Program") for children with sensory processing challenges. Based on a short OT-provided training program for teachers and subsequent teacher implementation of interventions for students with sensory challenges, the study examines sensory and behavioral improvements in classroom settings. Research questions guiding the study include the following:

Research Question 1. How does a classroom-based sensory modulation program impact sensory and behavioral measures for children with sensory processing differences, based on pre- and post-evaluations with the *Sensory Processing Measure* (SPM) and the *Behavioral Assessment System for Children* (BASC-2) (Ecker, 2010; Parham, 2007; Reynolds & Kamphaus, 2004).?

Research Question 2. What factors in teacher implementation impact the results? What other aspects of program implementation may impact outcomes?

Methodology Setting

This study took place in a rural district which includes 48.7 percent economically disadvantaged students in the Elementary-Middle School grades, the focus of this study (XXX ISD, 2013). The combined elementary and middle school has a total of 261 students, with good attendance rates, parent involvement, and standardized achievement rates across demographic groups. Overall achievement rates for NCLB reporting purposes meet the state's benchmarks for proficiency. In terms of third grade reading scores, for example, the district scores were 4% higher than statewide levels in 2010-2011. Among Hispanic students, scores lagged by 7%, with subgroup data unavailable for other ethnic groups or students in special education. Results were similar in math, and throughout other grade levels reported (4th-6th); 6th grade reporting for special education students indicated a large lead in this district over statewide numbers; overall,

the district is meeting benchmarks for Adequate Yearly Progress as defined by the state (ISD NCLB Report Card, 2012). Also, according to this reporting, in 2010-2011, 94.9 percent of teacher's held a Bachelor's degree and 5.1 held a Master's degree; the previous year, the numbers were 82.7 and 17.3 respectively, likely reflecting either teacher turnover or statistical corrections.

Participants

Students were selected from classes where teachers undertook the training and subsequently implemented the BrainWorks program (the experimental group) and classes where teachers did not implement interventions (the control group). Researchers selected one teacher from each grade to be in the experimental group (with the exception of fifth grade, in which no students qualified for the study), based on balancing the number of students in the control and experimental groups. Students were divided into the control and experimental groups for equivalent numbers within the groupings of pre-kindergarten through second grade and third through sixth grades. Groups were also fairly balanced based on severity of sensory differences as measured by the SPM and the BASC-2. Overall, there were 24 students in the control group and 22 in the experimental. Teachers in both groups identified students with symptoms of sensory modulation disorder, which was covered in a staff training session.

As noted, these students were divided into control and experimental groups, with divisions occurring to deliberately balance the groups based on age and scores on the SPM and BASC-2. Table 1 presents participant assignment based on grade and pre-intervention scores on the SPM and BASC-2.

Table 1. Distribution by Grade Level and Pre-Intervention Measures

	Control Group			Experimental Group		
Grades:	N =	SPM	BASC 2	N	SPM	BASC 2
PK-2	11	61.7	53.07	14	66.23	56.47
3-6	13	58.71	53.02	8	56.13	50.71

Intervention: Training and Implementation

Teachers with students in the experimental group participated in the initial training and received on-going instruction and support from the OT Researcher over the course of the 10 weeks. This included all teachers from second grade through sixth because students move among teachers starting in second grade, and teachers would therefore implement interventions for those students in the experimental group when they were in their classrooms. For students in grades 2-6, it was the homeroom teacher who completed the assessments for the students included in this study.

The intervention was designed and implemented by a licensed Occupational Therapist (referred to henceforth as OT researcher), using the BrainWorks program. After her on-site training, she maintained at least weekly contact with teachers for support as they implemented the sensory program. There was also an on-site assistant, a paraprofessional who serves in the school's motor lab (a program based on "Ready Bodies, Learning Minds"), available to check in with participating teachers and relay information to the OT researcher.

Teacher training began with an in-service conducted by the on-site research assistant in August before school started. This session focused on the signs and symptoms of sensory processing disorder and provided the teachers with a basic checklist to identify children who may have SPD. The trainer outlined the process for involvement in the study at that time as well. At the conclusion of that training session, all teachers were asked to complete an online survey to gather information on teacher's experience level, their current level of understanding of sensory processing disorder, and their previous use of sensory strategies in the classroom. All of the teachers completed the survey before students began attending school.

In the initial teacher training session, each teacher was asked to identify 2-4 students with signs and symptoms of sensory processing disorder. Parent consent-to-evaluate forms were sent home with those children. Consent was received for 50 out of 60 of the identified students. For the students with parental consent, teachers were asked to complete the SPM or SPM-P (used for students aged 5 and younger in the Pre-Kindergarten classrooms) and BASC-2 assessment forms in September after having had the children in their classes for five weeks. The on-site research assistant provided both verbal and written instructions (prepared by the OT Researcher) for the teachers regarding the guidelines for completion of the assessments. The OT Researcher scored the assessments. Four students were eliminated from the study due to scoring within the typical range on both assessments, leaving the total number of students involved in the study at 46.

On-site teacher training by the OT Researcher took place during two days in late September after the assessments were completed and group assignments (experimental and control) had been determined. The OT Researcher conducted a one-hour in-service training session after school on each of those two days. All teachers were required to attend the first one and only teachers who had students in the experimental group were required to attend the second session. The first training session explained the purpose of the study, covered sensory modulation, the benefits of movement breaks, and the use of BrainWorks tools for students to monitor their need for sensory strategies (using the BrainWorks Tachometer) and select appropriate strategies to enhance self-regulation (using a BrainWorks folder with picture icons for different kinds of activities related to sensory systems that are "too fast," "too slow" or "just right"). The second training session was titled "Sensory Diets in the Classroom" and covered a variety of calming, alerting, and "just right" activities that could be carried out in the classroom setting as well as a variety of sensory modifications and adaptations that could be helpful to the students in the experimental group. This training also outlined the components of the intervention program. Additionally, the OT Researcher met individually or in small groups with the teachers in the experimental group for approximately 20 minutes to go over the assessment results of each of their students and to make individualized recommendations for those students.

The BrainWorks program for students in the experimental group included the following:
- "Brain Breaks" every 15-20 minutes for students in Pre-K through Grade 2, every 30-40 minutes for grades 3-4, and every 50 minutes for grades 5-6. "Brain breaks" were defined as short opportunities (30 – 90 seconds) to move the whole body. Teachers were provided with BrainWorks Activity Cards to guide appropriate activity selection. The recommended activities were primarily proprioceptive in nature such as isometric exercises, deep pressure to the head, wall push-ups, etc. It was recommended that all "Brain Breaks" should be followed by two "belly breaths" (deep breathing that causes the abdomen to expand outwardly).

- "Sensory breaks" twice per day for students in all grades. "Sensory breaks" were defined as longer (at least 10 minutes) opportunities for movement and sensory input. Teachers were given options for sensory breaks through the use of BrainWorks Activity Cards representing activities such as yoga, classroom exercises, and movement songs as well as access to GoNoodle.com (website providing video-guided movement breaks).
- Classroom instruction in the identification of sensory needs through the BrainWorks tools. Instruction options included the book titled "Arnie and His School Tools" for the younger students, teacher instruction, a short video explanation prepared and presented by the OT Researcher, and having the class receive instruction directly from the OT Researcher via Skype. Teachers were asked to use the BrainWorks analogy and tachometer frequently throughout the duration of the study.
- The use of sensory equipment provided by the OT Researcher on an as-needed basis. Equipment included FootFidget® Footrests, Kore Wobble Stools, noise-reduction headphones, fidget toys, weighted lap pads, and therapy balls for seating.
- Modifications and adaptations per OT Researcher recommendations such as dimming the lights, playing modulating music, and preferential seating.

Recommendations by the OT Researcher for individualized sensory strategies or the use of sensory equipment were based on the OT Researcher's professional interpretation of the assessment tools as well as the use of *SPM QuickTips*, (Henry, 2007) a tool that assists clinicians in the selection of appropriate intervention strategies based on the results of the SPM.

Post-training, teachers spent 10 weeks implementing the program as outlined above and remained in contact via email and phone calls with the OT Researcher. The on-site research assistant stopped by the classrooms assigned to the experimental group regularly to observe and assure follow-through of the program components. Apparent lack of follow-through was reported to the OT Researcher and the principal. The principal communicated with the teachers regularly as well and let the OT Researcher know of potential issues with teacher follow-through. At the end of the 10 weeks, teachers completed the SPM or SPM-P and BASC-2 assessment scales for each student and completed another online teacher survey.

Data Collection and Analysis

Data collection was purposeful and thorough in order to examine various facets of the study and to elucidate variables that may impact both research results and the conduct of future studies in this area.   As a validity strategy (discussed further below), data in each category were triangulated so that greater insight and interpretive validity could be applied through transparency and reporting.

To respond to Research Question 1, the impact of the intervention on student classroom functioning, the primary data sources were the scores on pre- and post SPM or SPM-P and BASC-2 assessments for students in the control and experimental groups. Teacher feedback on the impact of the intervention was a secondary source. In order to examine research Question 2, the implementation of the sensory program and movement breaks, we examined the data from evaluations completed by teachers, teacher implementation records, and the post-implementation teacher surveys. Secondary data sources which were used to triangulate and make meaning of the primary data results were field notes from the OT conducting the training focused on

educational setting and teacher response to training on the intervention, and implementation notes based on communications between the OT trainer and participating teachers.

Prior to the training, and at the conclusion of the 10-week intervention, teachers in both the control and experimental groups completed the SPM (or SPM-P) and BASC-2 for each identified student to evaluate the impact of the interventions on the sensory and behavioral areas identified in each measure. These scores were compared to determine the level of change in individual behaviors, processing, and other factors measured as well as to determine overall level of performance changes by student as well as grouped by teacher.

At the conclusion of the study, teachers completed a survey on their experiences implementing the intervention. The results were reviewed overall, to determine the impact of the training, as well as individually, to look for differences in implementation that could impact student results. Questions focused on teacher learning, implementation of movement breaks, implementation of sensory breaks, use of self-regulation and choice tools, and overall perception of the impact of the intervention on students' classroom behaviors. Student scores were used as a framework for examining areas of teacher implementation. This relied on starting with student scores at the high and low end of the ranges, and then examining teacher reporting on implementation, first, through the overall perspective reported in their final survey, and then through the data in their implementation reports. These data were also compared to the OT trainer's notes and correspondence during implementation.

Validity Measures and Checks

This study relies on several forms of validity. First, for triangulation purposes, we sought to examine data points from multiple perspectives. These are summarized in Table 2. Next, in order to avoid easy conclusions, we examined our results for discrepant data, both in terms of student performance and teacher implementation, or other mitigating factors identified in field notes and/or teacher correspondence. As a further validity strategy, we examined the notion of participant reflexivity. This is particularly important in examining the teacher implementation notes and teacher surveys. In terms of the experimental effect and the validity of results corresponding with student growth, students from both the control and experimental groups were measured in late September and after the 10 weeks of the study; while there would have been acculturation effects, those would present equally in both groups, allowing for examination of differences based on the independent variable of the BrainWorks program's effect.

Table 2. Summary of Triangulation Methods Used in Data Analysis

Data source	Triangulation
Baseline BASC and SPM Scores	• Examination of field notes from training • Purposeful sampling and assignment to control and experimental groups
Post-implementation BASC and SPM Scores	• Comparison with datasheets for details on interventions by various teachers to look for patterns • Examination and disclosure of mitigating factors in implementation
Teacher Implementation Repots	• Comparison with teacher surveys • Comparison with student results • Search for discrepant data
Teacher surveys on their	• Triangulation with implementation notes

experiences implementing the measures	• Triangulation with student outcome scores • Search for discrepant data

Exceptional student cases.   A few cases may impact evaluation of data and should be noted; both cases weaken the results in terms of noting change. First, in the case of one student, he was transferred from an experimental to a control classroom during the study. Both the transfer and the fact that a teacher in the control group completed his evaluation may have rendered his gains less significant. Next, one student in the control group was having difficulties in class, and consequently received additional supports. His results may have shown greater improvements overall, thus making the experimental groups' results appear relatively less impactful.

Findings

Given the fact that the students in the study had sensory issues that had previously been unaddressed, the fact that the intervention demonstrated improved classroom functioning is perhaps unsurprising. However, within the results, there was variation both among categories of sensory function and between age subcategories. In addition, the approach of individual teachers in the way that they implemented interventions also produced differential results. Because recent guidelines on human subjects and classroom interventions recommend that the greatest validity in reporting the results of such interventions is presented through percentage change rather than p-scores (Lipsey, Puzio, Yun, Hebert, Steinka-Fry, Cole, Roberts, Anthony, & Busick, 2012), data are presented in this format using delta scores.

Overall Results: Control vs. Experimental Groups

Pre- and post analysis of data based on both the SPM and the BASC-2 showed significant improvement. The overall change for the experimental group based on the SPM reflected a 3.71 T score (5.95%) improvement overall; based on the BASC-2, the experimental group's overall change was 6.1 T score (11.9%) improvement. The control group on the other hand reflected no interventions beyond pre-existing work based on IEP goals to the extent that it was being implemented; overall progress represents a 33 points gain on the SPM (2.5%), and 13.5 (1.27%) on the BASC-2, with positive results only in the visual processing and planning categories. Full SPM results are presented in Table 3 and Figure 1; Table 4 and Figure 2 reflect the impact of the interventions as measured by the BASC-2.

Table 3. SPM Improvements for Experimental and Control Groups Overall

SPM Category	Control Group		Experimental Group	
	Score	**Percentage Change**	**Score**	**Percentage Change**
Social Participation (SOC)	-1.52	-1.65%	7.62	11.8%
Visual Processing (VIS)	4.00	8.20%	5.05	7.74%

Auditory Processing (HEA)	-0.33	1.10%	4.62	7.47%
Tactile Processing/Touch (TOU)	-1.19	-1.34%	1.67	2.98%
Body Awareness (BOD)	-1.81	-1.31%	2.05	3.43%
Balance and Motion (BAL)	-0.62	1.89%	3.10	5.13%
Planning and Ideas (PLA)	0.38	1.18%	4.76	7.26%
Overall	0.33	2.50%	3.71	5.95%

Table 4. BASC 2: Average Change by Area Measured

	Control Group		Experimental Group	
BASC II Category	**Score**	**Percentage Change**	**Score**	**Percentage Change**
Hyperactivity	**2.24**	**3.70%**	**7.10**	**10.8%**
Aggression	**-2.52**	**-4.93%**	**3.52**	**6.5%**
Conduct Problems	**-1.83**	**-3.50%**	**4.50**	**7.7%**
Ext Problems	**-0.67**	**-1.20%**	**5.48**	**9.2%**
Anxiety	**3.05**	**5.86%**	**4.00**	**7.7%**
Depression	**1.00**	**1.84%**	**5.00**	**8.7%**
Somatization	**0.71**	**1.36%**	**2.86**	**5.6%**
Int Problems	**1.95**	**3.64%**	**5.10**	**9.3%**
Attn Problems	**2.62**	**4.01%**	**7.38**	**11.1%**
Learning Problems	**2.17**	**3.16%**	**5.00**	**7.6%**
School Problems	**2.61**	**3.84%**	**6.31**	**9.3%**
Atypicality	**0.81**	**1.26%**	**10.00**	**14.1%**
Withdrawal	**0.71**	**1.16%**	**6.38**	**10.4%**
Beh Symptoms	**1.05**	**1.69%**	**8.29**	**12.6%**
Adaptability	**-1.05**	**-2.35%**	**10.14**	**24.6%**
Social Skills	**0.43**	**1.04%**	**8.52**	**22.3%**

Leadership	1.11	2.87%	4.50	11.5%
Study Skills	-0.44	-1.16%	3.75	10.0%
Funct Communication	-0.33	-0.94%	6.57	17.4%
Adaptive Skills	-0.05	-0.13%	8.43	22.6%
Overall	13.05	1.27%	6.1	11.9%

Analysis. Based on the SPM results, the most dramatic area of improvement occurred in the area of social participation. Further detail from the BASC-2 categories pinpoints adaptability and adaptive skills, social skills and functional communication, and atypicality as areas of improvement typically felt to be contributors to social participation. The skills reflected in the social participation category on the SPM include working well with others, handling frustration appropriately, and maintaining eye contact and appropriate personal space. While these are difficult skills for a clinician to address in a traditional therapeutic setting, the classroom environment is ideal as long as sensory modulation is being addressed to promote success in these skills. Similarly, based on the SPM, the experimental group demonstrated improvements in planning by looking at such skills as organization of materials, problem-solving, and sequencing of tasks. Areas of the BASC-2 reflecting areas critical to those skills may include attention and hyperactivity, learning problems and study skills. These pro-social and academic behaviors have a direct impact on classroom participation, and represent significant opportunities for academic gains and successful functioning in a mainstream classroom.

In the area of visual processing, as measured by the SPM, students in both groups demonstrated improvements. This is interesting because it suggests that students exposed to classroom practices may become accustomed to and adjust for the visual processing demands. Similar gains in this area could also be due to the school's Motor Lab. This is based on the *Ready Bodies, Learning Minds* program which strives to enhance learning readiness through specific movement activities that develop the reflex and sensory systems. In the school where this study took place, the Pre-Kindergarten and Kindergarten classes attend the motor lab daily and the first graders attend every other day.

Gains in auditory processing, a frequent challenge for students with sensory issues, were also notable in the experimental group.

As noted above under the section on student cases and validity, these results may be slightly understated due to the student changes in the experimental and control groups.

Impact of Intervention Based on Age of Students

In terms of both measures, the difference in impact between students PK-2 and students in grades 3-6 in the experimental group is notable in most categories. Based on the SPM, social participation and planning are notable according to SPM results for students in grades PK-2. While students in grades 3-6 showed gains in social participation and auditory and visual processing, they showed negative results in other categories. Researchers believe that this is due to less teacher follow-through due to students' frequent classroom rotations. Teacher surveys show that although the homeroom teachers followed through fairly well on the intervention plan,

the other teachers demonstrated minimal follow-through. Therefore, the students in grades 3-6 received less intervention than kids in pre-K-2. This theory, however, does not explain why the participating students in grades 3-6 improved more than the younger ones on some areas on the BASC-2. It is also possible that the greater improvement seen in the younger grades has to do with the motor lab again; the areas of improvement seen in PreK-2 could be in part due to motor lab which older kids did not experience. Another possibility is that sensory intervention helps most at the sensory system level for younger students and more at the social level for older students.   Based on the BASC-2, students in grades 3-6 made gains that actually exceeded those in grades PK-2, most evident in the areas of social skills and adaptability. More research into these questions could help to clarify these issues.

Variables in original level of performance and teacher implementation may further explain this; further investigation of the impact of the intervention in these areas of functioning would be worthwhile. Of the five teachers who work with students in grades 3 and 4, only the two homeroom teachers of the experimental students stated that they taught the BrainWorks analogy and four of the five teachers stated they only used the recommended strategies occasionally or not at all. This means the students in the experimental group in third and fourth grade only had access to the instruction and strategies a portion of their school days. Of the three teachers who taught the sixth graders in the experimental group, one stated she did not teach the BrainWorks analogy or use the tools provided at all and one stated she used the recommended strategies only minimally. Data are presented in the Tables 5 and 6 below.

Table 5. SPM: Average Change by Area Measured and Age (Experimental Group)

SPM Category	Overall		Students PK-2		Students Grades 3-6	
	Score	Percentage Change	Score	Percentage Change	Score	Percentage Change
Social Participation (SOC)	7.62	11.8%	8.38	12.7%	6.38	10.4%
Visual Processing (VIS)	5.05	7.74%	7.00	10.7%	1.88	2.9%
Auditory Processing (HEA)	4.62	7.47%	6.08	9.0%	2.25	4.2%
Tactile Processing/Touch (TOU)	1.67	2.98%	3.08	5.0%	-0.63	-1.3%
Body Awareness (BOD)	2.05	3.43%	4.85	7.5%	-2.50	-4.9%
Balance and Motion (BAL)	3.10	5.13%	5.54	8.6%	-0.88	-1.6%
Planning and Ideas (PLA)	4.76	7.26%	8.38	12.4%	-1.13	-1.8%
Overall	3.71	5.95%	6.00	9.1%	0.00	0%

Table 6. BASC 2: Average Change by Area Measured and Age (Experimental Group)

BASC II Category	Overall		Students Grades PK-2		Students Grades 3-6	
	Score	Percentage Change	Score	Percentage Change	Score	Percentage Change
Hyperactivity	7.10	10.8%	7.50	12.2%	5.38	8.4%
Aggression	3.52	6.5%	2.43	4.6%	5.25	9.5%
Conduct Problems	4.50	7.7%	5.00	8.5%	3.88	6.9%
Ext Problems	5.48	9.2%	5.36	9.3%	5.25	8.9%
Anxiety	4.00	7.7%	5.71	10.1%	1.38	2.9%
Depression	5.00	8.7%	6.86	11.1%	2.00	3.9%
Somatization	2.86	5.6%	5.07	7.8%	0.63	1.3%
Int Problems	5.10	9.3%	7.57	12.2%	1.63	3.4%
Attn Problems	7.38	11.1%	9.07	13.9%	4.13	6.4%
Learning Problems	5.00	7.6%	10.67	14.2%	0.38	0.6%
School Problems	6.31	9.3%	10.56	14.7%	2.38	3.6%
Atypicality	10.00	14.1%	12.79	16.7%	5.38	8.9%
Withdrawal	6.38	10.4%	9.07	14.0%	2.13	3.8%
Beh Symptoms	8.29	12.6%	10.14	15.0%	4.88	8.0%
Adaptability	10.14	24.6%	8.57	22.0%	11.25	29.2%
Social Skills	8.52	22.3%	6.93	18.2%	10.25	30.6%
Leadership	4.50	11.5%	4.25	10.6%	4.75	12.3%
Study Skills	3.75	10.0%	4.88	12.6%	2.63	7.2%
Funct Communication	6.57	17.4%	7.0	17.3%	5.88	17.7%
Adaptive Skills	8.43	22.6%	8.7	22.4%	7.88	23.1%
Overall	6.1	11.9%	8.46	17.3%	6.63	16%

The most significant variable between the two age groups is that students in PK- first grade are together with the same teacher throughout the day and second graders change teachers only once per day. Thus, the teacher is positioned to conduct interventions systematically and consistently. The older students change classrooms and teachers according to subject matter; thus one or some of their teachers implemented the program during their contact time, but other teachers throughout the day did not. Understandably, the results reflected this variability of approach.

In the next section, we will examine teacher approaches more closely to identify, within each group, the practices of teachers where gains were more notable, focusing specifically on how and when they implemented sensory interventions and movement breaks in order to pinpoint more effective practices for future teachers adopting this intervention model.

Teacher Implementation

Examining the data on teacher averages, the age/grade discrepancies are evident. Teachers of grades PK-2 in the experimental group saw much greater changes than did those of students in grades 3-6, in both the SPM and BASC-2 measures, particularly Teachers 1, 2, and 3; the gains on both measures were relatively consistent. On the BASC-2, however, students working with Teachers 5 and 7 also showed gains; these gains were not matched by corresponding progress measured by the SPM. This may be explained by the fact the SPM is measuring true sensory processing while the BASC-2 is measuring behavioral outcomes. Because neuroplasticity is believed to decrease with age, it may be more difficult to make true gains in actual processing as a person ages, but the strategies may still be beneficial from a behavioral standpoint. The better results on the BASC-2 for the older children could indicate that even though the underlying issues are still present, the students benefit behaviorally from having appropriate strategies in place. The overall discrepancy by grade level suggests that structure and contact time are important, and it is likely that all members of a student's teaching team would require training to implement a systematic approach for a student changing teachers and classes throughout the day, as do those in Grades 3-6. Table 7 displays results by teacher and grade level of teachers in the experimental group.

Table 7. Results of Intervention by Teacher and Grade Level

Teacher	Grade	Average SPM change	Average BASC 2 Change
Teacher 1	Pre-K	5.05	6.67
Teacher 2	K	7.05	10.5
Teacher 3	1	9.14	12.25
Teacher 4	2	2.52	3.17
Teacher 5	3-4/writing	-0.64	8.13
Teacher 6	3-4/social studies	2.79	2.25
Teacher 7	6/LA	1.57	8

In order to determine factors that both enhanced and limited success, we looked further at initial impact of training, implementation, and the teachers' own reported experiences ("teacher feedback"). Table 8 below summarizes teacher interventions. First, regarding the number and percentage of strategies used (Column 3 in Table 8), during the training, teachers were provided with a customized list of all of the sensory strategies recommended for each student based on his SPM results. On the post-intervention survey, teachers rated each strategy 1-5. If they rated it a 4 or 5, it was considered as a "successful strategy." The total number of successful strategies represents the total number of recommended strategies for all students that the teacher worked with.

All the teachers reported experiencing success with at least half of the recommended strategies. Within the group of PK-2 teachers, all those in the experimental group reported that they had taught the BrainWorks Analogy – that students could determine and control their level of alertness and choose activities to self-regulate. While there was not necessarily a correlation between students' understanding of the analogy or the number of recommended strategies that teachers used successfully, the teacher with the highest gains did report that all of her students did use the BrainWorks tool to determine their own needs. This is a significant accomplishment for a child in this age range. The mere fact of offering choices and strategies, however, may be more significant.

Table 8. Teacher implementation data, Experimental Group

Teacher	Grade	# of Recommended Strategies Successful	% of Recommended strategies successful	Teach BW Analogy	Students Understand BW Analogy	% of Students Understanding BW Analogy	Average SPM change	Average BASC 2 Change
Teacher 1	Pre-K	16/18	88.9%	Yes	2 of 3	66.7%	5.05	6.67
Teacher 2	Kindergarten	13/23	56.5%	Yes	1 of 3	33.3%	7.05	10.5
Teacher 3	Grade 1	22/34	64.7%	Yes	4 of 4	100%	9.14	12.25
Teacher 4	Grade 2	13/22	59.1%	Yes	2 of 3	66.7%	2.52	3.17
Teacher 5	Grades 3&4	11/42	26.2%	Yes	5 of 6	83.3%	-0.64	8.13
Teacher 6	Grades 3&4	9/42	21.4%	Yes	6 of 6	100%	2.79	2.25
Teacher 7	Grade 6	10/14	71.4%	Yes	2 of 2	100%	1.57	8

Within the group of Teachers 1-4 – who had contact with their students throughout the school day - the percentage of strategies used does seem to have affected outcomes. However, Teacher 4's outcomes are less than that of Teacher 2, who reported using fewer strategies successfully. All four of the PK-2 teachers did use the BrainWorks tool, and the teacher whose students achieved the greatest gains reported that all students demonstrated understanding of the tool. Within the group, Teacher 2 and Teacher 3 experienced far greater impact in their implementation than did Teachers 1 and 4; for this reason, we examined more closely the approaches of Teacher 3, whose students demonstrated the greatest gains, to those of Teacher 4 whose students made fewer gains as a result of the program. Table 9 below provides greater information on teacher implementation in order to draw distinctions among the teachers of students in grades PK-2 who experienced the greatest and least impact of the changes (Table 9).

At first glance, both Teacher 3 and Teacher 4 reported positive results with increasing their awareness of sensory processing as a way to enhance student performance. Both teachers incorporated daily movement breaks; both used the BrainWorks Tachometer and folders to provide students with tools to monitor their sensory equilibrium and to allow them choices in their sensory break activities. Both also reported overall benefits to their students. The order of magnitude, however, differed significantly between the two.

The greatest difference reported in implementation between Teacher 3 and Teacher 4 is in the use of Sensory Breaks, with Teacher 3 building them into the class schedule and Teacher 4 relying on them on an "As Needed" basis. This is significant for two primary reasons. First, children with sensory processing difficulties are often weak in self-regulation and self-monitoring skills; thus, noting a need is probably outside of their capabilities. If the breaks were not based on student request, it relied on teacher observing behaviors when they got to the level of problematic. Teacher 3, on the other hand, met student needs proactively, which likely contributed to more extended self-regulation of students, i.e., taking the breaks before students lost control, and also provided structure and regularity in the schedule, which is an accommodation useful for many students with sensory processing differences. This difference may pinpoint a need for future trainings: to emphasize the need for teacher scheduling of proactive sensory breaks, rather than awaiting a manifest need presented in the form of student dysregulation (Table 9).

Of the strategies recommended, movement breaks, preferential seating near the teacher, Kore Wobble Chairs, FootFidget® Footrests, and weighted lap pads were the most consistently recognized as being useful to the students based on teacher surveys. Finger fidget toys were identified as being the least helpful, with many teachers stating they caused problems much more than they helped.

Table 9. Comparison of Lower Elementary Teacher Implementation Summary

Teacher	Average Change	Teacher feedback on experience	Teacher feedback on movement breaks	Teacher feedback on sensory breaks	USE of Brainworks Tools	Overall notes
Teacher 3: More gains	SPM: 9.14 BASC 2: 12.25	Participation in this program greatly increased my awareness of sensory processing issues in the classroom.	Short movement breaks were regularly provided in my classroom every 15-45 minutes. While in my class, the students participated in this type of movement break daily.	Sensory breaks were built into our schedule for the assessed students.	I used the BrainWorks tachometer as a teaching tool. Students used the BrainWorks File Folder Tool to select activities based on their sensory needs. Students referred to the colored arrows on the BrainWorks activity cards	The overall atmosphere in my classroom seems to be a more positive one. I have noticed a difference in my performance and focus as well. I try to do as many of the breaks with the students as possible.

					to select appropriate sensory activities.	
Teacher 4: Fewer gains	SPM: 2.52 BASC 2: 3.17	Participation in this program greatly increased my awareness of sensory processing issues in the classroom.	Short movement breaks were regularly provided in my classroom every 15-45 minutes. While in my class, the students participated in this type of movement break daily.	The students were allowed individualized "sensory breaks" on an as-needed basis.	I used the BrainWorks tachometer as a teaching tool. Students used the BrainWorks File Folder Tool to select activities based on their sensory needs.	Teachers need to be open minded about using sensory tools. They really do work and many of my students benefitted from them. Sensory strategies make a big difference in my classroom! This study was helpful for me in so many ways. Not only did I learn how to help my students, but the impact it made was really incredible.

There is also a discrepancy among teachers in the higher elementary grades, who saw their students for only a few hours per day. Teachers 5 and 7 reported relatively high gains in the BASC-2 results, although Teacher 5 used only 26.2% of the strategies successfully and Teacher 7 employed 71.4%. Both reported high rates of students' understanding of the BW analogy (83.3% and 100% respectively), although Teacher 6, whose gains were lower, also reported 100% of understanding. It is noteworthy that all four students in Teacher 6's homeroom showed minimal deficit areas on both assessment tools. In fact, the total scores for all four of these students put them in the "typical" range on the SPM. This could indicate that the problematic areas seen on the BASC-2 are less likely to be rooted in sensory processing issues. As all 3 were the homeroom teachers of the participating students, further analysis of these teachers' implementation notes also follows in Table 10.

In terms of implantation, however, among the teachers of higher elementary grades, there were few differences. Sensory breaks for all were "as needed", so this does not seem to explain the differences in results; use of BrainWorks tools also was parallel among these teachers. The only difference among them seems to be that Teacher 5 scheduled regular movement breaks every 15-45 minutes; others reported regular use but not on the 15-45 minute schedule. Table 10 displays the results.

Table 10. Comparison of Upper Elementary Teacher Implementation Summary

Teacher	Avg Change	Teacher feedback on experience	Teacher feedback	Teacher feedback on sensory breaks	USE of Brainworks Tools	Overall notes
Teacher 5: More gains	SPM: -0.64 BASC 2: 8.13	Participation in this program greatly increased my awareness of sensory processing issues in the classroom.	Short movement breaks were frequently provided in my classroom every 15-45 minutes.	The students were allowed individualized "sensory breaks" on an as-needed basis. Sensory strategies are worthwhile for some students.	I used the BrainWorks activity cards regularly for movement breaks choices. Students used the BrainWorks key ring tool to select activities based on their sensory needs.	The program would be easier to implement for a self-contained classroom. Some of my classes were broken up by P.E. and/or Specials, which I considered an extended break. Only one of the study groups were in the classroom for a full 50 minutes, and that group was allowed more freedom of movement during the entire class period (as long as work continued and was completed). I feel that some modeling of the program in a classroom setting on video would have been helpful. I would have liked more help with setting up the individualized part of the program.
Teacher 7: More gains	SPM: 1.57 BASC 2: 8.0	Participation in this program greatly increased my awareness of sensory processing issues in the classroom.	Short movement breaks were frequently provided in my classroom but not every 15-45 minutes.	The students were allowed individualized "sensory breaks" on an as-needed basis. Sensory strategies make a big difference in my classroom!	I used the BrainWorks activity cards regularly for movement breaks choices. For 6th Grade, I think the main thing that helps is teaching them to recognize when they need a Brain Break, different ways to handle it, and the use of the stools. I think self-regulation should be taught. I would be interested in info/materials that target older students on self-regulation.	I think the study was worthwhile and beneficial to our students. I saw several really "get" their need for it.
Teacher	SPM:	Participation	Short	The students	Students used the	I feel like any long

| 6: Fewer gains | 2.79

BASC 2: 2.25 | in this program greatly increased my awareness of sensory processing issues in the classroom. | movement breaks were frequently provided in my classroom but not every 15-45 minutes. | were allowed individualized "sensory breaks" on an as-needed basis. Sensory strategies are worthwhile for some students. | BrainWorks key ring tool to select activities based on their sensory needs. I think it is a good program. It does help some where others it didn't do much but distract them. | period of work should be broken up. It helps students to not wander and get back focused on their work. |

Discussion and Conclusion

While not generalizable, this study provides evidence in the context of one school district of the impact of a classroom-based sensory program for teachers and students. The classroom improvement gains demonstrate the importance of including this type of approach so that students are able to better focus on their developmental and academic learning. Previous studies in clinical settings have shown similar improvements, but incorporating sensory strategies for student self-regulation in a school setting is relatively new.

It is evident that further research in this area is needed. Given the importance of student outcomes, progress toward IEP and academic goals, and overall well-being within an educational environment, expanding the use of such training and use of systematic approaches can benefit students and teachers alike. Most importantly, this supports teacher efforts to develop effective strategies in order to support their students as they achieve their potential. Moreover, by targeting student awareness, such student-centered tools provide them with the awareness of how to improve their own self-regulation. Thus, as they progress through the school system, the habits of self-regulation will become instilled, enabling students to take control of their own performance and improve their academic outcomes. This will benefit not only the students, but teachers and schools, as student academic progress contributes to the overall success rate and outcomes of schools.

References:

Alibrandi, N., Beacock, L., Church, C., Des Moines, S., Goodrich, K., Harris, L., Sprague, C., Vrtovsnik, L., (2014). *Perceptions and Awareness of Sensory Processing Disorder Among Head Start Personnel* (Master's Thesis). Retrieved from UMI (1558942) http://gradworks.umi.com/15/58/1558942.html

Aspy, R. & Grossman, B. (2007). *The Ziggurat Model: A Framework for Designing Comprehensive Interventions for Individuals with High-Functioning Autism and Asperger Syndrome.* Shawnee Mission, KS: Autism Asperger Publishing Co.

Boekaerts, M., Corno, L. (2005). Self-regulation in the classroom: A perspective on assessment and intervention. *Applied Psychology: An International Review*, *54*(2), 199–231.

Bundy, A.C., Murray, E.A., & Lane, S. (2002) (Eds.). *Sensory Integration: Theory and Practice (2nd Ed).* Philadelphia, PA: Davis.

Cochran, M., New, R.S. (2007). Sensory processing disorder. In M. Cochran & R.S. New (Eds.), *Early Childhood Education: An International Encyclopedia* (721-725). Santa Barbara, CA: Praeger.

Ecker, C. (2010). *Sensory Processing Measure – Preschool (SPM-P).* Los Angeles, Calif.: Western Psychological Services.

Henry, D.A. (2007). *SPM Quick Tips*. Torrance, CA: Western Psychological Services.

Jensen, E. (2000). Moving with the brain in mind. *Educational Leadership, 58*(3), 34-37.

Keller, M. (2001). Handwriting club: Using sensory integration strategies to improve handwriting. *Intervention in School and Clinic, 37*(1), 9-12. doi:10.1177/105345120103700102

Lipsey, M.W., Puzio, K., Yun, C., Hebert, M.A., Steinka-Fry, K., Cole, M.W., Roberts, M., Anthony, K.S., Busick, M.D. (2012). *Translating the Statistical Representation of the Effects of Education Interventions Into More Readily Interpretable Forms*. United States: U.S. Department of Education, National Center for Special Education Research, Institute of Education Sciences, NCSER 2013-3000. Retrieved February 17, 2015 from http://ies.ed.gov/ncser/pubs/20133000/pdf/20133000.pdf

Miller, L.J., Coll, J. R., & Schoen, S. A. (2007). A randomized controlled pilot study of the effectiveness of occupational therapy for children with sensory modulation disorder. *American Journal of Occupational Therapy, 61*, 228–238. doi: 10.5014/ajot.61.2.228

Morris, M. (2007). SPD services in school...How to get what you need. *The SPD Companion, 12*. Retrieved February 19, 2016 from http://www.sensory-processing-disorder.com/The_SPD_Companion-SPD-Services-In-Schools.html

Mulrine, C. F., Prater, M., & Jenkins, A. (2008). The active classroom: Supporting students with attention deficit hyperactivity disorder through exercise. *Teaching Exceptional Children, 40*(5), 16-22. doi:10.1177/004005990804000502

Murray, M., Baker, P., Murray-Slutsky, C. & Paris, B. (2009). Strategies for supporting the sensory-based learner. *Preventing School Failure, 53*(4), 245-251. doi:10.3200/PSFL.53.4

Parham, L. D. (2007). S*ensory Processing Measure: Manual*. Los Angeles, CA: Western Psychological Services.

Pfeiffer, B. A., Koenig, K., Kinnealey, M., Sheppard, M., & Henderson, L. (2011). Research Scholars Initiative— Effectiveness of sensory integration interventions in children with autism spectrum disorders: A pilot study. *American Journal of Occupational Therapy, 65*, 76–85. doi: 10.5014/ajot.2011.09205

Raver, C.C., Jones, S.M., Li-Grining, C., Zhai, F., Bub, K., Pressler, E. CSRP's impact on low-income preschoolers' preacademic skills: Self-regulation as a mediating mechanism. *Child Development, 82*:1, 362–378. doi: 10.1111/j.1467-8624.2010.01561.x

Reebye, P., Stalker, A. (2008). *Understanding Regulation Disorders of Sensory Processing in Children.* In JKP Essentials Series. London : Jessica Kingsley Publishers.

Reynolds, C. R., & Kamphaus, R. W. (2004). *BASC-2, Behavior assessment system for children*. Circle Pines, MN: American Guidance Service.

Schoen, S.A., Miller, L.J., & Sullivan, J. (2015) A pilot study of integrated listening systems for children with sensory processing problems. *Journal of Occupational Therapy, Schools, & Early Intervention, 8*(3), 256-276. doi:10.1080/19411243.2015.1055418

Sensory Processing Disorder Foundation (2014). The Effectiveness of Intensive, Short-term Intervention for Sensory Processing Disorder: A retrospective pretest post-test study. Retrieved from http://www.spdfoundation.net/files/1814/2490/0905/SPDF-ABAS-BASC-Results.pdf

Sensory Processing Institute for Research and Learning (SPIRAL) (2006). Educator Fact Sheet: Signs and Symptoms of Sensory Processing Disorder. Retrieved from http://www.thespiralfoundation.org/pdfs/ed_factsheet.pdf

Shanker, S. (2013). *Calm, Alert, and Learning: Classroom strategies for self-regulation.* Ontario: Pearson Canada.

Swinth, Y. (2015) Do children get enough movement in school? *Journal of Occupational Therapy, Schools, & Early Intervention, 8:*3,193-195. doi: 10.1080/19411243.2015.1095552

Virginia Department of Education, Office of Special Education and Student Services (2011). *Models of Best Practices in the Education of Students with Autism Spectrum Disorders.* Richmond, VA: Author. Retrieved March 16, 2014 from http://www.doe.virginia.gov/special_ed/disabilities/autism/technical_asst_documents/autism_models_of_best_practice.pdf

Worthen, E. (2010). Sensory-based interventions in the general education classroom: A critical appraisal of the topic. *Journal of Occupational Therapy, Schools, & Early Intervention, 3*(1), 76-94. doi: 10.1080/19411241003684217

XXX ISD (2012). NCLB Report Card for Elementary Campus. State: XXX Independent School School District. Retrieved February 18, 2014 (URL redacted for confidentiality).

XXX ISD (2013). XXX District Improvement Plan 2013-2014. State: XXX Independent School District. Retrieved February 18, 2014 (URL redacted for confidentiality).

Lesser Inclusion: An Essay Inspired by Deleuze and Guattari's 'Kafka'

Orru , S. E.

University of Brazilia,

Federal University of Alfenas,

Brazil

Laboratory of Studies and Researching Learning and Inclusion (LEPAI)

Abstract

Education is a fundamental right of citizens. To guarantee this right, legislation was implemented so disabled students could access and remain in schools. This movement was called inclusion. Despite the legislation established, many students have suffered from pseudoinclusion, because despite them having physical access to the school, the welcoming that promotes the feeling of belonging to the group is non-existent. The objective of this text is to make known the concept of 'lesser inclusion' inspired by reading Deleuze and Guattari's 'Kafka: Toward a Minor Literature'. Two interviews were conducted — with a principal and a teacher — as well as a conversation with a group of first-grade children. The results are presented as experiences, in which inclusion is part of the pedagogical philosophy and life of the school community. Finally, lesser inclusion is conceptualized as that which occurs in the difference that differentiates itself without legal impositions as the motivation.

Keywords: *lesser inclusion, difference, education, singularities.*

Introduction

Education policies postulate a collection of national and international laws dealing with everyone's right to education. Nations have been impacted by the inclusion movement, which has resulted in international documents, of which 161 countries are signatories, including Brazil. Some of the international laws that support inclusion are: World Declaration on Education for All (1990), Salamanca Declaration (1994), Guatemala Convention (1999), Charter for the Third Millennium (1999), International Declaration of Montreal (2001), and Convention on the Rights of Persons with Disabilities (2008).

In Brazil, public policies in favor of inclusive education have been developed from contemporary social movements in international and national context. In the scenario of struggle for

equal opportunities to provide education for children, expository indicators and legislations were built to assure the rights of every citizen. Such public policies are designed to end the exclusion mechanisms existing in several social spaces. Here are some of the international and national laws that support inclusion:

Table 1. International and national public policies for inclusive education

Year	International Context	National Context
1988	--	Federal Constitution, Article 205 – Education as the right of every citizen
1989	--	Law No. 7,853/89 – support to people with disabilities and their social integration
1990	World Declaration on Education for Everyone	Child and Adolescent Statute
1994	Salamanca Declaration	National Policy on Special Education
1996	--	Chapter 5th – Law of Guidelines and Bases of National Education,
1998	--	--
1999	Guatemala Convention Letter to the Third Millennium	Decree No. 3,298/99 – regulates Law No. 7,853 / 89, set forth and confirms Special Education as a transversal modality
2000	Montreal International Declaration	
2001	Montreal International Declaration	National Guidelines for Special Education in Basic Education Law No. 10,172 / 01 – National Education Plan
2002	--	Decision No. 01/2002 - National Curricular Guidelines for Training of Basic Education Teachers
2008	Convention about Rights of Persons with Disabilities	National Policy on Special Education from Inclusive Education Point of View

Source: research data (Orrú, 2017).

Even if the laws exist, annihilating probity breaches coexist, as well as the gaps for descending into jurisprudence. Jurisprudence is more important in its occurrence than the laws themselves. It fuels itself and is constituted not by the complex of greater laws, but by the lesser, particular, singular events.

This essay was inspired by reading Deleuze and Guattari's 'Kafka: Toward a minor literature' (published in 2003), in which we reflect on the problem of inclusion. 'Kafka: Toward a minor literature' is a meeting of essays by Deleuze and Guattari, based on issues present in the work of Franz Kafka. It consists of analyses and questions regarding not only the work of Kafka, but a whole political and social period. Minor literature is a concept used by Deleuze and Guattari in a dimension based on the idea of deterritorialization, which refers to a dislocation triggered by the loss of true cultural character via marginalization of ethnic groups that become foreigners in their own language and hide creative power within the indigence of the language. The meaning of 'minor' is related to a 'becoming' that belongs to a minority, which produces lines of escape for the language in order to reinvent resistance and power (Deleuze, 1992).

Although there are greater laws and policies that guide it, inclusion always returns and recreates itself in hostile spaces of cultural, political, and territorial disputes and conflicts, creating chaos and unbalancing what appears to be harmonized. Despite legislation that legitimizes inclusion in the macrosocial context (e.g., school, health, and the labor market), we still encounter the harshness and brutality of discrimination, which creates exclusion mechanisms due to differences in the individual. These spaces envisaged in this study as 'greater' provoke inclusion in their complexity to transcend difficulties, thus creating possibilities for them to occur in contexts in which excluded persons enunciate their voices, which shows that difference is not only theirs, but a quality of the human

species. These microcontexts — in which inclusion is present in a fierce contest with what is already inserted in the macrocontext of the society to differentiate and classify people — is what we conceive as a 'minor/lesser' space that exists and coexists with the 'larger/greater' space.

The objective of this essay was to discuss the concept of lesser inclusion and present experiences in which inclusion is part of the educational philosophy of the school community so that all are beneficially involved.

Method

The methodology was based on the qualitative approach. We held an open interview with the adult participants about inclusion, in order to know what they think about 'difference'; while for the children there was a conversation circle.

According to Mello (2007), conversation circles favor the stimulating of dialog on a particular theme and enable participants to make their voices,
contradictory or not, heard, so that everyone hears what each person has to say, while also encouraging them to position themselves on the topic.

The conversation circle made dialog possible so that the children could talk about the theme. While the children talked about 'difference', they also had the opportunity to observe the thinking shared by their colleagues, and the possibility of giving meaning to the occurrences.

Two interviews were conducted at an elementary school in the south of Minas Gerais state, Brazil: one with the school principal and another with a first-grade teacher. This school was selected because it is: the only one in the city with a pedagogical policy project based on project learning, contrary to the textbook system; and a school with inclusive principles.

The interviews occurred as follows: the words difference, inclusion, and management were presented to the principal; and the words difference, inclusion, and learning were presented to the teacher. The interviews were recorded and the researcher did not intervene.

The conversation circle was conducted with the class of the teacher interviewed — children between 6 and 7 years old. The class had 25 children — two with a diagnosis of autism, one with motor and speech impairments, and four children from different cultures, with three of them the children of immigrants. The children sat side by side. We explained that we would like to talk to them about the contents of a music video. The children were shown the video 'Você vai gostar de mim' [You will like me], sung by Xuxa Meneguel. The lyrics address differences between people, and the images show children who: use wheelchairs, are visually impaired, or have other characteristics. After the video, the children were invited to say whatever they wanted about it. Everyone remained attentive during and after the video presentation. Some appeared shy and preferred not to speak; however, they nodded in agreement or disagreement with their classmates who spoke in the conversation circle. Others recounted various facts about playing around and moments with their classmates in order to indicate that they liked each other, supported each other, and that they all participated in the activities.

We chose excerpts of the speeches that help to understand what we propose as 'lesser inclusion'. There was no intention to analyze content or discourses, but rather to highlight how inclusive processes can occur when respect for differences and the understanding that we are all different is present in the educational philosophy of the school, independent of a 'greater inclusion' established by legislation, which does not guarantee that there will actually be an inclusive education process in the school community.

Lesser inclusion: A concept of welcoming

Lesser inclusion — taking and stimulating the 'minor' concept in 'Kafka' that is latent due to its authors — is not a diminished or less valuable inclusion. We understand that it is the inclusion occurring daily in the various tiny spaces — regardless of the greater law promulgated by the State that demands inclusion — by the conviction that its presuppositions are like a philosophy of life that the minority generates in the territory of a larger policy. It is not a question of the existence of a binarism between 'lesser inclusion' and 'greater inclusion', because according to Deleuze, in the context of Kafka, the minor/lesser language will always occur at the heart of the major/greater language as an ingenious combination of tension in the prevailing language (Deleuze, 1977, p. 38-39).

Lesser inclusion is not pseudolized; however, it is present beyond the role of the school's pedagogical project, and the abstract and the intellectual of the public policies promulgated for greater inclusion. This inclusion — that coexists at the borders, on the dividing line of the excluded/included binary link — is what we call lesser inclusion.

Lesser, in the sense of Deleuze (1977), is that habitual way of proceeding that assumes its scarce and secondary importance regarding the representations and ideologies of the language (in our case, of inclusion), and which accepts exile into the bowels of the loquacious customs of the majority, thus becoming like an outsider in one's own territory, in one's own language, consenting to appear to the particular regional inflection and the non-recognition of the one who speaks out of place or who takes for himself spaces of uncharacteristic and impersonal anonymity.

In a way, the concept of lesser inclusion envisaged here may seem to be at odds with that established by Deleuze (1977). This is because, at first, lesser inclusion should be beneficial only to the minority (those categorized as excluded), but in the understanding that there are no identities, only one identity (that of human being), and that the difference is unique to the human species — not only to those designated as disabled. Thus, lesser inclusion, in its power, is beneficial to all, given that it deterritorializes the territory of those excluded and those included, because every human being, at some time, experiences circumstances in the role of excluded and included.

> *Every society — and also every individual — is, therefore, crossed by the two segments at the same time: one molar and the other molecular. If they differ, it is because they do not have the same: terms, correlations, nature, or multiplicity. However, if they are inseparable, it is because they coexist, they pass between each other, following different figures such as in the primitive ones or in us — but always with one presupposing the other. In short, everything is political, but all policy is simultaneously macropolicy and micropolicy* (Deleuze; Guattari, 2012, p. 90).

Regarding the notion of difference in Kafka, the authors state: *'Because we don't see any difference in all these things (who can tell the difference between a structural, differential opposition and an imaginary archetype whose role is to differentiate itself?)'* (Deleuze & Guattari, 2003, p. 25). Precisely due to being of the human species is why we show immense differences, because we are identical in our unique identity as human beings. Therefore, inclusion that accentuates a certain factitious territoriality becomes a center of disruption of the circumstances and the people, a kind of membrane that is boldly tied to the process of deterritorialization.

Thus, lesser inclusion communicates and manifests itself as a revolutionary process in the bosom of greater inclusion, ruining its call to support or solidarize with a certain homeland ideology — an ideology that, when convenient to the State, supports the excluded, and in another situation, assigns them to perpetual exclusion.

Lesser inclusion involves the production of an organization of beliefs — it transgresses the universal patterns of categorization via difference, and occurs beyond its enforcement mandated by

law. It makes possible the access and permanence of all in the learning spaces, even if they are marginalized by the deficiency-centered diagnoses. The organization of beliefs is a set of values that permeates national and international documents on inclusion and considers that everyone has the right to education.

In lesser inclusion, these occurrences do not happen only to contemplate the legislation and legitimize the intentions of the State. This organization of beliefs in the context of lesser inclusion generates an educational philosophy that encompasses the community — a non-utilitarian or specific philosophy that proposes to think of inclusion as a fundamental problem and, from it, to reinvent inclusive actions in the understanding that people learn in different ways and take different paths, which multiply, so that universal diagnosis does not determine who the learner is.

It provokes the break from the Cartesian paradigm of teaching everyone equally, for it considers the singularities in learning based on the problem of the reinvention of methodological strategies that emerge at the creative power, together with the learners, in order to transgress what is conceptually set — including the decolonization of thought for the production of non-hierarchical knowledge (Deleuze, 1975).

Lesser inclusion — besides being established at the borders and not at the extremities that determine who is in favor or against it — connects the individual in the contiguous historical, political, and social scenario, because 'everything is political' (Deleuze & Guattari, 2012, p. 90).

The 'border' concept is a historical-social process from the symbolic point of view (Deleuze, 1988, 1992). Borders are places of metamorphoses. They are: professed by the ability to transgress what is established; and imbued with multiplicity, reciprocity, and relativity. At the borders, the confines are transposed and other powers are sighted. The border teaches us to live with differences, with the incompleteness of the being and things. They are places where becomings happen, where there is production of the hybris. A place where the cry is echoed, where coexistence is evoked. It is where there are comings and goings. Where there are unpredictable connections and occurrences. Lesser inclusion makes real the occurrence of the plural assembling of the voices, which were previously silenced.

Lesser inclusion transgresses the conventional and the tradition of: overestimating certain scholarly knowledge to the detriment of others, and underestimating individuals who have had their identity dulled by the prophecies of universal diagnosis. It does not disqualify someone by the materialization of symptomatic frameworks. It does not yield to the modes of subjectivation derived from biopower. Lesser inclusion creates conditions so that transformations occur in the sinuosity of the education that — contained in the Law — is ordered, but on many occasions, diverted by the political yearnings of a collective project for a nation that should not be unbalanced by unforeseen events, always at the service of the State's interests.

Lesser inclusion — unlike that which is contained in the laws (greater inclusion) and which is known more in its universal-abstract form — is present as an occurrence beyond the controversy and express problem. It cannot be categorized or understood as static. But with a radical innovator it coexists in the molar and molecular field; that is, in the whole and in the parts, within the greater inclusion and outside it, and it enables the learning and sharing of knowledge through various forms of expression, considering the singularities of the individuals, the difference in the difference[i] in its multiplicity.

> *If they differ, it is because they do not have the same: terms, correlations, nature, or multiplicity. But, if they are inseparable, it is because they coexist, they pass from one to another, following different figures such as in the primitive ones or in us — but always with one presupposing the other* (Deleuze & Guattari, 2004, p. 90).

Thus, there is only the variety of multiplicity; that is, the difference, rather than the enormous opposition of the one and the multiple. And perhaps it is an irony to say 'everything is multiplicity, even the one, even the multiple' (Deleuze, 1988, p. 174).

When inclusion is invoked by those excluded, the actors in the learning communities who weave welcoming webs are called upon to reinvent inclusion, as there are no methods or recipes for doing so. What there is, are assumptions of an organization of beliefs that give life and concretization to the occurrence of inclusion, scrutinizing in its condition of being a fundamental problem the possibilities of favoring the learning of all, without immediate or palliative solutions, but with a framework that understands and accepts differences as something unique to the human species. We understand that, through lesser inclusion, the minority (those with disabilities) deterritorializes the territory; thus, it is composed of those not labeled as disabled or different. Lesser inclusion occurs at the borders, not in territories of those excluded or included.

The path toward inclusion is not easy or simple to grasp or understand. It is complex because it does not: despise the ills existing in the various contexts, feign the absence of obstacles, overvalue certain actions to the detriment of others, or choose enlightened pedagogies for it to materialize. Lesser inclusion all the time at all times is constituted within the borders where all walk, where the hybrid nature of the human condition is present.

Thus, it always traverses long stretches without turning its back on deterritorialization, due to the need to remain tenacious. Lesser inclusion is that which revolutionizes, transgresses, and transforms greater inclusion (provided for in the Law) into a dialectical and ingenious event. It subsists to the extent of the legalistic inclusion that now: serves the interests of the State, grants the right to citizens, and bends to the microphysics of biopower.

Lesser inclusion subsists and coexists with legalistic inclusion (greater inclusion), because its vigor and rhizomatic strengthening are found in the organization of beliefs that constitute the way of life of its subject-actors who conceive and perceive inclusion beyond what is announced in the legislation. And, through conviction, they make their choices for a lesser inclusion, without pseudolizing, maculating, or perpetuating exclusion mechanisms that may be subtle, but are potentially maleficent.

Between lines and borders

Many borders separate one people from another, although our only real identity is that of human being. Borders are invisible; however, they announce ways to dominate others via cartographic policies of the different areas, from the economic to the hierarchization of knowledge.

This apartheid is determined by the invisible lines that are vectors for social exclusion, for they determine how the 'other' is seen and conceived. This case is exemplified by the postcolonialist theories in which there is the presence of a colonizer and his colonizing and, consequently, there is or will be the presence of a mestizo, whose nature will be hybrid, mutant.

Thus, we can say that the inflexible school that supports its practices in determining and accepting only what it considers to be irrefutable — a perpetuator of the homogenization and hierarchization of knowledge — is, in fact, an institution of power, with its students as merely colonized subjects, dispossessed of their knowledge emanating from their experiences.

> *Decolonization is the encountering of two congenitally antagonistic forms, which have their origin precisely in this kind of substantiation, which the colonial situation excretes and feeds. The first confrontation of these forces unfolded under the banner of violence, and its cohabitation — more precisely the exploitation of the colonized by the colonizer — continued thanks to bayonets and cannons. The colonizer and the colonized are old acquaintances. And, in fact, the colonizer is right when he says that he 'knows' them. It was*

> *the colonizer who made and continues to make the colonized. The colonizer takes away their truth; that is, their belongings, from the colonial system* (Fanon, 2005, p. 52).

The docilization of the bodies by disciplinary power and control regulates the other, mutates the body into fractions of organs, annihilates and brutalizes the individual who is subjected to the colonizing power so as to become fragile and vulnerable to all kinds of brutality, both physical and psychic (Foucault, 1998, 2005). This body, under the test of the colonization that converts everything into capital, is consciously gathered by categories of equality from pre-established identities that are converted into the most uncivil forms of difference and social inequality.

The same occurs with disabled students in the school environment. They are colonized. Their differences, subjectivity, and bodies are disregarded — they are seen as one more in the statistics of the institution that serves the interests of the State, whose social function is far from an emancipatory education. To be one more means that you are only a production element for the purposes of capital and, therefore, invisible to society. As a colonized subject, the student is oppressed and silenced, suffering apartheid and falling into social oblivion.

Socio-educational colonization constructs inhospitable, rocky and risky areas of survival. Even if there are laws (greater inclusion) for an inclusive education, the gaps produced by the exclusion mechanisms expel or annihilate the different categorization of that territory. There are various possible exclusion mechanisms; however, the diagnosis delivered by the biopower[ii] is legitimized by the *júris*[iii]for the apartheid of this different. Thus, it assures the convenience and interests of those on this side of the border, ignoring the lethal occurrences (physical and/or psychic) of those on the other, colonized, side.

> *(...) this series of phenomena which I think is quite important: the set of mechanisms by which that in the human species that constitutes its fundamental biological characteristics will be able to enter into a policy, a political strategy, a general strategy of power. In other words, like society, modern Western societies — from the eighteenth century onward — returned to take into account the fundamental biological fact that the human being is part of a human species. It is in general terms what I call, what I have called — to give it a name — biopower* (Foucault, 2008, p. 3).

Inclusion coexists in both spaces and journeys between the lines, at the borders. It is not found in specific territory of its property. It is the escape line itself. It does not serve the interests of the State for capital, but it is the materialization of the cry of the excluded in the territory of the colonizer. Inclusion is the transgression, the transforming agent in this inhospitable territory, and in this condition causes the chaos and imbalance to the predetermined order of the institution of education, of human molding.

However, despite the colonizing territory of the institution of education, whether public or private, education is not in its legal possession, it is not the thing possessed. Education is beyond the territories, it is found at the borders, in the spaces where learning is favored, whether formal or informal. That is why it, by itself, is a Fundamental Right (Unesco, 1990).

Inclusion and Difference

Inclusion brings together the unequal and is composed of its own differences, which differ in their multiplicity. Lesser inclusion is not simply a model of educational inclusion to be followed. It is the power in the occurrence and conducts a transvaluation of principles, which is distinguished by 'opposing higher values, and even denying these values, life as a condition of the value, proposing the

creation of new values that are the values of life, or better, proposing the creation of new possibilities of life' (Machado, 1999, p. 87).

Inclusion neither encourages the division of grades into classes organized based on psychometry, nor does it segregate into a space — separate from the institution — others categorized by the biopower, much less admit exclusion in places created only for the excluded. Inclusion is a movement against all forms of apartheid. Inclusion is hybrid in nature. It is present in the territory of the included ones through the cry of the excluded. In inclusion, merging is a habitual occurrence. It is in the 'hybris that each one finds the being that makes it return, as well as the kind of crowned anarchy, reversed hierarchy that — in order to ensure the selection of difference — begins by subordinating the identical to the different' (Deleuze, 1988, p. 49).

Inclusion requires plural learning spaces in every sense. And the learning process in the context of inclusion must be constructed by the individuals themselves and not hierarchically ordered. In its philosophy it combines and mixes elements for one to: learn to think for oneself, know realms beyond the classroom, live with differences, and be resilient.

In this reinventing of inclusion, learning is an occurrence of the canon of the: unforeseen, creation of the new, and singular thought. There are no recipes on how to learn or teach, and behavioral training is not accepted. Inclusion transgresses the methods for controlling and measuring learning. Nevertheless, learning occurs in a unique way with each person, even if unconsciously. And what is not learned is simply a becoming that will be.

Results
Inclusion, difference, and welcoming: the voices enunciated

There was no intention to analyze the content or discourses of the interviewees, but rather to highlight how inclusive processes can happen when respect for differences and the understanding that we are all different is present in the pedagogical project of the school.

The concept of difference worked on by us and based on Deleuze was not presented to the interviewees, so that they could demonstrate a concept of difference more related to common sense; that is, difference as a quality of: that which is different, and diversity. This must be considered so that the text does not appear to be a contradictory idea of what we discuss as difference.

We presented the words difference, inclusion, and management to the school's principal and asked her to say what she wished about these things. The selected excerpts show a lesser inclusion in which difference and welcoming are the foundation of the school's pedagogical proposal.

- The principal's voice

> *I'll start talking about a former female student who made me think about many things. She is already finishing up high school and someone asked her what she thought about inclusion when she studied here. She said there was no inclusion here. Then her mother asked her: 'but how can you say there is no inclusion there? You studied with that boy!'. She replied, 'No mother, it's because there was no exclusion, so for us nothing was different'. That was the girl's story. In her class there was a boy with cerebral palsy, but he belonged to the group, he did all the activities, all the projects, and there was respect. So, she said that inclusion didn't exist here because there was no exclusion.*
> *She made me think a lot and this message occurred to me and I said 'wow!'. I think we have to increasingly refine the idea that the less exclusion, the less inclusion too. The moment you start with the specifics is when you notice the differences.*

Lesser inclusion is represented naturally in the school. For the student with cerebral palsy, belonging to the group is such a vital event that his classmate responded to her mother that there was no inclusion. This, in the sense that for that student there was not the binary exclusion/inclusion encounter orbiting in the same common center.

> *When the teacher commits, she commits to everyone, to the one who is shyer, the one who needs special care, the one who is more inattentive, and the one who is more aggressive — she commits to everyone.*

The occurrence of lesser inclusion is perceived in the voice of the school principal. She does not refer only to students with a disability, although they are present because of their singularities that require 'special attention', as she says. On the contrary, she mentions students with their own human differences. The meaning of the verb 'commit' engages with the noun 'welcoming'. You commit to, believe in, and invest in who you welcome. In other words, lesser inclusion occurs within the greater inclusion itself (inclusion that is provided for and mandatory in accordance with the current legislation) and beyond it.

-   The teacher's voice

The words presented to the teacher were: inclusion, difference, and learning. Here are the excerpts from the interview for the objective that was proposed for this essay.

> *When I came across this class, it was me who was in fact included! I started thinking differently. Everyone, with their particularities, adds a lot to each other. This class is different, yes! And it has several children who are outside the standards set by society, who need a different outlook. They learn differently. But I think they teach more to the others, who we consider 'normal' [I don't like to use this word], than the others teach them. I learned how to see and discover behind a barrier that is not concrete. And that for me was a priceless [oh, I cannot cry] experience.*

The teacher's voice is the mirror of the meaning of a lesser inclusion that welcomes everyone, including herself. A lesser inclusion that does not happen by legal imposition. It happens because the school is involved in a belief system in which being different is characteristic of the human species, and this difference is not duplicated, but multiplies, because people are not duplicated.

> *My gaze became differentiated. It is not I who accept the different, who works with the different, but it is the different that managed to put me in their world in the most wonderful way possible.*
> *With John, who is wheelchair-bound, we learnt to be his legs. And I see the children in this and it's very beautiful! The children lend their legs to him, they show concern and it is a concern that comes from them. The school works a lot with this project of integration, of respect for the next person, but nevertheless, it comes from them, which is fantastic!*

The experience of receiving John suggested to the teacher and his classmates that some things should be done differently. Solidarity and sharing are principles that are part of welcoming others, and this welcoming is one of the singularities of inclusion that is performed in the difference itself, which is never duplicated.

The teacher's voice is consistent with the principal's voice, in which the school's philosophy enables the integration of all, including the teachers WITH their students and everyone among themselves. It is the occurrence of lesser inclusion within the greater inclusion.

They learned to look at the different with respect, by imagining themselves in another's shoes. For example, Mark's echolalias — they know they need to respect this because sometimes it's uncontrollable. They know that in these echolalias Mark wants to say something regarding his well-being, how he is feeling. They know that this decreases when Mark is calmer, when they contribute to the environment. With John it's the same thing. When he positions himself to participate in the conversation circle they stay silent, one pokes the other and they say 'John wants to talk!'.

In the same class there is an autistic student — Mark — and another with motor and speech impairments — John. The relationship between them is one of: respect for the differences, observing what each one needs, and paying attention to what they have to say. It is not a question of feeling sorry for them or ignoring them, but of constructing dialogical possibilities and experiencing the difference as something present in the human being.

So, I realize that the children are very open. But the adults are more resistant. Today, after this experience, I would receive any child without any reservations. It was a very powerful experience!

The teacher shows that the inclusion experience is engaging and beneficial for the disabled students (the minority); however, it is still not conducive to all (greater inclusion in the legislation). It is not only the disabled students who benefit from the lesser inclusion (a realizing power beyond the *júris*). This experience is an occurrence of lesser inclusion, one that occurs in spaces with infinite learning possibilities for all. It favors those who are in the minority territory (as excluded), and it involves the others in the perception and understanding that difference is in us all.

- The children's voices

We presented the music video 'You will like me'. We asked the children what they wanted to say about what they heard. We selected the excerpts that exemplify the meaning of inclusion and difference.

Renato: *I liked the part that had the people in a little square. They danced and sang. They were all different!*
Roger: *I most liked when it said 'you are different'. It means that one person is not the same as another.*
Bruna: *I thought the music was cool because everyone is different. And everything really is different. Julia is blonde, her hair is the same color as mine, but she's not the same as me, she's another person.*
Jean: *If John cannot play a game, like tag, then we do it differently: you get John in the wheelchair and run alongside him. And the person who is 'it' goes running with him and if the chair touches someone, if Joao touches, then he has tagged and so the other person is then 'it'.*
Moisés: *I play with Mark. He's different, but I really like him. I discovered that we can play differently.*
Renato: *When John wants to swing, he does so in the box swing* [adapted with a supermarket box]. *And when he wants to go down the slippery slide, someone slides with him on their lap.* [On hearing what his classmate says, John — the boy in the wheelchair — smiles on the other side of the room].

Helton: *Hey John, what do you want? What don't you like?* [Helton has autism. He asks John the question due to realizing that he was trying to say something, and he spoke softly, so it was difficult to understand].

John: *I do everything!!!* [he says after smiling, realizing that the classmates were referring to him] and he also gives his opinion on the video that was played: *I don't like Xuxa!* [Everyone laughs with him].

The perception about 'difference' is notorious. They are between 6 and 7 years old, but they understand the meaning of difference through the experiences they have had of being involved in the particularities of a lesser inclusion. They have not consolidated the theoretical concept of inclusion or difference, but they experience it. They found different ways to play, based on the demands of classmates who, due to some deficiency, require different and creative actions. This is how inclusion is reinvented.

We perceived the occurrence of a lesser inclusion in which teachers and students are learners of the difference that differentiates them. Lesser inclusion is not surrounded by the school walls, but in an involving way it expands its spaces beyond the walls, because it is shared by all each time the parents leave and collect their children in the school and observe the occurrences. It happens within the greater inclusion, because it is known by this school community that there is legislation for the promotion of inclusion; however, it transcends this. Lesser inclusion occurs: at each teacher-parent meeting, in which school activities are seen as different from other schools that standardize knowledge and learning rhythms; and every year when everyone meets in different spaces, but with the profound density of the lesser inclusion that welcomes everyone.

Final considerations

Inclusion is often an occurrence imposed by laws organized by the State to guarantee rights, including the right to education. For the promotion of the inclusion in several and different territories around the globe, firstly we must understand that the difference does not affect only the minority, instead, the difference affects everyone, therefore, there are many ways to live and learn. In this scenario, pro-inclusion public policies in international and national context are established beyond beliefs, values and assumptions that are committed to principles of social equality and justice. Such commitment results in a change in basic assumptions of life in society from the academic life of every child. The implementation of public policies in favor of education for everyone is an achievement of many social movements around the globe against prejudice and social discrimination witnessed in contemporary society, also establishes the school space as a place for everyone. By promoting an education that welcomes everyone in their singularities, we build a legacy of fair and compassionate society to future generations.

The law, as a resource for the guarantee of rights, needs to exist, for there are many who see inclusion as a problem that requires immediate solutions in order to not create problems with the State. They do not perceive inclusion as a fundamental problem in which they themselves construct possible solutions that are not statistical or prescriptive. Without the law (greater inclusion), lesser inclusion would perhaps not exist. They coexist.

Inclusion moves, it occurs in the difference that differentiates itself in its multiplicity. Because being singular we are unique, and being one, therefore, we are of the order of the difference. The fact that we are unified does not mean we are the same or similar. We are one because the only identity that really exists is that of being human. Therefore, difference is not the attribute of only a few, because it designates the universal diagnosis of the biopower that creates a specific group of marginalized, excluded, minority individuals. Difference is in everyone, because people are not duplicated — they

differ. Difference contains diversity itself — it is inexact and also the excess of a greatness, and in it there is no repetition.

The inclusion movement is complex, singular, rhizomatic, and radical. For inclusion to occur, difference must be its pair. Inclusion and Difference in their incompleteness can only exist in the difference itself. Inclusion will never be static, it will never be duplicated. It will never occur as a compromise. And it will not be based on homogeneity. Lesser inclusion is a complete occurrence, in which the subjects-actors experience it, and promote it by organizing the beliefs that they generate, which are far beyond the legal impositions.

It is in lesser inclusion4 that we find an infinite possibility of us being learners so that inclusion is always reinvented, in order to benefit everyone nearby through an increasingly less exclusionary society.

---

[i] The difference cited refers to the persons designated as different by the diagnosis. For example, the trisomy of chromosome XXI is conceived as difference — an abnormality in relation to what is considered normal by scientific literature. However, this difference (trisomy of chromosome XXI) differs in its own difference; that is, there will never be people similar or equal via the diagnosis of this trisomy that is repeated. The trisomy is repeated, but the people are not, they are different and they multiply.

[ii] Whose focus is not the individual body, but the collective body.

[iii] Latin expression meaning 'only right'.

[4] The article *Lesser inclusion: An essay inspired by Deleuze and Guattari's 'Kafka* was originally published in Portuguese (Orrú, 2016). The concept of "lesser inclusion" is addressed in the book *The Reinventing of Inclusion* (Orrú, 2017).

References:

Brasil (2008). *Convenção sobre os Direitos das Pessoas com Deficiência [Convention on the Rights of People with Disabilities],* Brasília.

Brasil (1999). *Carta para o Terceiro Milênio [Charter for the Third Millennium],* London.

Deleuze, G. (1988). *Diferença e repetição [Difference and repetition].* Rio de Janeiro: Graal.

Deleuze, G. (1992). *Conversações [Conversations].* São Paulo: Ed. 34.

Deleuze, G. & Guattari, F. (1975). *Mil Platôs: capitalismo e esquizofrenia [A Thousand Plateaus: Capitalism and Schizophrenia].* v. 1. Rio de Janeiro: 34.

Deleuze, G. & Guattari, F. (2012). *Mil Platôs: capitalismo e esquizofrenia* 2 [*A Thousand Plateaus: Capitalism and Schizophrenia* 2], Vol 3. São Paulo: 34.

Deleuze, G. & Guattari, F. (2003). *Kafka – para uma literatura menor [Kafka: Toward a Minor Literature].* Lisboa: Minuit.

Deleuze, Gilles; Parnet, Claire. (2004). *Diálogos [Dialogs].* Lisboa: Relógio D'Água.

Fanon, F. (2005). *Os condenados da terra [The damned of the Earth].* Juiz de Fora: UFJF.

Foucault, M. (1998). *Microfísica do poder [Microphysics of power].* Rio de Janeiro: Graal.

Foucault, M. (2005). *Vigiar e Punir [Monitor and Punish].* 30 ed. Petrópolis: Vozes.

Foucault, M. (2008). *História da loucura [History of the madness].* São Paulo: Perspectiva.

Machado, R. (1999). *Nietzsche e a verdade [Nietzsche and the truth].* Rio de Janeiro: Graal.

Méllo, R. P. et al. (2007). Construcionismo, práticas discursivas e possibilidades de pesquisa [Constructionism, discursive practices, and research possibilities]. *Psicologia e Sociedade*, v.19, n.3, p. 26-32.

Orrú, S.E. (2016). A inclusão menor: um ensaio inspirado na obra "Kafka" de Deleuze e Guattari. *Educação em Foco*, v. 19, n.28, p. 47-73.

Orrú, S.E. (2017). *O Re-inventar da Inclusão [The Reinventing of Inclusion].* Rio de Janeiro: Vozes.

Unesco (1990). *World Conference on Education for All.* Jomtien, Thailand: Unesco.

Unesco (1994). *Salamanca Declaration.* Salamanca: Unesco.

Collaborative Research: A New Paradigm for Systemic Change in Inclusive Education for Students with Disabilities

Andrea L. Ruppar,
Aydin Bal,
Taucia Gonzalez,
Larry Love,
Kate McCabe,
Department of Rehabilitation Psychology and Special Education,
University of Wisconsin-Madison, WI, USA
(ruppar@wisc.edu)

Abstract

Research conducted in collaboration with practitioners has the potential to transform the relationship between research and practice by embedding the research process in the contexts of schools and communities. Collaborative research is well suited to improve inclusive education, because inclusive education reform is situated in local contexts. In this review, we examined research focused on inclusive education, specifically for students with disabilities, that used collaborative research methodologies. We defined collaborative research as partnerships between university- and school-based researchers to examine local issues and extend knowledge in the field. We found that the collaborative research varied widely in relation to research team membership, and team members' roles, and research methodologies. Improving inclusive education through collaborative research will require a paradigm shift in the research community toward conceptually and empirically considering the role of social, historical, and organizational of local school contexts in improving inclusive education.

Keywords*: inclusive education, research methodology, change/innovation, collaborative interests, perspectives, and goals of multiple groups (e.g., parents, teachers, administrators; Vlachou, 1997).*

Introduction

Parents, teachers, and paraeducators report high quality inclusive education as beneficial for all students (Carter & Hughes, 2006; Downing & Peckham-Hardin, 2007).

Jordan, Schwartz, and McGhie-Richmond (2009) found inclusive education teachers who felt responsible for all of their students' learning had stronger repertoires of practice, which benefitted a wider range of learners.

While research in inclusive education has been progressing, many schools and local education agencies have stagnated in the process of change toward more inclusive practices (Ryndak et al., 2014). The lack of progress toward realizing inclusive education for students with disabilities has been attributed, in part, to a need for increasing the capacity of schools to implement inclusive practices. While building capacity among teachers and school teams to support students with disabilities in general education classes has been a priority in research, professional development, and teacher education (Waitoller & Artiles, 2012), the process of capacity building requires careful attention to local school contexts (Ryndak et al., 2014). One promising avenue that could support schools in moving toward transformative understandings of inclusive education is collaborative research.

Collaborative Research in Inclusive Education
Snow (2015) identified partnerships between universities and practitioners, starting with problems of practice identified by practitioners, as an emerging and evolving solution to what was once considered a 'gap' between research and practice. In this paper, we explore the use of collaborative research partnerships between universities and schools to improve inclusive education for students with disabilities. Collaborative research partnerships "*emphasize the interconnections of research and practice*" (Snow, 2015, p. 460) and recognize that effective *research, school-university partnership.*

Despite 40 years of research and policy-level attention to inclusive education internationally, schools continue the struggle of pushing inclusive education beyond integration of students within physical spaces to address the within-school social stratification that disproportionately impacts students with disabilities. Considered a moral imperative which is reflected in initiatives for educational change around the world (UNESCO, 2005), the definition of *inclusive education* is evolving and differs across geographical regions (Opertti & Belacázar, 2008). Depending on the local context, the definition might reflect various minoritized groups such as students from racially, religiously, and ethnically diverse backgrounds, refugees, or students of various gender or sexual identities. However, students with disabilities are consistently considered part of the concept as well as practices (Opertti & Belacázar).

Often described as a social movement in education, inclusive education refers to the process of education within spaces that are designed for and welcoming to all learners, especially those who have previously been excluded from or marginalized within traditional education. The implementation of inclusive education has been characterized as a struggle among the vested sustained systemic change in schools requires active and strategic collaboration among multiple communities of practice (school, district, families, and students). Research conducted in close collaboration with local stakeholders has been identified as a catalyst for school change regarding inclusive education (Ainscow, Booth, & Dyson, 2004). The role of research in inclusive education contexts can be transformative:

> *In inclusive education contexts, praxis – the coupling of critical reflection and action – can be conceptualized as catalytic, communicative, and interactive. That is, research interacts with practice in ways that generate new forms of knowledge about teaching and learning because the act of creating access for those who have been excluded changes*

the environment from a reproducing and assimilative context to a generative and inventive one (Artiles & Kozleski, 2007, p. 362).

Collaborative research methods, though not new, have recently gained new traction in education research due to increased attention to the process of partnering (i.e., universities partnering with schools/communities) by attending to issues of "critical historicity, power, and relationality" (Bang & Vossoughi, 2016, p. 173) and advance the transformative potential of working in collaboration with local stakeholders to produce scholarship that is practical, impactful, and sustained to local contexts (Vakil, McKinney de Royston, Nasir, & Kirshner, 2016). This wave of methods is rooted in critical theories that call for more attention to issues of power and race while disrupting top-down approaches to research (Valik et al, 2016).

By collaborative research we refer to the range of participatory design approaches that blur the boundaries between researchers and researched through partnerships on issues impacting local educational contexts (see Table 1). Collaborative research focuses on contributing to both improved practice and theory building, and could be a promising avenue to researchers and local school community members to work together to create and sustain inclusive schools.

Table 1. A Range of Collaborative Research Methods

Collaborative Research Methods	Defined	Examples
Design-Based Research (DBR)	A context-specific intervention is applied and studied in context through researcher and participant collaboration	Kirshner & Pozzoboni, 2011; Vakil et al., 2016
Participatory Action Research (PAR)	Participants in collaboration with researchers engage in researching and taking action on local issue	Fine et al., 2003
Youth Participatory Action Research (YPAR)	Collaborative research between youth and adults that results in action to create change	Bertrand, Durand, & Gonzalez, 2017; Cammarota & Fine, 2010; Mirra, Garcia & Morrell, 2016)
Practice-Embedded Educational Research (PEER)	The knowledge or research and knowledge of practice combine to addressing a pressing education issue	Snow, 2015
Social/Community-Based Design Experiments	Dynamic and flexible understandings of who is considered researcher with attention to local knowledge systems	Bang, Medin, Washinawatok, & Chapman, 2010
Formative Interventions	Cycles of reflection and action among local stakeholders in collaboration with researchers	Bal, 2011; Gutiérrez, Engeström & Sannino, 2016

Note. There are many iterations of each of these methods (e.g., PAR without researchers). These definitions highlight collaborative methods that involve researchers and local stakeholders.

Given the potential for collaborative research to generate solutions to enduring problems of practice, and the need for attention to local contexts when addressing problems related to inclusive education for students with disabilities, a collaborative approach to research might

present a promising approach to advancing inclusive practices. An understanding of how collaborative research has been utilized to examine and develop inclusive education for students with disabilities will support the development of new collaborative endeavours. Efforts to improve inclusive education will require researchers to adopt a new perspective, tools, and methods on the role of research in changing entrenched exclusionary practices. Therefore, the purpose of this systematic literature review is twofold. First, we review the current status of collaborative research in inclusive education for students with disabilities. Then, we propose a new paradigm for research in inclusive education based on the literature reviewed that is grounded in school-university partnerships for systemic transformation.

Review of Collaborative Research in Inclusive Education

In this review, we examined research partnerships to improve inclusive education in which university-based researchers collaborated with members of local school communities. We were particularly interested in understanding how the process of collaborative research enhanced inclusive education at the local level and contributed to the knowledge base on inclusive education overall.

Inclusionary and Exclusionary Criteria

We used four inclusionary criteria for this research synthesis. First, we included only articles in English published before 2016 in peer-reviewed journals. Second, we included only empirical research focused on inclusion for students with disabilities. Third, we focused our review on research conducted in K-12 schools; studies in early childhood and post-secondary settings were excluded from the review. Fourth, we included only articles describing research that included school personnel or other stakeholders (e.g., teachers, administrators, school psychologists, parents, and students) as part of the research team. Because our purpose was to examine collaborative research relationships between K-12 schools and universities, studies documenting teacher-led action research that did not include a university researcher as part of the research team were excluded from the review.

Search Procedures

The first author conduced an electronic search using Educational Resource Information Clearinghouse (ERIC), PsychInfo, Academic Search Premier, and ProQuest using the following search terms: *participatory research* or *collaborative research* or *action research* and *special education* or *inclusion* or *inclusive education.* Titles and abstracts of articles were reviewed to determine if they met inclusionary criteria. Next, the terms *special education* or *inclusion* or *inclusive education* were searched in the following journals: *Educational Action Research, Action Research,* and *the Canadian Journal of Action Research.* Finally, an ancestral search was conducted of the included articles to identify any other related articles. A second researcher replicated these procedures, and no additional articles were found. In the following sections, we present our findings within the context of the overarching literature on action and collaborative research, and discuss implications for designing collaborative research for inclusive education.

Coding Procedures

Each article was coded according to the following six categories (see Table 2): *Participants, setting, beneficiaries of research, inclusive education outcomes measured,*

researcher roles, methodology, and *location of research*. One researcher coded all 19 articles and approximately 30% (n = 6) were reviewed by a second reader. Inter-rater reliability was calculated at 80%, however, inter-rater reliability on the items *researcher roles* and *methodology* were 17% and 67%, respectively. Because of this low agreement, two researchers reviewed all 19 articles and reached consensus on these items. Finally, each article was reviewed to identify any recommendations for researchers. The articles that provided recommendations were reviewed for recurring themes. The first author identified and summarized these themes.

Results

Research Landscape

The search resulted in 19 articles that met the inclusionary criteria. Table 2 provides details about each of the selected studies. Five of the selected studies (26.3%) were conducted in the United States, ten were conducted in Europe or the United Kingdom (52.6%), and the remaining four (21%) studies were conducted in Canada, Australia, and countries in Africa. Over time, collaborative research has gained in popularity (see Figure 1). Only two articles were published before 2004. Beginning in 2004, at least one article per year was published, with the exception of 2013 and 2015, in which no articles were published. Four articles were published in 2014, the most of any year.

Definitions of Collaborative Research

In describing collaborative research in inclusive education, we must define how *collaboration* and *research* were conceptualized and enacted in the relevant research. First, we describe the ways that the research was conducted in the studies that we reviewed. Then, we explain the variety of ways that collaboration between university researchers and local school community members was explained, focusing on the roles of the university researchers in the process in order to inform future research in this area.

Research methodologies and procedures

Qualitative or qualitative action research (n=11, 57.8%), mixed methods or mixed methods action research (n=5, 26.3%) and quantitative (n=1, 5.2%) methods were used in the 17 studies in which research methodologies were clearly described. Two authors used the term *action research* to describe their methods but did not specify the type of data collected. Interviews (n=7, 36.8%), field notes or other observations (n=4, 21%), and documents (e.g., emails, websites, student work, n=6, 31.5%) were the most frequently used data sources. In several studies (n=4, 21%), researchers did not identify specific analytical procedures. Instead, they identified a particular analytic technique (e.g., constant comparison, inductive content analysis, conversational analysis) without explaining how it was used (i.e., Agnelidies, Georgiou, & Kuriakou, 2008; Cumming, Standrova, & Singh, 2014; Dymond et al., 2006; Mendez et al., 2008). For example, Agnelidies et al. (2008) stated that they followed Creswell's (2009) recommendations for six stages of analysis, but they did not explain their use of a key component of Creswell's procedures – the use of a specific theoretical approach or method for analysis.

Table 2. Collaborative Research Studies Reviewed

|	Purpose(s)	Participants and Setting	Beneficiaries of research	Inclusive education outcomes measured	Researcher Role(s)	Method-ology	Geo-graphic location
Bal et al. (2014a)	Facilitate an inclusive school-based problem solving team to address racial disproportionality in school discipline and special education placement	Elementary school principal, 16 staff members, 13 parents, YMCA representative, and a 5-person research team	School-based committee, including families; culturally and linguistically diverse students with disabilities	No	Co-researcher	Mixed	US
Bal et al. (2014b)	Examine extent and predictors of racial disproportionality in special education in the district and to study how the district leadership used those quantitative analyses in their efforts to address racial disproportionality	School district leadership team (using district-level data)	District-level leadership; culturally and linguistically diverse students with disabilities	No	Co-researcher	Mixed	US
Agryrpoulous and Thymakis (2014)	Develop keyboarding skills of a student with multiple disabilities using assistive technology to "achieve better inclusion"	12-year old girl with multiple disabilities in a 5th grade general education setting	Individual student	Yes	Validation group	Action, not otherwise specified	Greece
Cumming et al. (2014)	Examine the use of iPads as instructional tools and perceptions of students and teachers about iPads to improve UDL	Four students, 13-16 years old with developmental disabilities in a private school	5 teachers and 4 students with developmental disabilities	Yes	External Facilitator	Qualitative Action	Australia

**Lyons (2012)	Examine the use of PAR to resolve role issues in inclusive classrooms	All school personnel in an urban school district in Western Canada	All personnel in the school; all students in the school	No	External Facilitator	Qualitative	Canada
Lynch et al. (2011)	Establish priority areas for developing inclusive itinerant services for students with visual impairment	All practitioners supporting students with visual impairment in 5 districts in Kenya	Teachers → students with visual impairments	No	Co-researchers	Mixed Action	Kenya
Polat (2011)	Investigate how schools can be supported in developing more inclusive practices	8 schools across Tanzania (number of teacher participants varied across the study)	School-based teams	No	External facilitator and critical friends	Qualitative Action	Tanzania
**Sales et al. (2011)	Examine how action research led to changes in teachers' perspectives and contributed to transforming school culture toward inclusion	19 members of school teaching staff in a primary school	Teachers	Yes	External facilitators	Qualitative	Spain
**Agrypoulous and Nikolaraizi (2009)	Impact of action research on teachers and student teachers' professional development and academic access of two pupils	9-year old girl with hearing impairment and 12-year old girl with visual impairment in general education primary schools	Teachers' professional development; students' academic access	Yes	Co-researchers	Qualitative Action	Greece

**Agnelides et al. (2008)	Study the degree to which collaborative action research could contribute to the development of inclusive practices	Three researchers in a primary school	Teachers' practice	Yes	Critical friend	Qualitative	Cyprus
**Davies et al. (2008)	Facilitate inclusion through action research	22 teachers in 6 schools across 2 local authorities	Teachers' practice	Yes	Critical friend	Qualitative	England and Wales
Mendez et al. (2008)	Examine process of transition to a community of learning	13-year old girl with intellectual disability in a public school, special education teacher, and researcher	Student and teacher	Yes	Co-researcher	Action and Qualitative	Spain
Dyson and Gallannaugh (2007)	Examine the barriers to participation and learning, identify practices to overcome barriers, examine extent to which practices facilitate learning outcomes, examine how practices can be encouraged and sustained	Primary school team (head teacher, teacher in a middle leadership position, one or more class teachers)	Teachers' practice	Yes	Co-researcher and critical friends	Mixed methods action	England
Dymond et al. (2006)	Describe experiences of school personnel in redesigning high school science course	General education teacher, special education teacher, special education co-teacher in a high school	Teachers' practice	Yes	Co-researchers	Action and Qualitative	US
Agrypoulous and Stamouli (2006)	Improve inclusion in geometry and geography classes for a student with a visual	12-year old girl with retinopathy of prematurity	Student and teachers	Yes	Co-researcher	Action, not otherwise specified	Greece

	impairment	in a primary school					
Frankham and Howes (2005)	Examine the process of starting an action research project to promote inclusion	School teams at a primary school	Teachers' relationships	No	Research participants and critical friends	Qualitative	England
Jones and Smith (2004)	Evaluate behavior and discipline systems	Schoolwide data for an inner-city secondary school	Perceptions of schoolwide behavior system for reducing exclusions	Yes	External Facilitator[a]	Mixed Action	England
Boudah et al. (2000)	Examine the process of collaborative research	Administrators and teachers in two large high schools	Perceptions of teachers and students, changes in teaching	Yes	External facilitator	Qualitative	US
Welch and Chisholm (1994)	Assess a process-oriented strategy for written expression	29 students in an English class (7 with learning disability)	Intervention for written expression in inclusive classes resulted in improved student outcomes; teacher candidates improved ability to implement interventions use ecological assessment team teaching, use data	Yes	External Facilitator	Quantitative	US

[a]*Note.* The university researcher in this study was also the behaviour coordinator at the school.

NUMBER OF ARTICLES PER YEAR
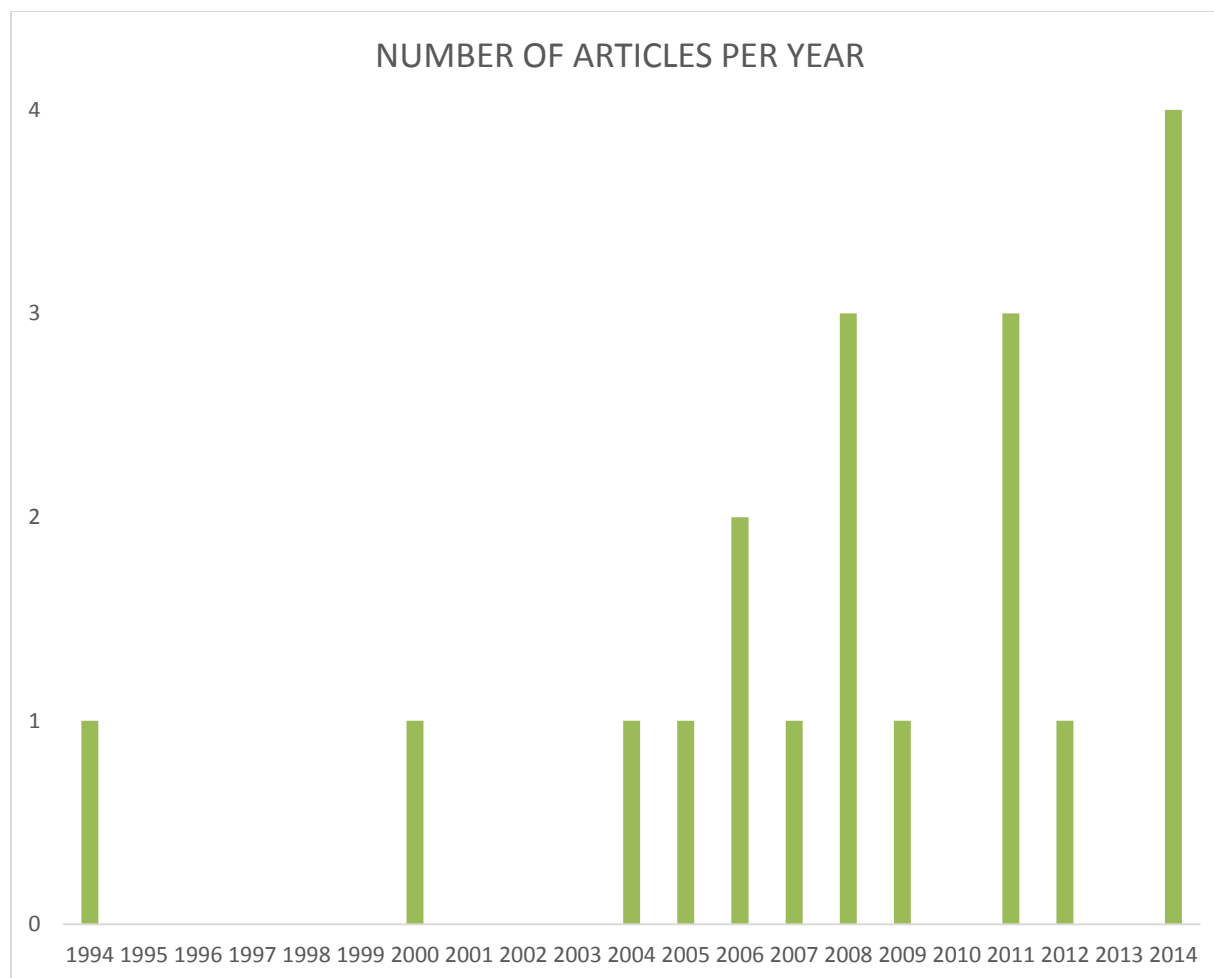
Figure 1. Number of collaborative research articles per year

Of the studies using an action research framework, two specifically named and described which qualitative methods were specifically used (i.e., Agrypoulous & Nikolaraizi, 2009; Cumming et al., 2014). In two studies (i.e., Agryrpoulous & Thymakis, 2014; Agrypoulous & Stamouli, 2006), researchers identified action research as the guiding framework, but they did not report specific data collection or analysis procedures.

Researcher Roles
In this section, we pay particular attention to the ways researchers have situated their roles in relationship to the research. The collaborative relationships between university-based researchers and school-based researchers have the potential to advance knowledge in powerful ways by bringing multiple perspectives to the problem and analysis process, and advantaging the voices of teachers, schools, and students in the research process and findings (Erickson, 1996). The university-based researchers assumed a variety of roles in collaborative research, ranging from facilitators who worked at the university and did not engage at the research site, to collaborators driving action and research decisions. We identified three main categories of university-based researchers' roles: *external facilitator, critical friend, co-researcher* (see Table 2). In one study (Agrypoulous & Thymakis, 2014) the researchers identified themselves as a "validation group,"

which seemed to mirror the critical friend role. In another study (Frankham & Howes, 2005) the researchers were participants in the study. In the following sections, we describe the three most common types of researcher roles: External facilitator, critical friend, and co-researcher.

External facilitator
An external facilitator is the least intrusive of the three identified researcher roles. External facilitators worked outside of the school context to assist with the research process, but were not directly involved in all aspects of the research. Seven studies were identified in this category. In these studies, researchers took on a variety of fluid roles which were, at times, described in ambiguous terms. As external facilitators, some university researchers provided targeted support at critical points in the process (Boudah et al., 2000; Cumming et al., 2014). However, the relationship of an external facilitator to a research team sometimes changed throughout the research process. For example, in Cumming et al.'s (2014) study, university-based researchers were invited to the project when it was already underway. Polat et al. (2011) described researchers with multiple roles, depending on location. Local researchers facilitated the research activities, while others worked at a distance offering expertise, critiques, and probing questions. In Sales et al. (2011), university researchers began the study in a directive role, and gradually transitioned to external facilitation in order to promote the autonomy of the school staff and the sustainability of the school-wide transformation toward inclusive practices. As Sales et al. (2011) demonstrated, universities can strategically fade their presence, using external facilitation as a final step toward school autonomy. Overall, external facilitators seem to provide a supportive rather than a leadership role, although their roles might transition from directive to supportive over the course of a research study.

Critical Friend
In five of the studies reviewed, researchers identified themselves as critical friends of the action research team. The specific roles and responsibilities of critical friends varied across research studies, and were often not explicitly defined. One definition of a critical friend is a knowledgeable third party who provides support as facilitator, consultant, or co-researcher, who maintains a consistent presence of the research team, and who responds to the needs of the research team with suggestions (Dyson et al., 2007). Like external facilitators, critical friends in action research serve a variety of flexible roles. Some of these roles and duties include research advisement, rapport building, meeting facilitation, financial support, conflict resolution, teaching consultation, writing consultation, and provider of resources related to the research process (e.g., academic databases and research equipment). Overall, critical friends provide support rather than driving the research and might offer expertise and guidance in relationship to content and research methodology. Thus, a critical friend is likely to support the research efforts within a school or district, rather than taking a leadership role.

Co-researcher
Whereas external facilitators and critical friends play a supportive role, the term *co-researcher* implies that both the university and school-based researchers take an active position in research from inception to dissemination. Researchers in seven studies partnered with school personnel in this way. The context in which the research is conducted can influence the roles co-researchers take. Geographic location might influence researchers' roles. Lynch et al. (2011) described research that was co-designed, planned, and carried out between researchers based in the United

Kingdom and Kenya. While some university researchers worked at a distance, others were engaged in driving the change and collecting data in the field. Mendez et al. (2008) and Agrypoulous and Stamouli (2006) described research conducted in collaboration with teachers that was designed to specifically address an issue in classrooms. In these studies, the university researchers worked alongside teachers in the classrooms to collaboratively work on a particular problem and evaluate the outcomes. University researchers have also taken total ownership over the research-related duties of a participatory action research project. In Dymond et al. (2006), university researchers were responsible for the research design, data collection, and analysis, while school-based researchers were responsible for the development and implementation of the intervention.

Across these studies, two issues in co-researcher roles were evident. First, some university researchers seem to take more control over the research aspects of a project than others, implicitly or explicitly leaving the "action" to the school-based partners. Because university researchers bring knowledge and resources about research design, data collection, and analysis to a collaborative research relationship, their leadership was important to ensuring that the school-based researchers find answers to the issues they face. They also built coalitions among multiple stakeholders with diverse and often conflicting experiences, perspectives, and goals to examine and address tension-filled issues such as racial disproportionality in special education (Bal et al., 2014b). However, as Frankham and Howes (2005) recognized, researchers are also part of the "action" in action research and thus constitute part of the data. Thus, a second problem arises in that university researchers often fail to be explicit about their role in driving the change that occurs through the research.

A trend toward more explicitly collaborative research in recent years was noted. Bal et al. (2014a; 2014b) described a collaborative relationship among university researchers, district and school administrators, teachers, parents, and students, to ameliorate disproportionate identification of minority students in special education and exclusionary school discipline in the state of Wisconsin. A collaborative problem-solving process, *Learning Lab*, guided by critical pedagogy (Freire, 2000; Ladson-Billings, 1995) and activity theory (Engeström, 1987; Vygotsky, 1978) provided framework for identifying the problem, continually examining and re-examining the context, reaching possible solutions, and examining the effects of the solution. While engaging in research to co-examine the process and effectiveness of the intervention, multiple stakeholders, specifically those from historically marginalized racial, linguistic, and economic communities, participated the process resulting in a deep local understanding of the problem and a grassroots-driven solution. Importantly, this design prioritizes the democratic process, allowing an explicitly horizontal structure among research team members and creating explicit procedures for prioritizing the diverse perspectives and goals of the stakeholders (Gutiérrez & Vossoughi, 2010). Learning Labs served as research and innovation sites for the university-based researchers as well as practitioners. University researchers developed new techniques of collective problem solving such as system mapping in facilitating a reciprocal and transformative school-family-community-university partnership (Bal, 2014a).

Outcomes of Research

The collaborative research studies that we reviewed affected a variety of outcomes in relationship to inclusive education. Most commonly, service delivery processes were examined and improved. For example, Dymond et al. (2006) examined the implementation of universal design for learning by a team of general and special educators in a general education science

class that included students with significant disabilities. Collaborative research also allowed school teams to self-evaluate and develop new practices. In Dyson and Gallanaugh (2007), researchers worked with a school team to identify the local barriers to inclusive education and evaluate of the use of practices to facilitate and sustain positive outcomes through inclusive education. Similarly, Bal et al. (2014b) and Jones and Smith (2004) used collaborative research to systematically examine school and district-wide data in order to inform the development and improvement of service delivery.

At the student level, collaborative research has been used to improve students' participation and progress in inclusive classes. For example, Agrypoulous and Thymakis (2014), Agrypolous and Nikolaraizi (2009), and Agrypolous and Stamouli (2006) examined the use of various adaptations and supports to support class participation for students with disabilities. However, the data were not collected and analysed systematically. Therefore, while the results of these studies might inform practice, they do little to inform the research base on inclusive education. Welch and Chisholm (1994) used group experimental design to examine the effectiveness of a writing intervention in an inclusive classroom. Despite the limitation of a small sample size (n = 29), this research demonstrates that collaborative research can be used to systematically test new interventions using accepted research designs.

Challenges and Recommendations

A key purpose of this review was to identify strategies for conducting collaborative research in the area of inclusive education. Recommendations for researchers are often provided in the discussion section of articles to share lessons learned. A subset of articles (n=13, 86.6%) provided recommendations for researchers. Two recurring themes (i.e., recommendations that were made across more than one article) were identified in the recommendations for researchers: a) recommendations about the amount of time necessary to complete collaborative research; and b) strategies for dealing with tensions between university and field-based researchers.

Time. Collaborative research often was described as time consuming (Agnelides et al., 2008; Boudah et al., 2000; Dymond et al., 2006; Snow, 2015). Boudah et al. (2006) explained the time required was both *extensive* and *intensive.* The process of engaging school-based researchers in a collaborative project is difficult to begin and sustain, due to constraints on school community members' busy schedules, school vacations, and competing priorities. Dymond et al. (2006) suggested that research teams should create a realistic time frame for change to occur, recognizing that cooperative planning is critical to developing school-based researchers' knowledge about inclusive education practices as well as research techniques.

Tensions. The purpose of collaborative research for inclusive education is to actively initiate and evaluate a change toward inclusive practices. Because transformation toward inclusive education involves individuals with multiple competing gaols and interests (Vlachou, 1997), tensions between the research team and others in the school can arise. Davies et al. (2008) described tensions that were the result of competing political priorities and the goals of the research team, specifically in relationship to the research team's goal of reflective practice in the context of high-stakes testing. Davies et al. (2008) also described tensions between what they described as a "medical model" and a "constructivist" stance toward teaching. The authors found that teachers were reluctant to critically examine their own practices because they believed that that the students' difficulties were due to deficits within the child rather than problems with the way the child was being taught, hampering the progress of change. Tensions can also arise between university researchers and school partners. Dymond et al. (2006) found that school team

members wished university researchers would spend more time in the classroom, observing students, so that they could provide more specific suggestions. Teachers on the team also expressed frustration at the amount of time it took to systematically re-design instruction and precisely measure outcomes.

Discussion

Our review showed that collaborative research on inclusive education varies widely in terms of methodology, unit of analysis, and strategies. This variety made it difficult to draw conclusions about the scope and depth of the research base on inclusive education that uses collaborative methods. A robust framework for designing and evaluating collaborative research in inclusive education is needed. Such a framework will lead to a more cohesive and richer research base from which patterns might emerge, resulting in a more focused direction in collaborative research in inclusive education. Specific goals and procedures for designing collaborative research in inclusive education may provide guidance for researchers who engage with community members around practical issues of significance. Moreover, a specific definition of collaborative research, as well as the key components in the process, may provide the field with a more structured approach to engaging community members in the research process.

Scholars have recognized that mere publication of research results, offering new standards, assessments and curricula, and providing professional development workshops to practitioners have had limited impact in transforming education systems, solving the everyday challenges that educators, students, families, and education leaders experience in schools, and improving outcomes (Artiles, Dorn, & Christensen, 2006; Berliner, 2006; Darling Hammond, 2010; Donovan, 2013; Snow, 2015). These tools, practices and programs will come up against inevitable challenges regarding their uptake, implementation and relevancy to vastly diverse local school contexts. Donovan (2013) suggested, "if we create the organizational capacity for researchers and design experts to work with practitioners inside the system, we could potentially change the outcome." (p. 319). This requires a paradigm change, major changes in infrastructure, and the tools and ways of doing things in the education research community (Bal, 2016). The new paradigm for collaborative scientific inquiry requires researchers to increase their reflexivity, relevancy, and comfort with the complexities of the real life of schools.

Our review revealed that a shift is needed in the ways that problems are defined. Researchers have partnered with teachers and school teams to solve particular problems of practice, such as the use of adaptations for individual students in inclusive classes, but interventions rarely address the systemic patterns of exclusion that might have led to the problems of access faced by students. As Snow (2015) explained, the "recognition that students and teachers operate within systems and that improvements inside classrooms require thinking about and often operating at school and district levels at the same time" (p. 462). Thus, rather than addressing isolated problems within individual schools, collaborative research in inclusive education should attend to multiple systems of influence simultaneously (Ruppar, Allcock, & Gonsier-Gerdin, 2016).

Because systemic change is a multifaceted process of shifting practices, perspectives, and ideal and material tools (e.g., cultural models, scripts) in research and practice, researchers seeking change should engage with the values and power relations within educational settings (Ainscow, 2012). Relationships among researchers and practitioners must be intentionally structured to reduce power inequities and create spaces for dialogue about differences in values and ideology. Changes toward inclusive education are often met with resistance due to

ideological differences among educators (Olson, Roberts, & Leko, 2016). Practice-embedded research in the area of inclusive education will require specific attention to the ways stakeholders perceive and understand problems, and new frameworks are needed to support teams of collaborative researchers in moving past the stage of problem identification into research design and action.

Moreover, it is important to be careful in determining research team membership. In the research that we reviewed, partnerships were formed between researchers and the practitioners who were faced with challenges in relationship to inclusive education. Yet, none of the research teams included individuals with disabilities or students on the research team. Students are at the centre of inclusive education efforts, yet they are seldom invited to engage in the work. Youth participatory action research (YPAR) is a robust example of a collaborative method grounded in assets-based epistemologies that recognize the valuable insights and experiences that youth bring to work rooted in social change. Who understands the nature of school inclusion (and exclusion) better than youth? YPAR involves youth working in collaboration with adults as active participants in advancing social change. While YPAR was not included in the collaborative research we reviewed, we posit that youth with disabilities and other non-dominant youth can play important roles in advancing inclusive education.

Limitations

We found few studies overall that met our inclusion criteria. There are two possible explanations for this. First, researchers might not explicitly state when research is collaborative; thus, this review might not include all of the research on inclusive education using collaborative methods. The use of keywords that identify the research as collaborative, such as the ones included in our search, will make it easier to locate and review collaborative research in the future. A second possible interpretation is that collaborative research is not a widely-used approach in inclusive education. Finally, relevant articles might have been screened out because researchers did not specifically use the term *inclusive education* in the keywords, even if the research resulted in more inclusive outcomes.

Directions for Future Research

Collaborative research has the potential to improve inclusive education because it is intentionally situated in the everyday work of educators. However, we had difficulty locating relevant articles. Future researchers should explicitly position their work as collaborative in order to increase the visibility of collaborative research in the mainstream of inclusive education inquiry, and also be explicit about the inclusive education outcomes of their research. Locally meaningful and ecologically valid research to understand the complexities in the real life of educators and schools can lead to the uptake and implementation of research-based programs and interventions in reciprocal collaboration with local stakeholders (Bal & Trainor, 2016; Donovan, 2013). Because of the potential benefits of this research approach for bridging research and practice, future researchers should consider ways to develop reciprocal, locally meaningful, and sustained partnerships with local stakeholders and purposefully collaborate with community members in rigorous research activities to build more inclusive and transformative schools for *all*.

References:

Note. * indicates article was included in the review.

Ainscow, M., Booth, T., & Dyson, A. (2004). Understanding and developing inclusive practices in schools: a collaborative action research network. *International Journal of Inclusive Education*, *8*(2), 125-139.

Allan, J. (2006). Failing to make progress? The aporias of responsible inclusion. In E. Bratlinger (Ed.), *Who benefits from special education?: Remediating (fixing) other people's children*. Mahwah, New Jersey: Lawrence Erlbaum Associates.

* Dymond, S. K., Renzaglia, A., & Rosenstein, A. (2006). Using a participatory action research approach to create a universally designed inclusive high school science course: A case study. *Research and Practice for Persons with Severe Disabilities*, *31*, 293–308. http://doi.org/10.1177/154079690603100403

*Angelides, P., Georgiou, R., & Kyriakou, K. (2008). The implementation of a collaborative action research programme for developing inclusive practices: Social learning in small internal networks. *Educational Action Research*, *16*, 557–568. http://doi.org/10.1080/09650790802445742

Anyon, J. (2005). *Radical possibilities: Public policy, urban education, and a new social movement*. New York: Routledge.

* Argyropoulos, V. S., & Nikolaraizi, M. A. (2009). Developing inclusive practices through collaborative action research. *European Journal of Special Needs Education*, *24*(2), 139–153. http://doi.org/10.1080/08856250902793586

*Argyropoulos, V. (2006). A collaborative action research project in an inclusive setting: Assisting a blind student. *British Journal of Visual Impairment*, *24*(3), 128–134. http://doi.org/10.1177/0264619606066187

* Argyropoulos, V., & Thymakis, P. (2014). Multiple disabilities and visual impairment: an action research project. *Journal of Visual Impairment & Blindness,* March-April 2014, 163-167.

Artiles, A. J., Dorn, S., & Christensen, C. (2006). Learning in inclusive education research: Re-mediating theory and methods with a transformative agenda. *Review of Research in Education*, *30*, 65-108.

Artiles, A. J., & Kozleski, E. B. (2007). Beyond convictions: Interrogating culture, history, and power in inclusive education. *Language Arts, 84,* 351-358.

Artiles, A. J., Kozleski, E. B., Gonzalez, T. (2011). Beyond the allure of inclusive education in the United States: Facing difficult questions, tracing enduring challenges. *Revista Teias, 12,* 285-308.

Bal, A. (2016). From intervention to innovation: A cultural-historical approach to the racialization of school discipline. *Interchange, 47,* 409-427. doi:10.1007/s10780-016-9280-z

* Bal, A., Kozleski, E. B., Schrader, E. M., Rodriguez, E. M., & Pelton, S. (2014a). Systemic transformation from the ground-up: Using learning lab to design culturally responsive schoolwide positive behavioural supports. *Remedial and Special Education*, *35*, 327–339. http://doi.org/10.1177/0741932514536995

* Bal, A., Sullivan, A. L., & Harper, J. (2013). A situated analysis of special education disproportionality for systemic transformation in an urban school district. *Remedial and Special Education*, *35*, 3–14. http://doi.org/10.1177/0741932513507754

Bang, M., & Vossoughi, S. (2016). Participatory design research and educational justice: Studying learning and relations within social change making. *Cognition and Instruction*, *34*(3), 173-193.

Berliner, D. C. (2006). Our impoverished view of educational research. *Teachers College Record*, 108(6), 949-995.

* Boudah, D. J., Knight, S. L., Kostohryz, C., Welch, N., Laughter, D., & Branch, R. (2000). Collaborative research in inclusive classrooms: An investigation with reflections by teachers and researchers. *Teacher Education and Special Education*, *23*, 241–252. http://doi.org/10.1177/088840640002300306

* Cumming, T. M., Strnadová, I., & Singh, S. (2014). iPads as instructional tools to enhance learning opportunities for students with developmental disabilities: An action research project. *Action Research*, *12*, 151–176. http://doi.org/10.1177/1476750314525480

Darling-Hammond, L. (2010). Teacher education and the American future. *Journal of Teacher Education*, *61*(1-2), 35-47.

* Davies, S. M. B., Howes, A. J., & Farrell, P. (2008). Tensions and dilemmas as drivers for change in an analysis of joint working between teachers and educational psychologists. *School Psychology International*, *29*, 400–417. http://doi.org/10.1177/0143034308096439

Donovan, M. S. (2013). Generating improvement through research and development in education systems. *Science, 340*, 317–319.

Dyson, A. (1999). Inclusion and inclusions: Theories and discourses in inclusive education. In H. Daniels and P. Garner (Eds.). *World Yearbook of Education 1999.* New York: Routledge.

* Dyson, A., & Gallannaugh, F. (2007). National policy and the development of inclusive school practices: a case study. *Cambridge Journal of Education*, *37*, 473–488. http://doi.org/10.1080/03057640701705690

Erickson, F. (2006). Studying side by side: Collaborative action ethnography in educational research. In G. Spindler & L. Hammond (Eds.) *Innovations in Educational Ethnography: Theories, Methods, and Results.* Hove, UK: Psychology Press.

* Frankham, J., & Howes, A. (2006). Talk as action in "collaborative action research": making and taking apart teacher/researcher relationships. *British Educational Research Journal*, *32*, 617–632. http://doi.org/10.1080/01411920600775324

Gutiérrez, K., & Vossoughi, S. (2010). Lifting off the ground to return anew": Documenting and designing for equity and transformation through social design experiments. *Journal of Teacher Education*, *61*(1-2), 100-117.

* Jones, J., & Smith, C. (2004). Reducing exclusions whilst developing effective intervention and inclusion for pupils with behaviour difficulties. *Emotional and Behavioural Difficulties*, *9*, 115–129. http://doi.org/10.1177/1363275204045732

Kozol, Jonathan. (2005) *The shame of the nation: The restoration of apartheid schooling in America*. New York: Random House.

Kurth, J. A., Morningstar, M. E., & Kozleski, E. B. (2015). The Persistence of Highly Restrictive Special Education Placements for Students With Low-Incidence Disabilities. *Research and Practice for Persons with Severe Disabilities*, *39*, 227–239. http://doi.org/10.1177/1540796914555580

* Lynch, P., McCall, S., Douglas, G., McLinden, M., Mogesa, B., Mwaura, M., Muga, J., & Njoroge, M. (2011). Inclusive educational practices in Kenya: Evidencing practice of itinerant teachers who work with children with visual impairment in local mainstream schools. *International Journal of Educational Development*, *31*, 478–488. http://doi.org/10.1016/j.ijedudev.2010.08.006

* Lyons, W. E. (2012). Examining role issues in inclusive classrooms through participatory action research. *The Canadian Journal of Action Research*, *13*, 19-37.

* Méndez, L., Lacasa, P., & Matusov, E. (2008). Transcending the zone of learning disability: learning in contexts for everyday life. *European Journal of Special Needs Education*, *23*, 63–73. http://doi.org/10.1080/08856250701791328

Olson, A., Roberts, C. A., & Leko, M. (2016). Providing students with severe disabilities access to the general curriculum. *Research and Practice for Persons with Severe Disabilities, 41,* 143-157. doi: 10.1177/1540796916651975

Opertti, R., & Belalcázar, C. (2008). Trends in inclusive education at regional and interregional levels: issues and challenges. *Prospects*, *38*, 113–135. http://doi.org/10.1007/s11125-008-9062-1

* Polat, F. (2011). Inclusion in education: A step towards social justice. *International Journal of Educational Development*, *31*, 50–58. http://doi.org/10.1016/j.ijedudev.2010.06.009

Rogoff, B. (2003). *The cultural nature of human development*. New York, NY: Oxford University Press.

Ruppar, A. L., Allcock, H., & Gonsier-Gerdin, J. (2016). Ecological factors affecting access to general education content and contexts for students with significant disabilities. *Remedial and Special Education*. http://doi.org/10.1177/0741932516646856

Ryndak, D. L., Taub, D., Jorgensen, C. M., Gonsier-Gerdin, J., Arndt, K., Sauer, J., et al. (2014). Policy and the impact on placement, involvement, and progress in general education: Critical issues that require rectification. *Research and Practice for Persons with Severe Disabilities*, *39*, 65–74. http://doi.org/10.1177/1540796914533942

* Sales, A., Traver, J. A., & García, R. (2011). Action research as a school-based strategy in intercultural professional development for teachers. *Teaching and Teacher Education*, *27*, 911–919. http://doi.org/10.1016/j.tate.2011.03.002

Slee, R. (2013). How do we make inclusive education happen when exclusion is a political predisposition? *International Journal of Inclusive Education*, *17*(8), 895-907.

Snow, C. E. (2015). 2014 Wallace foundation distinguished lecture: Rigor and realism: Doing educational science in the real world. *Educational Researcher*, *44*, 460–466.

United Nations Educational Scientific and Cultural Organization (UNESCO). (2005). *Guidelines for inclusion: Ensuring access to education for all.* Paris: UNESCO.

Vakil, S., McKinney de Royston, M., Suad Nasir, N. I., & Kirshner, B. (2016). Rethinking race and power in design-based research: Reflections from the field. *Cognition and Instruction*, 34(3), 194-209.

Vlachou, A. (1997). Struggles for inclusive education: An ethnographic study. Maidenhead, UK: Open University Press.

Vygotsky, L. S. (1978). *Mind in society.* Cambridge, MA: Harvard University.

Waitoller, F. R., & Artiles, A. J. (2013). A decade of professional development research for inclusive education. *Review of Educational Research*, *83*, 319–356.

* Welch, M., & Chisholm, K. (1994). Action research as a tool for preparing specialists to use strategic interventions in educational partnerships. *Teacher Education and Special Education: the Journal of the Teacher Education Division of the Council for Exceptional Children*, *17*, 269–279. http://doi.org/10.1177/088840649401