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Pre-service Arts Teachers' Perceptions of Inclusive Education Practice in Western Australia

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Abstract

The creation and maintenance of inclusive learning environments is a key responsibility of all teachers working in Australian schools. Most Australian universities embed inclusion education training for pre-service teachers (PSTs) in coursework. There is an implicit assumption in these arrangements that the study of inclusion and of special needs education completed at university will translate into practice when PSTs are working in schools. This phenomenological mixed methods research design investigated how effectively inclusion education translated into practice. The results revealed that while PSTs were aware and supportive of inclusion, no clear links were made between theory and practice.

Keywords: *Inclusive Practice; Arts Education; Inclusive Arts Education; Artists in Residence; Pre-Service Teachers; Special Needs Education, Additional Needs.*

Introduction

Australian teachers are required under legislation, and also by the Australian Institute of Teaching and School Leadership (AITSL) professional teacher standards, to create and maintain inclusive learning environments for all children in their classes. With the passing of the Disability Discrimination Act (1992) and the presence of increasing numbers of children with special needs included in regular classrooms, many PST education programs at Australian universities began to provide formal studies to prepare graduates for this challenging role. This is an increasingly complex undertaking as the notion of special needs has expanded over recent decades to include children with a wide range of learning difficulties and disabilities/disorders, including autism

spectrum disorder and dyslexia, as well as children who are gifted. Despite sound theoretical preparation during PST education, there is still some concern that many Australian children with 'special needs' may not receive the support they require in regular classrooms. Many Australian schools increasingly seek to innovate and offer enrichment programs for students with special needs. This includes in-class support with an education assistant or via education support centres on school premises.

The Arts have long been acknowledged as instruments for social inclusion because they draw on alternate understandings of intelligence and they value difference and divergent or novel thinking. Programs in which classroom teachers collaborate with external colleagues through special arts based learning projects framed around creativity education have been shown to have good success (Paris, 2013). Sternberg (2006, 2017) considers creativity to be an invaluable life skill which is achievable for all under the right environmental and educational conditions, noting:

Creativity comprises several different aspects: (a) abilities, (b) knowledge, (c) styles of thinking, (d) personality attributes, (e) motivation, and especially intrinsic motivation, and (f) environment. ... It is crucially important, especially in schools, to provide an environment that allows creativity to flourish – not just in word, but also in deed. (2017, para. 4)

Sternberg's (2017) focus on the centrality of 'environment' (encompassing critical human resources and infrastructure supports) as a key driver of creativity in education intersects with emerging school inclusion agenda reform employing arts collaborations. In such collaborations, for example, school based Artist in Residence (AiR) programs, community artists often partner with generalist teachers for creativity education for the benefit of students. Bresler, DeStefano, Feldman and Garg, (2000) report that generalist teachers who do not usually have high levels of artistic skill and or expertise working in partnerships with artists, can achieve positive inclusive educational outcomes for students.

As legislation increasingly demands more of teachers in their efforts to accommodate children with special needs, the potential of the arts to foster inclusion, offers a pathway to improved educational experience for children with special needs. What is less well understood, however, is the readiness of graduate teachers to meet their responsibilities in inclusive education. Teaching and research academics involved in teacher education preparation, raised concerns about PSTs' abilities to create and maintain inclusive classrooms during their teaching practicums and beyond. The capacity to create an inclusive classroom is, in the current authors' view, contingent on PSTs being able to recognise students with special needs and to have the knowledge capacity to respond to those needs. This study hypothesised that failure by PSTs to identify/recognise students' needs would present a barrier to inclusive practice. In addition, our students' understandings of inclusive practice were of interest to us within our teacher education improvement framework.

The Arts are beneficial for individuals

Numerous studies have demonstrated the positive impact which involvement in the Arts (dance, drama, media arts, visual arts and music) affords individuals through arts making and arts responding experiences. The Australian and Western Australian Curriculum, supported by the School Curriculum and Standards Authority (2017), note the centrality of the Arts as one of five compulsory learning areas for students from kindergarten to Year 12. It proposes that, "*The Arts have the capacity to engage, inspire and enrich all students, exciting the imagination and encouraging them to reach their creative and expressive potential*" (para. 1). Further that, "*The Arts entertain, inform, challenge, and encourage responses, and enrich our knowledge of self,*

communities, world cultures and histories. The Arts contribute to the development of confident and creative individuals, nurturing and challenging active and informed citizens” (para. 3).

Eisner (2002, 2009) identified many positive contributions the arts make to holistic development in children. Over three decades, he advocated for the centrality of the arts in education and, whilst lamenting that education systems still generally prioritise the hard sciences over arts, observed deeply impactful positive outcomes accruing where education leaders reconceptualise schooling to place the arts at the centre of curriculum. Over time, involvement in the arts often leads to increased self-efficacy, enhanced self-esteem and sometimes the reframing of past poor self-identity schemas into more positive identity constructions (Djurichkovic, 2011).

Cognitive Dissonance Theory (CDT) (Tavris & Aronson, 2007) offers an explanation for this change in identity construction because it asserts that an individual cannot simultaneously hold two competing notions of self – in short, one cannot be both ‘bad’ and ‘good’ at something at the same time. In the case of the Arts, CDT is a powerful phenomenon because it counteracts notions of innate superior ability (albeit assuming the necessary infrastructure and educational personnel) as skills mastery, agility in ideas generation fluency and flexibility, original outcomes/creative capital over time replace earlier ideations/beliefs of being unskilled (Giles, Paris & Whale, 2016). Djurichkovic’s (2011) review of the literature pertaining to art education programs in Australian correctional facilities, provided striking examples of this kind of CDT disequilibrium noting that despite frequent incidences of poor self-worth, prisoners involved in arts education programs often experienced benefits that positively impacted and changed their levels of self-esteem and self-efficacy through, “practical and psychological benefits that strengthened cognitive abilities and helped students integrate knowledge, feelings and manual skill” (Djurichkovic, 2011, p. 11).

The Arts and the Community

When undertaken with others as part of a shared creative endeavour, arts activities provide the individual with opportunities for social interaction, emotional connection and a sense of belonging. These benefits accrue from participants working together to learn new skills and through supporting one-another to achieve the desired arts outcomes. In the best collaborative settings the success of each individual is viewed and valued as a critical component of the success of the group, and participants interact and support one-another within a shared creative purpose framework. Djurichkovic (2011) provided a poignant illustration of the benefits afforded individuals involved in collaborative arts endeavours through her case study of inmates involved in one Australian prison art education program, noting that prisoners reported:

... the group created a sense of belonging and it didn't matter where we were from and/or what we had done; ...working with an artist who saw our usually negative experiences as positive fodder for art; and working with someone from the 'outside' to create a link to the 'outside' world. (p. 21)

Beyond prison settings and within disenfranchised community contexts (for example, in impoverished suburbs within or on the outskirts of many international cities) the arts are regularly used to bring people together to overcome social isolation and to foster inclusion. Whilst schools are obviously not prisons, nor even large communities, like both entities they have among their members, people who are isolated, excluded and disenfranchised – individually or institutionally cut off from the opportunities to achieve to a level commensurate with ability. Bynner (n. d) noted:

In recent years the idea of “social exclusion” has taken this kind of conceptualisation further ... it also brought with it rights of access enshrined in equal opportunities legislation and a whole range of initiatives to match educational provision to the needs of the individual child. (p. 3)

Within the context of this ‘evolution in understanding’, UNESCO (2017), in its focus on education, describes exclusion from meaningful education experiences as a human rights issue and presents examples such as:

...teaching and learning process not meeting the learning needs of the learner; teaching and learning process not corresponding to the learning styles of the learner; the language of instruction and learning materials is not comprehensible; learner goes through negative and discouraging experiences at school or in the programme, e.g., discrimination, prejudice, bullying, violence. (para. 4)

The arts in education offer a solution to persistent exclusion for many children because engagement with the arts, replaces isolation with collaboration and foster positive relationships within a community of creative practitioners. Kinder & Harland (2004) observed:

In terms of social inclusion, arts outcomes appear to be strongly associated with the therapeutic outcomes of enjoyment, psychological wellbeing, and also interpersonal skills/relationship development along with increased awareness of cultural and moral issues... the arts have the potential to offer cultural, educational and even economic inclusion ... this may, in part, explain the impact made by contemporary artists working in education settings, both formal and informal. (p. 53)

Understanding Inclusion

Inclusion assumes the equal right to access to resources such as infrastructure resources, learning programs, teaching and learning strategies and even teacher expertise (Mitchell, 2014). Support for the child with special needs is individual and includes modifications, substitution, omission and or removal of any barriers that inhibit the child from achieving their learning outcomes in a regular classroom (Foreman & Arthur-Kelly, 2015; Mitchell, 2014). With the passing of the Disability Discrimination Act 1992 (DDA), it was understood that children with a disability and or additional need, which significantly impacted on their learning outcomes would be given full access to an appropriate education, and could not be discriminated against in the education system, and that education providers would need to ensure that all children would be provided with opportunities allowing them to achieve to a level commensurate with ability. The DDA also provided the schools with support through the Australian Disability Standards for Education (2005) which assist all educational settings and educators with understanding the challenges with enrolment, participation, curriculum, student support services and elimination of harassment and victimization (Australian Disability Standards for Education, 2005).

Pre-service teachers’ views about inclusion in regular classrooms

The challenges faced by teachers in creating and maintaining an inclusive educational setting stem from developing individual educational plans, modifying, omitting, substituting and differentiating the learning outcomes to meet the needs of the children with a range of disabilities and special learning needs (Foreman & Arthur-Kelly, 2015; Mitchell, 2014; Yasar & Cronin, 2014). Such challenges include the lack of professional development as it relates to the wide range of specialized training, understanding the social, emotional and behavioral needs of children, class size, making changes to existing curricula, competing expectations of various stakeholders, and the availability of resources to support the children in their educational settings (Chakraborti-Ghosh, Orellana & Jones, 2014; Chong, Moore, Nonis, Tan & Wee, 2012; Hunter-Johnson, Newton & Cambridge-Johnson, 2014; Nonis, 2006; Nonis & Tan, 2011; Nonis, Chong, Moore, Tan & Koh, 2016; Odongo & Davidson, 2016).

Chong et al., (2012) and Nonis et al., (2016) reported that teachers in early childhood settings (Peoples Community Foundation, PCF) in Singapore felt that children with developmental needs

should receive the same service as other children. However, the authors highlighted the teachers' concerns about the lack of training and or expertise where classroom strategies would be required when working with children with different developmental needs (Nonis et al., 2016). A study by Odongo and Davidson (2016), which included information from preschool principals, teachers and learning support educators, reported that both special and general education teachers were positive towards idea of inclusion. However, the study noted that teachers were most concerned about not having enough time to meet the educational needs of students with disabilities in inclusive classrooms. The authors were also concerned about the quality of training required to meet the needs of children with disabilities in inclusive settings (Odongo & Davidson, 2016).

Chakraborti-Ghosh et al., (2014) reported that while Brazilian teachers' perceptions of inclusive education was positive, when asked if students should be included in regular classrooms, regardless of severity, the authors reported a slight difference of opinion from private and public school teachers. Specifically, teachers in the public school expressed slight disagreement to the statement compared with private school teachers who expressed slight agreement. The authors reported that the Brazilian teachers in their study believed that inclusion benefits students' academic skills. Importantly the study reported that both American and Brazilian teachers agreed that students with mild and moderate disabilities could benefit from being educated in regular classrooms. However, only Brazilian teachers in the private schools agreed that students with severe and profound disabilities could benefit from inclusive educational settings (Chakraborti-Ghosh et al., 2014).

The aim of the current study was to investigate PST perceptions about inclusive practices. In addition, the study looked at the interplay between perception and practice for PSTs during school experience and whether the university's on-campus teaching was adequate in preparing the PSTs to work with students with special needs in regular schools. The focus group in this study were secondary arts PSTs and post graduate students who had already completed an arts degree and who were considering a career as arts specialist (secondary) teachers. The study also investigated whether positive impacts associated with an existing AiR program (discussed later in this paper) might be utilised as a platform by which to investigate PST preparedness to meet inclusion obligations. The study's research questions were:

1. Can PST engagement with mentors beyond the usual practicum settings complement on-campus studies and enhance sensitivity to special needs and inclusive education agenda – i.e., capacity to *see* student needs?
2. Can involvement in an arts based residency (AiR Program) enhance PST preparedness to meet inclusive education obligations – i.e., improve the capacity to *act* to meet student needs?

Methodological Framework

The research was contextualised within an existing university facilitated AiR program, which had operated in Western Australia since 2007. In this program visual arts and arts education university students worked on a voluntary basis in schools on a special arts project. The work undertaken in the program is a collaboration between the AiR, teacher-host, and children, and the program is annually advertised to schools as 'an opportunity to have an experienced artist facilitate a special collaborative arts project that would not normally be possible within the school setting'. Since 2007 over 200 arts residencies have been completed in both non-government and government school sectors.

Several examples of typical residency projects follow to provide the reader with an understanding of the AiR program and a context for the research (see images one to four below).

Images One and Two***AiR project exemplars - ceramic sculpture mosaic (nature play garden) and mural***

NB: images one and two reproduced with the permission of the AiR school-teacher host

Teacher Host Feedback: "The (AiR) mosaic was extremely inclusive. The technique was kept simple but effective which meant even the students who struggled in Art were able to feel successful and were proud to visit the mosaic and show off their work. I have often seen students searching for their work and showing it off to their friends while playing at break times. Hearing some of the extremely engaged questions asked by the students, to the mural artist, made me realise that this exposure opened many students' eyes to the possibility of a career in the arts."

Images Three and Four***AiR Project Exemplars - Large Scale Dreamtime mural***

NB: images three and four reproduced with the permission of the AiR school-teacher host

Teacher Host Feedback: "We loved being able to participate in the AiR program and our students benefited greatly by having a dedicated artist at the school. Everyone is extremely proud of the mural that was completed. Being a 100% Indigenous population District High School our students can be very difficult to engage and this program was a huge success as they do like to have visitors in the school. ... the students loved this and were totally engaged. The experience was very inclusive. The students very quickly took ownership of the project and were very proud of their achievement. They learnt that having a go was more important than having to get things right and perfect every time. All students that started the

project worked through to the end and helped with every aspect including cleaning up materials and area".

Residencies 2016

Early in 2016, expressions of interest were sought from schools in Western Australia wishing to host an AiR program and by March, 2016, 25 placements (24 primary schools and one secondary school) were confirmed. The host teachers were advised that inclusion and diversity would be the underpinning theme for the residencies and they were asked to offer the PST-AiRs guidance in implementing inclusive practice.

As in previous years, the 2016 residencies ran across the 10 weeks of the third school term (i.e., July – August) with the majority having a duration of around five weeks (a total of approximately 15 – 20 hours duration). The AiRs and host teachers shared the progress of their placements in a closed-access online learning community (FB-OLC). This approach had previously been used with great success by the researchers to support PSTs during periods they were working in schools and away from the university (Paris, Boston & Morris 2015).

Without exception the projects were considered successful in producing quality substantive arts works and the feedback/testimonials collected from AiRs and host teachers suggested that the residencies made an important contribution to the school and also to pre-service teachers' professional development. One AiR commented:

"The AiR program was similar to a condensed practicum placement, as I was able to develop my teaching skills through working so closely with students. I was also able to build relationships with other art teachers and the wider school community... I have come away from the AiR program a better teacher, with an expanded network and some wonderful resources plus samples to take with me to my future classrooms." (2016, PST-AiR)

The interviews

While this research is primarily a phenomenological study, it employs both quantitative and qualitative research methods. It makes effective use of both interviews and questionnaires to elicit an enhanced breadth and depth of response. Forsey (2012, p. 364) suggests that, "interviews work best when used as part of a suite of approaches applied to knowledge generation." In this research, a combination of qualitative and quantitative data collection and analysis was employed in order to strengthen the findings and improve the richness of the final product. Creswell (1998) suggests the ideal interview cohort to be between five and 25 subjects, while Morse (1994) suggests at least six interviewees makes a suitable sample size. In this study, ten of the 25 AiR Program participants agreed to be interviewed and data was obtained from nine host teachers supporting the PSTs.

In this research project, the interviewer used a combination of semi structured and open ended techniques to gather data, and importantly, to identify and then focus on ideas which were not initially expected, but which were considered to be potentially significant. Recording by video and sound (using iPad2) allowed the researcher to effectively and accurately assess and interpret the data. The researchers were able to cross reference comments made in different stages of the interview and this allowed them to identify conflicts and to corroborate ideas and perspectives in ways which might not be possible in surveys, questionnaires and when simply observing interactions. Data from this research project were analysed both deductively and inductively. Thomas (2006) describes inductive qualitative analysis as an approach whereby the researcher uses detailed analysis of raw data to identify and develop emerging themes (or concepts or models). Interviews were reviewed and the data thematically coded by the

researchers. This deductive element of the analysis resulted in several subsets of data being available for further inductive analysis, which, in turn, allowed the researchers to develop descriptions of patterns and themes in the data, based on type, frequency and emphasis of PST responses.

Data obtained in different interviews were compared and contrasted (via cross-case analysis), and within each interview, a form of constant comparison was used to interpret observations. This process allowed the researchers to identify patterns and themes as well as anomalous evidence. This inherently flexible approach to reviewing the data allowed the researchers to identify new threads in conversations which at times led the research in new and important directions. As the process continued, the relatively unstructured and disorganised data took on an organised and meaningful structure – and so, allowed the researchers to identify shared and emergent themes and unique or unexpected responses. This occurred with a view to developing an understanding of the strengths and weaknesses of teacher training programs – as they relate to informing inclusive educational practices for those children with a wide range of minor, and more significant, special educational needs.

The initial data reduction, analysis and review of AiR surveys/interviews informed the decision to seek further corroborating data. It was deemed important to confirm the actual numbers and profiles of identified special needs students in the AiR projects since the AiRs reported in their interviews their belief that there were few if any special needs students involved the residencies. Host teachers were contacted and asked to identify the types and numbers of students with special learning needs, who were present in the host classes. A “Special Needs Profiling Checklist” was created and sent to the host teachers at the participating schools (see Table 1). In order to get a general sense of the range and numbers of various special needs which might typically be present in mainstream Australian classrooms, host teachers were only required to tick a checklist identifying specific special needs and to indicate how many children with the special need there might be in the classroom/s.

Method

The combination of perceptual surveys, reflective interviews, and special needs (SN) demographic data collected from the school hosts (confirming the number and type of SN students in the AiR project groups) provided the authors some insight into the adequacy of pre-service training as a precursor to the PSTs working with students within an inclusive and collaborative arts context. It is relevant to note here that the Graduate Diploma Education (GDE) PST-AiRs had all completed formal studies in inclusion philosophy, education practice and their AITSL obligations in the first semester of their teacher education degree, whereas the BA-AiRs had not.

Participants

Purposeful sampling was selected for the research. The participants were comprised of the following:

1. Cohort 1 (PST-AiR) – Six (6) PSTs enrolled in a Graduate Diploma Education (GDE) at two Perth Universities with a major in an arts subject (i.e., visual arts, media, or drama studies) – all of whom had been invited to participate in an AiR placement.
2. Cohort 2 (BA-AiR) – Four (4) 3rd year visual arts students enrolled in a Bachelor of Arts (Fine Arts) who had expressed interest in teaching and were in the process of entering the Graduate Diploma Education in 2017.
3. Cohort 3 (host teachers) – Ten (10) Primary generalist teachers who mentored the

AiRs in working with the students and hosted the AiR projects at their school.

Questionnaire and Interview Instruments

The instruments were administered over the 12 month period of March, 2016 to April, 2017. The research instruments comprised:

1. An online Qualtrics quantitative pre-test questionnaire completed by prospective AiRs, comprising both demographic data questions and perceptual questions aligned to attitudes towards special needs education and inclusion. Participants were asked to rate 18 special needs inclusion perception statements on a five point Likert scale. Ten of the respondents indicated that they had some past experience (one to two years) working or volunteering with people with special needs. Ten of the survey respondents went on to complete an AiR placement and were interviewed about their experience (see Table 1).
2. An interview schedule comprising 10 questions about the completed AiR placements and inclusive education experience in the residencies (see Appendix 1).
3. A post AiR Program survey completed by the host teachers (see Table 2).

Results and Discussion

Online pre-test survey – prospective AiRs

Seventeen surveys comprise the data. Eighty-three percent of respondents identified themselves as Western Australian with 17% indicating they were international students. Respondents were aged from 20 to 60 years with the majority in them in their 20s and 30s. Four males and 13 females completed the questionnaire. Thirteen were enrolled in a Graduate Diploma of Education (arts education) and four were completing a Bachelor Fine Arts. All respondents indicated that they had completed a range of undergraduate and post graduate studies in arts and all had some industry experience working professionally in the arts industry. Ten of the respondents indicated that they had some experience (one to two years) working with people with special needs. All respondents expressed interest in participating in the 2016 Artist in Residence Program. Ten of the survey respondents went on to complete an AiR placement and were interviewed about their experience.

Overall, the results of the first survey indicate that PSTs had positive attitudes about the concept of inclusion as a whole and about including children with special needs into regular classrooms. For example, PSTs felt that children with special needs have the right and should be included in regular classrooms alongside their peers (100% and 94% respectively, see Table 1). In addition, all PSTs were of the opinion that Inclusion was a good idea. This is a promising affirmative statement that PSTs were supportive of the DDA (1992). While PSTs were supportive of Inclusion in regular schools, some 76% felt that they were not entirely responsible for teaching children with special needs. The cohort responded to the statement “Special education teachers have the primary responsibility for the education of students with special needs” (see Table 1).

In addition, the PSTs overall responded with positive responses supporting inclusive practices in schools as they felt that it not only benefitted the child with special needs but their peers (82% and 88% respectively; see Table 1). It appears from the responses PSTs in this cohort did not deny that there were challenges (82%). The benefits of implementing inclusion in classrooms outweigh the challenges but still supported inclusion in schools. The responses about inclusion correspond with other research supporting inclusion in regular classrooms (Chakraborti-Ghosh et al., 2014; Nonis et al., 2016). In addition, only 18% responded that they would not prefer to teach in a class with children with special needs. The results showed that PSTs were of the opinion that most children with special needs were well behaved in classrooms (68%) although some 41% responded that the challenges could potentially escalate if a teacher had a

class of children with “mixed” special needs (see Table 1). In terms of training and knowledge about special needs, 71% of the participants responded that they were aware that there was a lack in their knowledge in understanding special needs, a similar concern relating to training in Odongo & Davidson’s study (2016). Furthermore, 29% responded that teachers were not equipped to meet the individual special needs of children in regular classrooms. While the cohort for this study is relatively small, this result suggests training in inclusive education must continue to be a core unit at any undergraduate course for PSTs. It is recommended that a further study is warranted to verify the PST training requirements in the area of special needs education.

While the PSTs in this study were supportive of the idea of inclusion they also expressed some interesting responses about integration for children with special needs in their classrooms. For example, 24% of PSTs responded that students with special needs should not stay in the regular classroom for the entire school day. In addition, the 24% of participants responded that believed that they would need to spend more time with children with special needs and therefore may have less time for the other children in the class (24% and 35% respectively, see Table 1). Furthermore, some 18% of respondents agreed that inclusion “is not a desirable practice in a regular classroom” (see Table 1).

In summary, there was a general sense that PSTs were supportive of the idea of inclusion of children with special needs in mainstream classrooms. The results also revealed that PSTs felt that teachers were not equipped with the necessary knowledge to work with children with special needs and that the challenges would potentially be increased if a teacher had a classroom of children with different special needs.

Table 1. Pre-service Arts Teachers’ Perceptions of Inclusive Practice (N= 17).

Percentage Agreement	Perception Statements
94%	Students with special needs have the right to receive their education in the same classroom as typically developing students
100%	Students with special needs should be given every opportunity to learn in an inclusive classroom.
65%	Most students with special needs are well behaved in inclusive classrooms.
88%	It is a valuable experience for all students to be educated in inclusive classrooms.
94%	Inclusion provides learning opportunities for students both with and without special needs.
82%	The benefits of implementing inclusion in classrooms outweigh the challenges.
100%	Inclusion is a good idea.
71%	Most teachers lack an appropriate knowledge base to educate students with special needs.
18%	Inclusion is not a desirable practice in a regular classroom.
24%	Students with special needs should not stay in the regular classroom for the entire school day.
29%	Students with special needs will have their education needs more effectively met in special education settings than in regular classrooms.
29%	Teachers who teach in regular classrooms are not equipped to meet the individual needs of children with special needs.
76%	Special Education Teachers have the primary responsibility for the education of students with special needs.
41%	It is difficult to maintain order in a classroom that has a mix of students with special needs and their typically developing peers.

24%	Students with special needs lose the specialised services they need as a result of inclusion.
24%	Teachers pay more attention to students with special needs than their typically developing peers in inclusive classrooms.
18%	I would prefer not to teach students with special needs in a regular classroom.
35%	I have less time for typically developing students when students with special needs are included in my classroom.

Emergent Themes from the Interviews

The emergent themes from the interview data were concerning. The PSTs and their host teachers knew that this project was about ‘inclusivity’ i.e., about identifying and supporting children with special needs in a mainstream context. The general findings indicated that the PSTs (as a group) believed that there were no (or very few) students with special educational needs in their project groups. Several of the PSTs in the cohort indicated that though they knew there were children with special needs in their group, they did not appear to have much specific information about numbers or needs. The reasons for this appeared to be a consequence of both lack of personal insight (the PSTs did not look for children who may have had special needs), and the fact that (according to the PSTs) few mentor teachers made any mention of special needs students or discussed the need for the PSTs to adopt an inclusive approach to teaching.

As a consequence of their initial understanding, it appeared that few of the PSTs made any adjustments to their teaching, and some made no adjustments at all. By ‘adjustments’, the researchers are referring broadly to the provision of curriculum differentiation designed to create an inclusive classroom. The broader category of special needs as understood in this context was taken to encompass as much as one third of each classroom. The classes in which the PSTs worked as AiRs, although limited in number, did represent a cross section of schools in terms of SES, Sector (Government, Catholic and Independent), size, and age of students (early childhood to secondary), so, were deemed ‘typical’ (see Appendix 1).

The following remarks by four of the ten AiR participants exemplify the interview data we collected. Each AiR was first asked to explain their understanding of the terms ‘special needs’ and ‘inclusion’ before describing the role of these concepts in their placements:

AiR #1 interview extract: BA-AiR at School #1 on Table 2 (at least 11 students with special needs)

“Special needs students are those who have difficulty learning. I had three classes (years 1, 2 and 6) working on this project and the students were allowed to decide if they wanted to be directly involved in the mural or not ... the whole class was there every time I was there and the ones who wanted to be involved on the day could be, or they could watch ... no, there were no special needs students in the project.”

AiR #2 interview extract: PST-AiR at School #4 on Table 2 (at least 11 students with special needs)

“Special needs ... for me personally, I would say that’s anyone who is experiencing learning difficulties - so that could be a diagnosed disorder or it could be a person with issues or distractions from anything happening in their life. Yes, there was one student that the host told me about. She said “he’s great - you’re not going to encounter any problems with him”. She said “he is on the ASD spectrum”. I would not have known he was on the ASD spectrum had I not been told. The mentor said he was “high functioning and highly intelligent”. No, she

provided no advice on how to work with him. No, I didn't need to do anything special with him."

AiR #3 interview extract: PST-AiR at School #8 on Table 2 (at least 26 students with special needs)

"Special needs ... it doesn't necessarily mean someone with a disability - to me it means someone who just requires a little help with their education, whether that's for physical reasons, cognitive reasons or just difficulties understanding. And also the ways they learn – not everybody is a visual, or tactile learner. Yes we had two or three (students) with hearing impairment. On my first day they hooked a microphone up to me, and I had no idea why, they forgot to tell me. I thought they were recording me for university. And then I looked around realised that a couple of kids had these little devices in their ear. After I asked (the host) she said "oh I forgot to tell you – it's so they can hear you, otherwise it's just muffled noise". No - no special instructions ... the mentor just said "whenever you're talking to the whole class make sure you have it (the lapel microphone) on, but when talking to them privately they won't need it". No, no others really ... um ... actually, there was one other student who was a bit isolated – he wasn't diagnosed with anything but I had the feeling there was something going on with him. I did ask the teacher but she said he was just a bit day-dreamy. No, I didn't do anything about it."

AiR #4 interview extract: PST-AiR at School #5 on Table 2 (at least 17 students with special needs)

"Special needs ... I suppose special needs are not necessarily one thing or another. I guess it's a range of students who could have learning difficulties or disabilities and require some form of differentiation in the teaching. I guess I had some students who were a bit disengaged with low self-efficacy. I think some may have had self-comparison issues – a low view of what thought they could achieve. This was a high ability group so maybe they (the SNs students) were screened out. The host did say that the whole class needed praise – but it wasn't specific to any particular child. I think the project itself fostered inclusion ... they had choice ... we used natural objects they (the students) brought in, and scanned in the photographs they took for the stop motion samples which were then combined into one long film ... it was an 8/10 for quality ... and collaboration was a really important aspect. I'd say it was an 8/10 for collaboration and an 8/10 for inclusion."

Host Teachers' Survey Responses

All host teachers reported that there were at least seven students (see Table 2) having special needs in each project cohort (of one or more classes) being supported by the PST-AiR. Conversely, most PST-AiRs indicated that there were few, or no, students with special needs in their classes. Six of the 10 AiRs were in the final semester of their teacher education training and had explicit exposure to inclusion pedagogy within both general education and also arts education contexts. It is perplexing therefore that none of the simple accommodations to which they had been introduced during coursework training were implemented in the AiR Projects. Our analysis of results suggests as previously stated that rather than not knowing *what to do*, our PST-AiRs were simply unaware that there were students in their project groups who needed this intervention support. The failure to 'see/investigate' translated to 'failure to act' and therefore a 'failure to accommodate' students' needs. Accordingly, inclusion cannot be claimed as the by-product of host teacher/AiR action in this study.

Table 2. Numbers and Types of Special Needs Students in AiR Project Classrooms

Identified special needs School Sites:	AiR classrooms (#1 – #10): numbers of students with special needs									
	#1	#2	--	#4	#5	#6	#7	#8	#9	#10
ADHD	2	2		1				2	2	
Autism Spectrum Disorder	2	2		1				1		
Cultural differences	1			2		14		6	many	1
Depression / anxiety	1	yes			1			4		
EALD		2				14	5	2	many	3
Gifted	1			6	16		5	4		
Hearing impairment								2		
Learning disability	1	2								
Physical disability – other									1	
Very low ability	1	3				1	3	5		3
Vision impairment	2								1	

Transferability

There are obvious impediments to claims of transferability of our findings (i.e., that PST inclusion training did not transfer to PST teaching practice in the host schools) as a consequence of the small scale and single learning area (arts) focus of our study, however, the potential scale of the problem, if the experiences we observed are replicated more broadly, deserves consideration. Each of our AiR participants was working in a school with one or more classes of between 20 and 30 students under the supervision of an experienced classroom teacher and the impacts of their inaction extend far beyond their own experience. Their failure to see-acknowledge and act-respond to the needs of students who fell outside the ‘typically developing’ profile is serious cause for concern (200- 300 primary aged students were impacted in this small study alone).

Our AiR participants’ pre-service training encompassed four years of coursework and practicum experience and there are elements of inclusion training in each year of study as well as two course units which explicitly address inclusion in general and arts education contexts. It is quite clear that our participants’ training did not transfer into their practice. What remains unclear in this study is the *impact* of that ‘failure to see - failure to act’ on the achieved inclusion outcomes. According to the PSTs and the host teachers, the AiR projects were collaborative and inclusive; every child in each group participated in the project; and the placements resulted in a high quality art product which met the expectations of the school. One hundred percent (all) of our participants suggested that the placements were inclusive settings notwithstanding that our research has revealed they did little or nothing to achieve that end. The matter of whether the placements were really inclusive requires further investigation in light of the failure of the AiRs to ‘see’ student needs. Reasonably then we must question their perception and ability to adequately evaluate and appraise the placements as inclusive.

A secondary source (whilst not formally evaluated) is provided by our host teachers who, in their email correspondence and also in comment on their confirmation surveys, indicated that the placements had been very inclusive. One host observed on her survey: “*residencies were very inclusive, with students involved in decision making and working collaboratively with the artists*”. Perhaps as Kinder & Harland (2004) suggested, there is something in the Arts experience itself which fosters inclusion, underscoring the value of arts in education – and especially, inclusive education. Alternatively perhaps the AiR program *structure*, which mandated a specific configuration in which the children worked collaboratively under the guidance of the artist and their regular classroom teacher on an arts idea they *jointly* developed, *jointly* executed, and *jointly* celebrated leading to *joint* ownership, was the trigger for inclusion outcomes. In this sense programs that formalise collaboration over a sustained period may in and of themselves foster conditions needed for inclusion. A combination of factors such as arts experiences (the project), arts and general education expertise (the teacher/artist) and formalised collaboration arrangements (the children working together) may explain the positive inclusion ratings our participants afforded the projects after completion.

These unresolved questions limit the transferability of our findings beyond the scope of this first inquiry, however there is good evidence that PST preparation is not meaningfully transferring from theory into practice and this is a worrying manifestation of the lived reality of some classrooms in Western Australia. Further research and ongoing inquiry are warranted.

Conclusions

The study revealed the following key conclusions:

1. There was little evidence of articulation of inclusion theory into practice in our participants’ work with students in the AiR projects despite the provision of formal training through PST course work and a request to focus on creating an inclusive environment in the project.
2. The schools sampled in the study reflected the anticipated broader composition of integrated classrooms evidenced in the literature and embodied in the legislation (i.e., the presence of special needs students in ‘typical’ classrooms). All of our school sites had students with special needs profiles integrated into mainstream settings.
3. That the provision of formal inclusion education as a routine part of course completion (i.e., for the Graduate Diploma Education AiRs) did not, in and of itself, appear to enhance the capacity of PST-AiRs to create or maintain an inclusive learning environment. The majority of the AiRs reported that there were few, if any, students with special needs in their project groups which when reconciled against the host surveys underscored a disconnect between perception and reality.
4. Despite *all* participants (hosts and AiRs) being asked to focus formally on inclusion as an underpinning theme for the placements, few accommodations were made for students with special needs, and (according to the PSTs) they were provided with little or no advice by hosts. The ‘failure to see’ special needs students has been interpreted as a related ‘failure to act’ to accommodate those needs. We believe the failure to ‘see and respond’ was compounded by the ‘absence of impetus’, consequence or requirement to act.
5. The absence of accommodation of special needs did not appear to diminish the quality of the AiR projects as inclusive settings – the perception of AiRs and some hosts was that all students appeared to be fully involved in the project outcomes. In this respect involvement in a shared arts activity appears to have provided the vehicle for inclusion irrespective of the actions of the host or AiR. This echoes Kinder &

Harland's (2004) observation that it is the Arts' experience itself that fosters inclusion rather than the actions of teachers who operate as secondary agents.

6. The quality of artworks produced in the placements was of a high calibre and the AiRs expressed the view that the placement had met their own, and the schools', expectations that the placement would result in a substantial high quality art product.
7. The majority of PSTs in the study were supportive of inclusion in the regular classrooms.

Recommendations

In this study the AiRs/PSTs demonstrated some awareness of the nature of inclusive education and most had touched on (or covered in more detail in their interviews) something about special needs education, yet almost nothing was done about it – either in terms of recognising the problem or in acting to modify the program (material and strategies). There were some implied low level adjustments made by some, yet little of substance. Despite these failures the very nature of the arts experience itself when undertaken with others appeared to translate into a positive and inclusive experience for all involved in the program. In other contexts where the discipline itself does not as easily foster inclusion through collaboration, much more is required of teachers in meeting AITSL responsibilities. Before action can be taken areas of need must be identified. More research is needed and despite much remaining unanswered, this study served as a reminder that perception and reality can co-exist in a state of disconnect, as exemplified in the observations of one of our AiRs who appeared to be unaware of the special needs of students in their AiR group:

“Teaching is a walk in the park – actually... it really is ... less intense, lots less stress. The hours are much easier. Dealing with beautiful students who are so eager to learn (most of them)...”

Reflecting on these findings, we accept that as teacher educators we have a major role to play in inclusive education practice improvement (both within and beyond the arts) and consider that in addition to further inquiry an appropriate first response may lie in making more explicit for our PST students, the expectation that *every* class will include special needs students and accordingly they have an overt obligation to investigate in order to ‘see’ and thereafter to ‘act’ to accommodate special needs. A first response framework might take its form from well accepted practice improvement settings such as action research which is already commonly used in Australian Schools. Action research is appropriate where an educational issue has an applied focus coupled with a participant desire for change in practice leading to improvement.

We hope in future iterations of our pre-service course work aligned to inclusion obligations, (as well as arts education specialisations) to impress upon our students the importance of a ‘First Principle’ response. In our own practice improvement response, the inclusion ‘First Principle’ we would advocate would take the form of an explicit direction to PSTs working in schools to always assume the presence of special needs students in every class and thereafter to routinely engage with mentors/colleagues to ‘investigate-see’, ‘implement-act’, ‘evaluate-reflect’ on needs within an adapted action research practice improvement cycle. The ‘First Principle’ mandate is intended as a bridge between inclusion theory and practice. With such a fundamental strategy in place in combination with further research and program consolidation, inclusion may follow.

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Appendix 1 - Interview Questions

<p><i>Q: "Could you please explain what you understand the term 'special needs' to mean?"</i></p> <p>Definitions ranged from limited to quite strong. Overall; reasonable, though basic, understandings were demonstrated by PSTs.</p>
<p><i>Q: "Were there any special needs children in your AiR placement project?"</i></p> <p>There was limited recognition that special needs children who are not obvious exist in most / all classrooms. No AiRs identified that they had identified or been told of more than three students with special needs in their classroom(s). None indicated that the issues were significant. Most indicated that the issues were very minor or that there were no issues. Two PSTs suggested that the 'evidence suggests' that some teachers may have selected particular students to join the program because they were not 'problems'. One class was identified as an English as a second language (ESL) class, and this was recognized as being "a little bit" of a special need.</p>
<p><i>Q: If special needs students were present in your project group, were you given any advice about how to work with special needs children by your placement host?</i></p> <p>Nine PSTs answered this question. Seven of the nine suggested that they were not given any specific advice at all. One was given general advice to use praise and positive reinforcement, and the other confirmed she was given some basic information and advice. No specific disability or special need was identified.</p>
<p><i>Q: Could you please explain what you understand the term "inclusion", as it pertains to arts education, to mean?</i></p> <p>Reasonable overall understanding by PSTs was indicated.... No PSTs made statements which could be considered 'wrong' or 'off track'. Some observations were limited. Some were stronger.</p>
<p><i>Q: Did your research into inclusion literature impact your approach to working with students on the AiR project?</i></p> <p>A range of responses was provided... Generally, those who identified that they had prior knowledge believed that this was valuable. Prior knowledge was gained from; Assignment research (2), general study during classes (4). However, those that indicated no prior knowledge through study (3), did not seem too concerned and seemed confident that they had coped with the requirements of the project. There was an apparent contradiction here, in that most of those indicating that they had done research or study, also indicated that they had no children with special needs in their classes and also indicated that they made no significant interventions.</p>
<p><i>Q: "Did your AiR placement host offer any guidance specifically about inclusion issues with respect to your AiR project?"</i></p> <p>No specific advice or support relating to inclusion was offered to the six students who responded to this question. Some limited general advice seen to be available as required. Some general advice about making sure everyone (students) was involved was given by some host teachers. There was a perception of all PSTs that inclusion was not really an issue.... that those identified as having special needs were catered for without special adjustments being made.</p>

Q: “Did you take any actions steps specifically to create an inclusive learning context?”

By the PSTs own admission, limited specific evidence of adjustments were made to ensure inclusion. Some indicated some minor adjustments had been made, however, no substantial strategies were employed by the PSTs. Some PSTs felt that by making it ‘easy’ for all, inclusion was occurring... There was no apparent awareness about how ‘making it easy’, might disadvantage the most able and motivated students.

Q: “Is there anything else you can share about inclusive practice or your AiR project?”

Q: “Can you share an interesting or important anecdote related to inclusion?”

Q: “Do you consider yourself to be more or less capable of meeting your professional inclusion responsibilities as a pre-service and continuing teacher as a result of this AiR experience?”

Responses to questions 8 – 10 were useful in terms of providing supplementary information about the AiR Program in general, but did not provide useful information pertinent to this research. Consequently, that information has not been included.

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Barriers to Parental/Family Participation in the Education of a Child with Disabilities in Kenya

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Abstract

In Kenya, the subject of parental participation has not received much attention in terms of research, and roles of parents in their children's education are not normally well defined (Njeru, 2015). Based on observations, reports and research, parental participation remains low especially in the rural areas. This paper will discuss the barriers to parental/family involvement in the education of a child with a disability and suggest possible steps towards empowering families of children with disabilities to take active roles in their education. This paper is expected to primarily benefit policy makers, parents and everyone on the frontline of implementation of special education laws and policies. It could also provide ammunition for advocacy groups and non-governmental organizations for spurring the government and the Ministry of Education into action that is tailored towards improving the education of children with disabilities in Kenya.

Keywords: *Special Needs Education, Disabilities, Inclusive Education, Community Based Programs, Special Schools & Integrated Units.*

Introduction

The guiding philosophy of education in Kenya is the concern that every Kenyan has an inalienable right to education regardless of ability or disability status. The vision of the Kenya government is to have “*a society in which all persons regardless of their disabilities and special needs achieve education to realize their full potential*” (Republic of Kenya: The National Special Needs Education Policy Framework, 2009, p.5). Special education is a vital tool for individuals with disabilities to realize their goals of equal opportunity, full participation in community life and economic self-sufficiency. In supporting the implementation of the Constitution of Kenya (Republic of Kenya, 2010), the Ministry of Education developed the Basic Education Act (Republic of Kenya, 2013). Articles 30 and 31 of this act spell out the duty of the parent or guardian of a person with a disability thus “every parent shall ensure his/her child attends public school which offers free and compulsory education” (Republic of Kenya 2013, p. 240). Further, the Ministry of Education adopted a national policy on special needs education in 2009. The Kenyan government is also a signatory to various international conventions and declarations such as Convention on the Rights of the Child (United Nations, 1989), World conference on Education for All (EFA (United Nations, 1990), World Conference on Special Needs Education (UNESCO, 1994), Dakar Forum for Action (United Nations, 2000), and the UN Convention on the Rights of Persons with Disabilities (2006). Additionally, the government has made a commitment to provide Universal Primary Education (UPE) by the year 2015. Children's right to basic education (including special needs education) is also provided in the Children's Act of 2001 (Republic of Kenya 2016).

Families of children/individuals with disabilities do not participate actively in the education of their children in Kenya especially so among the rural communities. Lack of parental/family participation in the education of a child with a disability is a major problem facing special education provision in Kenya (Abilla, 1988). Many parents of children with disabilities are unable to access vital services for their children due to stigma, poverty and a lack of useful knowledge of the existence of resources and services. Children with special needs are taken to school and left in the care of teachers who are overwhelmed by the large number of children in the classes, that they do not pay much attention to the child with disabilities. People with disabilities in Kenya like in many developing countries are a marginalized population and face problems as a result of their disability. Most have no access to education, health, employment or rehabilitation (African Child Policy Forum, 2011).

Research has repeatedly proven that parental participation in the education of their children plays a major role in their academic performance and general development (Emerson, Fear, Fox & Sanders, 2012). Children whose parents and families in general stay engaged in their education have been shown to perform better than those who do not receive such family support.

The barriers for those living with a disability and their parents/families are both physical and psycho-social. According to the State of Disabled People's Rights in Kenya Report (African Union of the Blind, 2007), the lives of people with disabilities in Kenya are marked by experiences of discrimination, prejudice and inequality. For children with disabilities, the obstacles include stigma which is still attached to disability, a lack of suitable transport to enable all children to make the journey each morning to the classroom, lack of appropriate technology and assistive devices to enable access to the curriculum, and a continued lack of resources, including adequately trained teaching staff. Early detection of disability efforts is still a challenge

as most parents seek help as the last resort. People living with disabilities face barriers ranging from discriminatory attitudes, abuse and violence and barriers to access that lead to segregation and exclusion in the family context, at work, school and in the society, where disability is often regarded as a burden and shameful (African Union of the Blind, 2007).

There are currently 1.3 million people living with a disability in Kenya (Republic of Kenya, 2008). Of this number only 39% and 9% have attended a regular primary school and high school respectively. The enrolment of learners in special institutions and units is currently 102,749 students. Out of this, 21,050 are in special schools while 81,649 are enrolled in integrated special units at both primary and secondary schools (Republic of Kenya, 2012). This enrollment figure represents about one third of the expected number of learners with special needs according to estimates.

Parental empowerment and inclusion in the education of their child with a disability is very important. For example, parents can provide very valuable prenatal, perinatal and postnatal history during the assessment process for a child with a disability. The Kenya National Special Needs Education Policy Framework (Republic of Kenya, 2009) identified a number of barriers to the education of children with disabilities/special needs. Some of the barriers identified in this document include issues related to access, equity, attitude, stigma, discrimination, cultural taboos and poverty (p.15). These issues create barriers to participation of parents in the education of their child with a disability. The barriers to active parent/family involvement are discussed in the section below.

Absence of strong special education laws/policies:

While there are many cases of initiatives by the Kenya government to include children with disabilities in education, a lack of clear legislation, policy, targets and plans tend to be major obstacles in efforts to provide education for all. The gaps in policy that are common in these efforts include a lack of financial and other targeted incentives for children with disabilities to attend school, and a lack of social protection and support services for children with disabilities and their families. The Kenya government introduced the Free Primary Education (FPE) in 2003. This move increased the enrollment from 5.9 million to 7.2 million (Republic of Kenya, 2009). This increased enrollment also meant that students with special needs had more access to schooling. The Kenya constitution of 2010 guaranteed people with disabilities the same rights and opportunities as their non-disabled peers (Republic of Kenya, 2010). However, the constitution does not guarantee equal access to inclusive schools and other infrastructure that support the education of children with disabilities. Kenya is also a signatory to many international committees and agreements such as the Convention on the Rights of Persons with Disabilities (United Nations, 2006), the Salamanca Statement (UNESCO, 1994), World declaration of Education for All (United Nations, 1990), and the Convention on the Rights of the Child (United Nations, 1989) among others. Despite the existence of domestic laws as well as the international commitments, more work is still required to drive the inclusion agenda.

Domestically, there is a lack of clarity in the inclusive education policy in Kenya (Adoyo & Odeny, 2015). For example, there is no “zero reject” requirement as part of the Kenyan law on inclusion, this means that parents may seek an inclusive education for their child, but the schools may still determine the child to be uneducable and decline to admit into the school. This situation may have the effect of discouraging the parents from seeking assessment and other special education related services. There can be no meaningful intervention or any effective mechanisms for the promotion and protection of the rights of children and people with disabilities in the

absence of sound policy and legislation out of which programs that empower and protect them can be developed. The Kenya government has provided a foundation for the promotion and protection of people with disabilities and their rights for inclusion in mainstream society but more work still needs to be done to bring the disability issues to the international standard. In the absence of specific laws and guidelines on their role, parents still remain marginalized by professionals. Most parents are unable to access the knowledge and skills that would facilitate their involvement in their child's education. The National Education Sector Support Program (Republic of Kenya, 2012) has increased the government's focus on access to education for learners with disabilities and special needs. However, there is still a big focus on special schools, special units and integrated classrooms with less emphasis on inclusive education with increased parental/family participation.

Negative attitudes and beliefs towards individuals with disabilities:

Beliefs and prejudices constitute barriers when the school, teachers and the community do not see the value of educating children with disabilities and when family members have low expectations of their children with disabilities. A good majority of people still believe that a disability is retribution for past wrong deeds committed (United Disabled Persons of Kenya, 2003). The low parent motivation to educate a child with disability is a major obstacle to active involvement by the parents. The main problems encountered by parents in educating their children with disabilities are stigmatization, negative attitudes from members of the society and parental ignorance (Mwangi & Orodho, 2014). Such a child is a shame to the whole family, hence their rejection by the family or the community. Children who are met by these beliefs and attitudes can hardly develop to their full potential. They get less attention, less stimulation, less education, less medical care, less upbringing and sometimes less nourishment than other children (Kenya Society for the Physically Handicapped, 1999). From a cultural point of view, therefore, there are many specific circumstances that have influenced the living conditions of persons with disabilities, including people's attitudes towards them. Ignorance, neglect, superstition and fear are social factors that have exacerbated isolation of persons with disabilities. Attitudes towards individuals with disabilities in Kenya, like in other East African countries have both positive and negative aspects and are often associated with beliefs about the causes of disability. Attitudes and cultural prejudices towards disability and persons with disabilities still continue to interfere with efforts aimed at educating children with disabilities (African Child Policy Forum, 2011).

Discrimination

Discrimination on the basis of disability is defined in the Convention on the Rights of Persons with Disabilities as any distinction, exclusion or restriction based on disability which has the purpose or effect of impairing or nullifying the recognition, enjoyment or exercise, on an equal basis, with others of all human rights (United Nations 2006). Discrimination may manifest itself in the form of cultural prejudice, socio-economic activities and practices, legislation and administrative practices as well as environments that are inaccessible to individuals with disabilities. Discrimination may result from stigma against a person with a disability, a family member or someone associated with a person with a disability (United Nations- DSPD, 2016). Stigma and discrimination may lead to persons with disabilities facing exclusion and dehumanizing treatment. For individuals with disabilities and their families, stigma can often result in diminished status in the society (United Nations, 2016).

Children with disabilities face extreme disparities and daunting challenges to the enjoyment of academic, social, and community participation. These forms of discrimination have the potential of keeping their parents away from actively getting involved in their education. Stigma can lead to discrimination against a person with a disability, a family member or someone associated with a person with a disability. As a result of stigma and discrimination, persons with disabilities may face exclusion and negative treatment in many aspects of their lives such as educational institutions.

Negative Societal Perceptions of disability and lack of knowledge and understanding of disability:

Despite sustained efforts by the Kenyan government and non-governmental organizations aimed at creating heightened awareness of disability, traditional and cultural beliefs still influence and shape people's beliefs and attitudes about disability. Societal influences and cultural beliefs interfere with identification of children with disabilities (Bruce & Venkatesh, 2014). Families may be reluctant to seek identification because they view disability as a curse from the gods or even as possession by the devil, leading to a sense of shame and concealment of the child with a disability (Kiare, 2004). Traditional beliefs that view disability as a curse or the result of witchcraft are still present as well as the belief that disability is contagious (Bii & Taylor, 2013). According to these the authors "*it is the fear of the unknown that seems to drive the negative perceptions of the community with regard to persons with disability*" (p. 30). The negative attitude towards disability in the communities is a significant barrier to parents' willingness to enroll their children with disabilities in school (Bi & Taylor, 2013). The fear of stigma and discrimination often means that parents would prefer to hide their child with disabilities indoors than to allow them to be seen and associated with the family. These harmful beliefs about disability are due to a lack of understanding and awareness of disability, misconceptions or social constructions concerning causes of disability, and reinforcement of prejudice. The traditional and cultural beliefs surrounding disability and inaccurate information fuel such beliefs.

Societal negative attitude has been cited as one of the major challenges to inclusive education in Kenya (Adoyo & Odeny, 2015). Negative perceptions in society can create feelings of shame among families who may keep their child with a disability away from public view. In some cases, children with disabilities are hidden away or forbidden from taking part in social activities due to stigma or negative perceptions. Sometimes children with disabilities are kept away from school. False and harmful beliefs about disability can have implications for all aspects of the lives of persons with disabilities and their families. Fear and ignorance about the nature of disabilities have had negative impact on the parents' ability to enroll their children with disabilities in the schools. The low motivation is partly due to the negative societal perspectives towards individuals with disabilities (Muchiri & Robertson, 2000). Mutua and Dimitrov (2012) found that parental expectations about social acceptance and their beliefs about the benefits of educating a child with disabilities influenced their decisions about school enrollment and participation. In some cases, due to cultural perceptions of disability in Kenya, and a lack of knowledge of available services, parents delay taking their children for evaluation and diagnosis. A late diagnosis and intervention significantly reduces the efficacy of these efforts.

High poverty levels

Poverty is a significant factor which impacts on parents' ability to send their children to school. Since 2003, the Kenya government has allowed for free primary education (FPE), but despite this, parents are still required to pay for uniforms, books, materials and other levies (Bii & Taylor, 2013). These costs are often out of reach for many families in low income areas such as rural communities and urban poor areas. Studies about poverty and disability show that the added costs of meeting the healthcare, rehabilitation and other needs of children can overburden family resources (Bii & Taylor, 2013). Parents of children with disabilities are challenged in their efforts to raise and educate their children. Poverty and disability strongly correlates, for example, poverty may increase the likelihood of a disability and may also be a consequence of disability. Poverty is considered as both a cause and consequence of disability and is one of the main barriers to education for children with disabilities in Kenya (Global Campaign for Education, 2015). Children with disabilities may have extra expenses associated with their education which includes the need for educational assessment, support and care, assistive technology, transportation and medical costs. The additional burden placed on families of children with disabilities exacerbates the impact of economic poverty. Parental beliefs about the potential benefits of schooling impact their decisions about assessment and school enrollment (Mutua & Dimitrov, 2012).

Effects of poverty on people with disabilities are enormous as poverty deprives them the basic necessities of life (Mukobe, 2013). Evidence shows that majority of individuals with disabilities and their families have inadequate or lack access to education, employment, health care, and other necessities of life such as reliable water, food and clothing which are a basic means of livelihood. Sending their children to school may require payment of school fees and extra affiliated costs such as books, uniform, transportation and meals at school.

Disability often affects families that are already poor, particularly those in remote rural locations. It takes a lot of persuasion to encourage such parents to participate in the activities related to the education of their child with a disability since they feel trapped in the vicious cycle of poverty. In some instances, geographical distance between schools and homes requires the parents of children with disabilities to take their children to school daily and pick them up at the end of the school day. Some parents have found this very cumbersome and as a result some of these parents have opted to keep their children at home to avoid the inconveniences (Mwangi & Orodho, 2014). Not only is the cost a barrier for children with disabilities but there is also the added concern by the parents about the safety of their child with a disability. It is also worth noting that in Kenya, scarce educational resources are allocated to those who are likely to benefit the most, for this reason, the views about disability influence referral, identification and school attendance for a child with a disability (Mukuria & Korir, 2006).

Limited/lack of knowledge of available services

A lack of access to useful and usable information has been cited as a major barrier to accessing services by individuals with disabilities and their families (Republic of Kenya, 2008). In some cases the parents of children with disabilities are not even aware of services available to their children or where to seek help (Kiarie, 2007). Some parents/families may feel intimidated by the school system and may not feel they have anything of value to contribute towards the education of their children with disabilities. Many parents of children with

disabilities, especially those in the rural communities often lack means of communication and mutual support system with other parents. Many parents do not know what choices are available for their children in either special schools or inclusive schools, or how to access services. They are often unaware of how to access educational services appropriate to the needs of their child with a disability, particularly in early intervention and early childhood education. Many parents have no or limited information about procedures for funding or personal support and do not know what pre-schools, primary/secondary or any of the post-school services can provide for the student. Many children with disabilities live in rural or remote areas, which limit their ability to access available services. Many services that are available are usually located in major population centers such as urban areas and cities. Children with disabilities living outside these centers have difficulty getting any services. Because of costs and lack of knowledge about available services, families from remote and rural areas may never access health care professionals and services for their children with disabilities.

Limited knowledge of disability types/categories:

Parents may not be formally educated, or may lack the knowledge, at the birth of their child, to help them cope with their difficulties. Parents may also not know how to access outside help to overcome these difficulties. Some parents have been found to be ignorant about their child's disability/special needs since they have not taken their children to the area assessment and placement centers. (Mwangi & Orodho, 2014). Many parents of children with disabilities do not know what to do or where to go if they notice their child is not developing normally (Bii & Taylor, 2013). For example, knowledge of autism spectrum disorder is relatively limited in many families. Most parents do not have adequate knowledge of autism or how it manifests itself. This incapability limits the success of intervention services due to a lack of follow up by the parents. In some cases, parents lack information on what to look out for as signs of disability during a child's developmental stages. As a consequence, impairments/disabilities are identified too late for any corrective measures to be successful. Community stigma surrounding disability means that parents are scared to reveal their child and to look for help. There is a lack of information available on the identification and rehabilitation services, this means that parents do not have access to information on the available services, what services are provided and how to access them for their children. Sometimes parents and teachers may also not have positive interactions related to the child with a disability.

Summary

Including a child with a disability in society begins with access to everyday experiences in the home setting with parents playing a major role. Unfortunately, most schools are not sufficiently collaborating with families and communities that they are serving. Partnership with parents/families is essential for effective and efficient delivery of quality education for children with disabilities. Parents of children with disabilities should be sensitized against cultural practices and beliefs that impact negatively on formal education of children with disabilities. Some parents are ill informed about who may be able to help their children with disabilities. New attitudes can be boosted through knowledge of disabilities and their causes. There is a great need to empower parents so that they can be actively involved in their child's education.

Suggested Solutions/Remedies

Advocacy groups/organizations

There is need to focus on addressing cultural barriers to inclusion and integration of people with disabilities in the society. The Kenya government should focus on developing and supporting information dissemination and advocacy programs. This will help in combating negative perceptions of disability within communities and help promote inclusive practices. The Kenya government must engage with political and community leaders to address the continued stigma faced by children with disabilities (Global Campaign for Education, 2015). The government and political leaders should work with disability advocacy groups such as the Kenya Disability Parliamentary Caucus so as to promote this agenda. Civil society, religious groups and community organizations should advocate for inclusion. Inclusive education is a relatively new concept that requires considerable community education and awareness creation. Professionals should begin to advocate more for children with disabilities and their parents. Educators and other professionals should assist families in identifying agencies and organizations that can support children with disabilities and their families.

Awareness/sensitization campaigns

Educating parents to increase their level of awareness of disabilities will not only reduce their anxiety associated with the care of the child with a disability, but will also increase the level of involvement in their education, care and interventions. There should be a renewed focus on increasing knowledge and understanding on disability issues. The Kenya Special Education Policy should include guidelines and information on disabilities and provide practical recommendations on how to include children with disabilities and their families in education. National campaigns on disability and inclusion should be part of government efforts. This can be done through the use of mass media to create awareness, to reduce negative attitudes and stigma and to improve the understanding of disability issues. Parents/caregivers need to be informed about available services for children /individuals with disabilities. The government should increase its efforts towards reaching out to parents of children with disabilities in the rural communities to orient them towards viewing the education of such children as a right of these children. They must take advantage of the opportunities offered by the government's mandatory system of free and compulsory education. Pre-schools, primary and secondary schools should provide information for parents about what resources are available locally, regionally and nationally for their children including the organizations that can help them. Parents and families should be educated about children with disabilities and their needs. This would have the effect of minimizing the feelings of self-blame, helplessness and loneliness. The roles of families, community leaders as well as the level of family involvement in the education of their children with disabilities should be clearly defined and anchored in the law. Community health and social workers should help in empowering parents. Parents of children with disabilities must be persuaded into viewing education as a right for their children.

Support for families of children with disabilities

The government should continue to recognize the important role of families of children with disabilities and the heavy responsibility and burden they carry. Supporting family members of children with disabilities in their own homes to become more confident, competent and knowledgeable about their child's development should be a top priority. Parents can be assisted through home visits by professionals from several backgrounds such as teachers, social workers or occupational therapists who work with them on prioritizing the developmental needs of the child with a disability. Funds should be made available to families in difficulty to help with fees, school levies, books, transportation and other associated costs. The nature of these supports should both be financial in addition to other capacity building and strengthening efforts. Social protection for children with disabilities and their families should be a priority.

The family of a child, young person, or adult with disability probably knows more about the student's abilities, deficits, learning style and personal characteristics than anyone else. Teachers need to encourage parent participation, to explain the processes and procedures more clearly to parents and to listen to parents far more. In developing curriculum plans and education goals, these issues very important for a student with disability than for students without, because they can be limiting or enabling factors which the educators would benefit from knowing about. Parents should be compelled to take their children for early assessment before they start school. Schools and community organizations should provide support to families of children with disabilities and to encourage them to send their children to school. They need to ensure that parents/families are fully involved in decisions about their children's schooling. A close relationship is needed in order for the school and the family to work in partnership for the sake of the child with disability. Families should be educated and informed on the rights of their children with disabilities to education and equal opportunities.

Establish and Strengthen Parent Groups:

In order to provide support to families of children with disabilities, parent groups should be encouraged with mentors to give support and advice to parents on how to access services, overcoming stigma and how to advocate for the rights of children with disabilities. Parents' organizations can have the potential of promoting positive attitudes towards children with disabilities as well as being advocates for change. The Kenya government with support from the non-governmental organizations and the donor community should support the establishment of parent groups in addition to other support systems for parents of children with disabilities and special needs. Parents' organizations can play a crucial role and should be strengthened so that children with disabilities are valued and supported by their families and communities. The Kenyan schools and school communities should encourage the development of parent clubs to promote the involvement of parents in the learning of their children. These involvements should include sports days, open days and other parent's days. School committee members and Parents Teachers Associations should include representatives from parents of children with disabilities either individually or as members of groups. The government should encourage and facilitate regular parents' meetings for purposes of providing peer to peer support as well sharing ideas for joint advocacy for the rights of their children. Parents should have a powerful role to play towards the inclusion of their children with disabilities in schools.

Policy on Special Education:

Kenya has put in place legislative and policy frameworks geared towards protecting and promoting the rights of people with disabilities. These documents and pieces of legislation should be translated into mandatory laws in regards to services and rights to individuals with disabilities. Children with disabilities and their families continue to struggle to access education and services that they need. There is need for a strengthened system of strong legal frameworks to be put in place to protect people with disabilities from discrimination. The Special Needs Education Policy, which addresses matters relating to institutional capacity and special needs of children and learners with diverse forms of disability, when fully implemented, is expected to improve the quality and access to education provided to children with special needs. The Ministry of Education should strengthen the education of children with special needs and aggressively move towards the development and implementation of a more inclusive education policy. Kenya has provided a foundation for the promotion and protection of people with disabilities, their rights for inclusion in mainstream society but more work still needs to be done to bring the disability issues to the international standards.

Strengthening Home and Community Based Programs:

The role of community-based organization/programs is to mobilize the community to ensure that negative attitudes and behaviors towards people with disabilities and their families change and that disability is mainstreamed across all development sectors. In many communities across Kenya, there are barriers which impact on the quality of life of people with disabilities and their family members. These include physical/environmental, attitudinal, cultural, system and policy barriers. It is important that community-based programs are able to identify and understand the barriers in the community which impact on people with disabilities and their families. A lot of progress will be made towards mainstreaming disability if community supports are built up and the different sectors of society become actively involved in the process of change. Community based programs can use community mobilization efforts to bring together stakeholders in the community, e.g. people with disabilities, family members, self-help groups, organizations for people with disabilities, community members, local authorities, local leaders, and policy-makers, to address barriers within the community and ensure the successful inclusion of people with disabilities and their families in their communities with equal rights and opportunities. It is also necessary to build strong partnerships between parents and professionals to ensure focused services for children with disabilities.

Increasing the capacity of Educational Assessment and Resource Centers (EARC):

The Educational Assessment and Resource Centers have been set up for early identification, assessment, intervention and placement of children and young people with special needs and disabilities. Investing in early intervention for children with disability before they get to school gives them the best chance of reaching their full potential. In Kenya, there are district based EARC involved in assessment and advice of the parents of children with disabilities. EARC's main objective is to equalize education opportunities for children with special needs and facilitate their full integration into the school system and their community. This approach includes early identification of children with special education needs, sensitization, counseling and training of children with disabilities and their families, parents, teachers, local administration and others in meeting the special needs of these children. Currently there are 200 operational

EARC's in Kenya (Bii & Taylor, 2013). The government should work towards setting up more EARC's and increasing their capacity to include parent guidance and counselling. Parents of children with special needs and disabilities require information and guidance on how to cope and train with their children's condition. Parents can be invited to visit these centers again after initial assessment. Staff from the centers should also be equipped with the capacity to reach out to the parents especially those in remote rural and inaccessible areas.

Conclusion

Children with disabilities are still underrepresented in the Kenyan education system in spite of the existence of legal frameworks to ensure access to education. More needs to be done towards implementing and enforcing these legal frameworks. A lot of effort should be expended on collection of accurate and up to date data on the number of children with disabilities in the school systems including transition and dropout rates. The lack of policy and proper funding compounded with cultural attitudes towards individuals with disabilities, have continued to hamper efforts towards addressing critical issues pertinent to those individuals with special needs in Kenya. The existing policies seem to be contradictory, due to lack of designated supervisory and implementation mechanisms. While Kenya government recognizes the need to educate all children, including those with exceptional needs, there seems to be a lack of mechanism for ensuring and overseeing that all students have equal access to education. While the government has put in place institutions such as schools, teacher training and special units geared to providing services to individuals with disabilities, it has not reached the point of utilizing the entire process of assessment that includes identification and referral, categorization, procedural safeguards and individualized plans. To effectively deal with disability issues in Kenya it is important to have accurate and up-to-date data on disability in order to establish the numbers, the type of disability and the general needs for purposes of including them in the planning system. Presently there is no accurate data on the number of persons with disabilities in Kenya (African Union of the Blind, 2007). Lack of data on children with disabilities both in and out of school makes it difficult to monitor progress and to measure the quality of educational outcomes of these children and their families. It is therefore important to establish accurate data for purposes of planning and service provision.

Recent international and national legislation has cast increasing light on the philosophy of inclusion and inclusive schooling. Grounded in UNESCO's education policy, adopted at the Salamanca Conference 1994 (UNESCO 1994), inclusive education is progressively being accepted as an effective means by which biased attitudes towards student with disabilities may be reduced. It is important to note that during the last decade, approaches to disability issues have changed from a medical model to a social approach with a current emphasis on a social model and human rights-based approach focusing on the removal of barriers created by the society. It is important to note that the Ministry of Education in collaboration with key stake holders has made a commitment to review the special needs policy every 5 years to ensure that the policy remains relevant to changing national and international environments (Republic of Kenya, 2009).

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Stress and Coping Strategies used by Special Education and General Classroom Teachers

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Abstract

This research was undertaken to shed light on sources of stress, effects and coping strategies used by general (mainstream) classroom teachers and special education teachers. A total of 139 teachers, from eight private schools in Beirut, Lebanon, were selected to participate in a study using the Pullis

Inventory of Teacher Stress (PITS). The teachers, 100 general classrooms and 39 special educators, were directly involved at one point in time in teaching students with special educational needs. The responses to the questionnaire items were analyzed using descriptive statistics and a correlation coefficient. Results showed that there was no significant difference between special education and general (and at times integrated) classroom teachers in relation to all sources and effects of stress. Moreover, Pearson's correlation coefficient (r) showed that most sources of stress had a weak-positive correlation with the coping strategies; yet most effects of stress had a weak-negative correlation with the coping strategies.

Keywords: *Coping Strategies, Mainstream or General Education, Special Education, Teacher Stress, causes and effects, levels of stress*

Introduction

Teaching is considered a demanding and challenging profession, given that teachers have a range of responsibilities: classroom management, lesson planning, class preparation, student evaluation and resource management. In addition, teachers are the focal center of interactions with parents, their own and other students, and other faculty members especially when teaching students with learning difficulties. Research suggests that special education teachers exhibit higher levels of stress than mainstream education teachers (Lazarus, 2006). Students with special needs require extra attention, resources and time compared to regular students. Therefore, special education teachers require more time to communicate class instructions. As in any institution, effective communication channels between executives and employees are of great importance. It is essential for administrative staff in any school to identify the causes of stress and be serious-minded in their search for coping strategies that will lower teachers' stress levels in order to attain a relaxing work environment. The recent economic meltdown has affected [the country] Lebanon negatively in all aspects. Teachers' salaries are considered relatively low compared to other professional sectors, so that increases in prices of everyday goods and services has made it more stressful and difficult for teachers to work with equanimity. Teachers may feel less driven to come to work every day knowing that an unrewarding salary barely meets their basic needs. Along with the effects of this prevailing economic situation, there are many other factors such as poor working conditions, scarcity of teaching aids, heavy workloads, and unacceptable student behavior.

The purpose of the present study is threefold: (a) to identify the main sources and effects of stress that both general/mainstream and special education teachers encounter while educating students with special needs, (b) to identify the major coping strategies that help to reduce the level of teachers' stress; and (c) to examine the correlation between sources of stress, its effects, and coping strategies used by general/mainstream and special education teachers here in Lebanon.

The significance of this research is that in identifying possible stressors, teachers can be aided in deciding which positive coping strategies best suit their psychological makeup. If stressors are properly identified and positive coping strategies are chosen and practiced with success consistently, teachers will attain a more stress-free, friendly, class environment. In this way, and according to some researchers (e.g. Guglielmi & Tatrow, 1998; Hepburn & Brown, 2001), more of their educational goals would be met.

Literature Review

Sources and Effects of Stress

Recent studies have revealed that teaching is becoming one of the occupations with higher stress levels (Engelbrecht, Oswald, Swart & Eloff, 2003). A study in Malaysia by Ghani, Ahmad and Ibrahim (2014), found that the workload and other sources of pressure caused moderate stress for the study participants. The findings also showed that there are no significant differences in terms of work-related stress among teachers based on gender, marital status, or highest academic qualification. Additionally, the study failed to establish any significant correlation between teacher stress and demographic factors such as age, length of teaching experience, and the respondents' monthly salary. According to previous studies in several countries, the causes of stress illness is more pointedly related to excessive teacher workload, higher pressure to finish within a limited time, large numbers of learners within the classroom and a growing number of students with behavioural problems among them (Kunkulol, Karia, Patel & David, 2013). Furthermore, a study demonstrated that teachers are exposed to burnout in at least six categories of stress, including work overload, lack of perceived success, frequency of direct contact with children, staff-child ratio, program structure, and responsibility for others (Johnson, 1990). Teaching is not an easy, straightforward job; it ranks as one of the most complex occupations. This very complexity makes it a demanding profession. Although job-related stress is a concern in all professions, studies in the last few years indicate that teaching has become one of the occupations tending to high stress

levels (Engelbrecht, et al., 2003).

Reports of high stress levels for special education teachers who teach special needs students within mainstream classroom settings are commonplace (Engelbrecht, et al., 2003). The findings of a study done by Platsidou (2010) imply that special education teachers' burnout and low job satisfaction that may emerge at some time in their career is likely to be preventable, if they are dealing with stress. In addition, the implementation of inclusive educational program is still not complete (Engelbrecht, et al., 2003). The findings of this study show that the large number of students with learning disabilities being integrated into classes brings additional challenges and stress to the general/mainstream education teachers. Such teachers will have increased workloads because they are required to modify every assessment depending on the individual special needs of every student. Teachers often need to re-explain a concept using different teaching strategies for different-abilities students to understand. Each term, teachers need to review the Individualized Educational Plan (IEP) of each student with special educational needs and assess it depending on their past behavioral and academic success. These stress factors also need to be considered concerning special education need teachers themselves who often experience time constraints. Both the special needs and the general/mainstream teachers find themselves under tremendous stress while responding to special needs learners and using the government-prescribed curriculum (Gyimah, Sugden & Pearson, 2008).

Effects of Stress

Stress leads to internal conflicts that differ drastically from one person to another (McGrath, Houghton & Norma, 1989). Employees experiencing constant work stress developed unstable blood pressure, increased cholesterol levels, muscle tensions, and numerous health problems. According to Brackenreed (2005), stress is an external condition or event that affects our body and mind negatively. Moreover, research of teachers' efficiency indicates that teachers' opinions, behavior and values affect the decisions they make and the way they interact with the teaching-learning process in class discussions.

Teachers' work satisfaction is significant since it influences teachers' performance and overall achievement and interest. The effects of job-related stress can be very serious and may include psychological problems, depression, low performance and motivation, absenteeism, or fatigue culminating in eventual resignation from the job. The outcomes of teachers' work-related

stress are serious and may lead to a high rate of employee turnover in schools. Teachers' stress is inescapable. Teachers who have good social, interpersonal, communicational skills and who can express their emotions and concerns to the highest organizational levels would enjoy better job satisfaction and a strong commitment towards their school (Klassen, 2010). A study by Chan, Chen and Chong (2010) found that elementary and middle school teachers tended to manage stress by relaxing, socializing with friends, and watching TV; while secondary school teachers showed a preference to engage in sports and extra exercises in order to maintain a healthy level of stress.

Coping Strategies for Stress

The teaching profession is a stressful career that affects the actions, decision-making, and general job satisfaction of those engaged in it. McGrath et al. (1989) posit that the results of previous studies show that among elementary teachers, those coping effectively with stress prefer to use active methods rather than passive. On the other hand, those elementary teachers who burnout from stress often can no longer be involved in enjoyable activities, and moreover have their own anger at this very situation compound the distress. Furthermore, teachers who work in low-stress environments engage in more extensive activities than those in a stressful atmosphere. Emphasis, therefore, on the teachers' internal locus of control was recommended in order to help in reducing the negative effects of stress (McGrath, et al., 1989). Teachers' stress can be better managed through school rules and administrative support, and a strong team approach by members of staff towards the development of well-rounded students. Previous researches suggest that teachers' collective efficacy could have a substantial, desirable effect on job contentment; yet there are very few studies examining teachers' collective efficacy and work place stress (Klassen, 2010).

Special needs and general classroom teachers can use several coping strategies to offset stress in school. Waltz (2016) explains that stressors cannot be removed from the teaching environment, which is why teachers should learn strategies and techniques to manage them and maintain teaching and personal effectiveness. Waltz proposes a simple ABC (Activating event, Beliefs, Consequences) stress management model comprising three steps for consideration: first, understanding the main causes of stress and its likely consequences; second, changing the behavior that leads to stress; third, improving teacher-student interaction and social interaction with parents and other school colleagues. Given that teaching is full of challenges, it is plain that

teachers (and administrators) should be proactive and initiate effective change strategies. A raft of strategies should be developed, including personal stress management, cognitive-behavioral techniques and ways to introduce flexibility into education.

Lebanese Educational System

In Lebanon, the education system in public schools is somehow different than those in private schools in both the French and English sectors. They mostly use governmental books that include the traditional curriculum, which prepares students for the usual official governmental exams (Vlaardingerbroek, Al-Hroub, Saab, 2017). Moreover, years ago, having a special education department at schools was very rare; but nowadays it has been acknowledged as a necessary entity of the educational program, especially in the private schools. There are a good number of private schools in both the English and French sectors that contain special education departments, yet they are working independently depending on the number and cases of students with special needs. As for the public schools, there are very few schools that include services for students with disabilities (Mattar, 2012).

The Current Study

Research Questions

Three key research questions will be the focus of the article: (a) What are the main causes and effects of stress experienced by general/mainstream and special education teachers? (b) What are the main coping strategies that help reduce the level of teachers' stress? and (c) What is the correlation between stress sources, effects and coping strategies used by special education teachers?

Research Design

A quantitative survey design was utilized in this study. A correlation design was used as the central means of examining the relationship between stress sources, their effects and teachers' coping strategies.

A two-part survey instrument was used for the purpose of this study. Demographic data, along with the Pullis Inventory of Teacher Stress (PITS) were used. The first part consists of the teachers' demographic data, which gives particular insight into teaching students with special educational needs. The second part contains two sections. Section one identifies factors

triggering teacher stress, its effects, and the coping strategies. In section two a Likert scale was used to measure and rank teachers' responses to the questions.

Method

Procedure and Participants

The sample for this study comprised 100 general /mainstream and 39 special education teachers, teaching grades one to six, in eight Anglophone private elementary schools in Beirut. The number of general education teachers exceeded the number of special needs educators because in most schools with special education departments, special educators teach several subjects not just one. A list of Anglophone private schools with a special education department was obtained from the Lebanese Ministry of Education and Higher Education (MEHE).

A purposive sampling method for selecting participants was used since the researchers used their own judgement when selecting the schools to participate in the study. The researchers also used random sampling to select a sample from a larger group. They selected schools that had special education departments or units; randomly chose eight schools that included a special education department; they then selected six elementary classrooms, one each from grades one to six. The selected subgroups in the sample were special needs educators and general/mainstream classroom educators with at least some experience with special needs students. The researchers randomly selected one teacher from each classroom who could be a homeroom teacher, or subject teacher (e.g. English, Arabic, Mathematics or Science). The participants were categorized as follows: 25 teachers selected from each school, 16-17 general classroom teachers and 8-9 special education teachers. A total number of 200 surveys were distributed, but only 139 teachers completed the surveys.

Survey Adaptation

Data were collected using a modified version of the Pullis Inventory of Teacher Stress (PITS). In addition, several questions designed to elicit demographic information were added to the PITS. To validate the survey, three Lebanese private school counsellors participated in modifying and adapting the PITS to the Lebanese context. The adaptation of the survey was a very important procedure designed to examine whether all items were clear, understandable, and valid with regard to teaching students with special educational needs in the Lebanese context. As a

result, several items were either modified or deleted in the PITS. To validate the use of the surveys in the Lebanese Anglophone private schools, the researcher sent the Demographic Data Form and the PITS survey to three private school counsellors.

Data Analysis

The responses to the questionnaire items were analyzed using descriptive statistics for each item on the questionnaire. Mean and standard deviations and independent t test were calculated.

Relying on previous studies, diagnostic cut-off scores were established to analyse the quantitative data (Al-Hroub, 2019, 2010; Tannir & Al-Hroub, 2013). In accordance with the original PITS survey, the researchers used three different Likert response scales in the three different parts of the survey.

Table 1. Three Different Likert Response Scales in the Three Parts of the Survey

PITS survey	Cut-off points	Indicators
Part I	$x \leq 2.5$	Mildly Stressful
	$2.5 < x < 3.5$	Moderately Stressful
	$x \geq 3.5$	Extremely Stressful
Part II	$x \leq 2.5$	Infrequently
	$2.5 < x < 4.5$	Frequently
	$x \geq 4.5$	Very Frequently
Part III	$x \leq 2$	Mildly Effective
	$2 < x < 3$	Moderately Effective
	$3 < x$	Extremely Effective

In order to answer the third research question, a correlation coefficient technique was used to find the Pearson coefficient correlation (r) between the causes and effects of stress and coping strategies. Interpretation of positive or negative correlations was used, especially for interpreting the strength of correlations as follows (Derby, Seo, Kazala, Chen, Lee & Kim, 2005).

Table 2. Interpretation of Positive or Negative Correlations Used

(r)	Strength of correlation
+0.30 to +0.39	moderate positive correlation

+0.20 to +0.29	weak positive correlation
+0.01 to +0.19 or from -0.01 to -0.19	no or negligible correlation
-0.30 to -0.39	moderately negative correlation
0.20 to -0.29	weak negative correlation

Results and Discussions

Summarizing, the independent *t*-test showed no significant differences between special needs and general classroom teachers in relation to all sources and effects of stress. Also, from the results, we observe that there were no specific sources of stress that were experienced as ‘extremely stressful’ for either general or special education teachers, since none of these sources had a mean value that was equal to, or above three and a half. Most sources of stress were ‘moderately stressful’. The five highest ‘moderately stressful’ sources were “Demands on after-school time” with ($M=3.44$), “Too much work to do” ($M=3.42$), “Students impolite or rude behavior” ($M=3.32$), “Not enough time allotted to do the work” ($M=2.31$), “Inadequate salary” ($M=3.28$). Only 5 out of the 30 causes of stress were rated as ‘mildly stressful’: “Participation in IEP (Individualized Educational Plan) meetings about students” ($M=2.02$), “Evaluation by principals or supervisors” ($M=2.20$), “Dealing with the parents of students” ($M=2.40$), “Being a teacher of students with special needs” ($M=2.42$), and “Attitudes and behavior of school principal or head of the special education department” ($M=2.45$).

From the results, it is noticeable that there were no effects that were experienced ‘very frequently’ by either general classroom or special education teachers who were teaching students with special needs, since none of them had a mean value that was equal to, or above four and a half. Yet, the five highest ‘frequently’ occurring effects of stress experienced by both types of teachers were “How often do you feel exhausted?” ($M= 3.72$), “How often does school stress affect other aspects of your life?” ($M=3.56$), “How often do you feel overwhelmed by your work?” ($M=3.41$), “How often do you feel frustrated” ($M=3.27$), and “How often do you have headaches?” ($M=3.07$). On the other hand, the highest ‘least frequently’ felt effects of stress were “How often do you feel distant from students with special needs?” ($M= 1.88$), and “How often do you feel like quitting teaching students with special educational needs?” ($M=1.94$).

In addition, the most effective coping strategies that teachers used when they felt stressed were “Organizing your time and setting priorities” ($M=3.51$) and “Doing relaxing activities

(hobby)” ($M=3.35$). However, the least effective coping strategies for both types of teachers were “Using substances or prescribed medication” ($M=1.29$) and “Smoking cigarettes” ($M=1.51$). Few teachers added any sources and effects of stress they encountered or coping strategies that they used which were not found in the lists presented in the survey; this depended on the teacher’s lifestyle. From the findings, we also concluded that there were no specific sources of stress that were extremely stressful for general classroom or special educators; while only 5 out of 30 causes of stress were mildly stressful, a full 25 were considered to be moderately stressful. Furthermore, while there were no specific effects of stress that occurred very frequently, 8 of the listed effects occurred infrequently, and another majority of 10 effects were experienced frequently. There were three ‘mildly effective’ coping strategies, five ‘moderately effective’ and seven ‘extremely effective’ coping strategies. Finally, after calculating Pearson’s correlation (r), we can conclude that most of the sources of stress had a weak positive correlation with the coping strategies, but most of the effects of stress had a weak negative correlation with the coping strategies.

Sources of Stress and its Ranking

Sources of stress can be classified into two groups: external and internal. Teachers need to be aware of these stress factors in order to work at changing some of these external and internal pressures societally (Burgees, 2000). We note here that in our questionnaire there were only two internal sources of stress “Inability to meet your personal or professional goals” and “Lack of fun or enjoyment involved in teaching”. External sources of stress either related to the school itself, namely its environment, staff and/or administration, or to other factors, mainly parents and students. While both “internal” sources were categorized as ‘moderate sources of stress’, the overwhelming majority (i.e. 28 out of 30) “external” sources fell into the moderate source of stress category. The top-ranking moderate sources were “Demands on after-school time” and “Too much work to do”. These results were consistent when looking at the combined mean scores of all the teachers, as well as the mean scores of the general classroom teachers. In the researchers’ opinion, the nature of the teaching profession (which usually requires post-class paperwork) and the added complexity arising from teaching special needs students were plausible reasons for the high rating of these sources by the majority of teachers. In fact, field experience has regularly shown that teachers miss breakfast or lunch in order to assess examinations, perform break duty, or attend meetings. These findings are in alignment with Brackenreed (2011) that for teachers, stress is a

reaction to negative causes associated with excessive workload. Likewise, previous studies have recognized that workplace stresses include excessive workload, limited time, lack of supportive opportunities, insufficient recognition and salary, being required to perform different tasks, and lack of resources (Gillespie et al., 2001).

However, referring to the mean scores of special education teachers only, results have shown that the most frequently encountered sources of stress are “Demands on after-school time” and “Inadequate disciplinary policy of the school”. While the former matches what we identified as the most common source of stress among all the teachers. Colligan and Higgins (2008) mentioned in their article that this can be traced to the fact that schools are not fully equipped in terms of resources and policies to handle special education students. Two teachers stated in the qualitative part of the survey that lack of classroom resources also led to stress. This actually confirms the results of Colligan and Higgins (2008).

Among the highly ranked moderate sources of stress were “Not enough time allotted to work” and “Inadequate salary”. Firestone (2014) mentioned that schools have clearly failed to establish a merit system that rewards the extra effort put in by teachers, leading to a feeling of frustration and demotivation. He added that external motivation theory relies on economics and extrinsic incentives and internal motivation uses psychology and intrinsic incentives (Firestone, 2014). Our results are also in tandem with the highly ranked internal source of stress “Inability to meet your personal or professional goals”. Thus, the absence of an effective reward system had translated into an internal source of stress for the majority of the teachers.

On the other hand, when looking at the combined mean scores, the mild sources of stress all fell into the “external” category and were evenly distributed among “School” and “Others”. For instance, “Participation of IEP meetings about students”, “Evaluation by principals or supervisors”, or “Dealing with parents of students”, were ranked as the least severe causes of stress since they involved tasks that were not as time-consuming as correcting examinations and which occurred on an occasional rather than daily basis.

Referring to the mean scores of special education teachers only, results showed that the least frequently encountered sources of stress were “Participation in IEP meetings about students” and “Lack of appreciation from your students”. Among the sources of stress that were mentioned twice in the qualitative part of the survey (which asked about other causes that the teachers encountered and were not found in the list), were “Lack of support at home” and “Parents’ denial”,

both of which fell into the category of “other” external sources, namely parent-teacher relationships. While the former matched what we identified as the least common among all teachers, the latter can be traced to particular attributes that are specific to the special education sector. For example, parents’ denial of their children’s special needs, students’ misunderstanding of the teacher’s role in class, and the common misconception that special education teachers are obliged to repeat the lecture over and over so that students might understand, are all fallacies attributed to the profession. These attributes often emanate from parents who usually communicate these misconceptions to their children. What parents discuss at home amid any lack of understanding about their children’s assessments leads to a “lack of appreciation” on the part of the students. McGrath and others (1989) mention that dealing with parents is really demanding and stressful for teachers. Furthermore, notable differences between general classroom and special education teachers were obvious. This shows that what might have been an important source of stress for general/mainstream teachers was not necessarily as important to special education teachers, and vice versa. The source “Lack of appreciation from your students” recorded a 0.77 difference between the mean scores in favor of special education teachers. Similarly, for the source of stress “Large number of students that result in lack of time to spend with individual kids,” the difference between the mean scores was 0.59 in favor of special education teachers. This difference may refer to the fact that the special education teachers were better equipped in terms of skills to tolerate the lack of appreciation from students. According to previous studies, the causes of stress are related to large class-sizes and the inability of teachers to deal with a large number of students exhibiting behavioral problems (Kunkulol et al., 2013).

On the other hand, some sources registered small differences in mean scores between the mainstream teachers and special education teachers who were teaching students with special needs. These sources were “Attitudes and behavior of other teachers/professionals” (mean score zero), and “Students' defiance of teacher authority” (with very low differences). This sheds light on the fact that despite the difference in skills between mainstream and special education teachers, some of the causes of stress were common in both categories and were therefore independent of the factor of special needs students. These causes of stress might therefore have been related to general professional challenges. There were five sources of stress that recorded a higher value among special education teachers when compared to the general/mainstream teachers. For example, “Lack of recognition of good teaching” and “Poor career opportunities”. Such causes of

stress shed light on professional challenges that are unique to special education teaching.

Table 3. Three Quantitative Indicators for the Sources of Stress

Mildly Stressful ($x \leq 2.5$)		Moderately Stressful ($2.5 < x < 3.5$)		Extremely Stressful ($x \geq 3.5$)	
Item	<i>M</i>	Item	<i>M</i>	Item	<i>M</i>
10. Attitudes and behavior of school principal or head of the special education department in school	2.45	19. Demands on after-school time	3.44		
1. In general, how stressful do you find being a teacher dealing with students with special needs?	2.42	9. Too much work to do	3.42		
16. Dealing with the parents of students	2.40	7. Students impolite or rude behavior	3.32		
26. Evaluation by principals or supervisors	2.20	4. Not enough time allotted to do the work	3.31		
6. Participation in IEP (Individualized educational plan) meetings about students	2.02	8. Inadequate salary	3.28		
		29. Inability to meet your personal or professional goals	3.26		
		25. Large number of students that lack of time to spend with individual kids	3.25		
		2. Loud, noisy students	3.17		
		5. Inadequate disciplinary policy of the school	3.16		
		30. Lack of fun or enjoyment involved in teaching	3.14		
		21. Students' defiance of teacher authority	3.08		
		15. Lack of recognition for good teaching	3.07		
		14. Poorly motivated students	3.05		
		18. Inadequate equipment and instructional materials	3.05		
		20. Lack of effective consultation and assistance	3.01		
		11. Responsibility for the students' progress/learning	3.00		
		13. Low status of the teaching profession	2.96		
		24. Lack of participation in decision-making	2.93		
		3. Poor career opportunities	2.84		
		27. Threat of aggression/physical harm	2.79		
		28. Lack of appreciation from your students	2.69		
		23. Having to punish students or use aversive techniques	2.63		
		22. Attitudes and behavior of other teachers/professionals	2.59		
		12. Writing and on-going evaluation of	2.58		

		IEPs for students for students with special needs			
		17.Constant monitoring of the students' behavior	2.52		

Effects of Stress and its Ranking

While the effects of stress vary in terms of feelings, thoughts and other physical symptoms, they also vary in degree of seriousness. Results showed that all the effects fell into the category of “frequent” and “infrequent/rare”, with the absence of any “very frequent” effects. Except for the physical effects “headaches” and “feeling exhausted”, all others were related to the psychological well-being of the teacher, for example “feeling sad”, “anxious”, “irritable”, “frustrated”, “anxious” or “tearful”. On another note, the highly ranked “How often does school stress affect other aspects of your life?” demonstrates that the teacher’s daily life is considerably affected by the stress that they carry away with them from school. It is important to mention that all frequent feelings, thoughts, and physical symptoms were stress-related factors affecting the teacher’s own well-being, rather than factors relating to external control. Therefore, all the effects of stress that were presented in the list had an internal locus of control. As mentioned in previous studies, the consequences of stress and its effects lead to inner clashes that differed from one person to another (McGrath et al., 1989).

In contrast, the least frequently encountered effects of stress were “How often do you feel distant from students with special needs?” and “How often do you feel like quitting teaching students with special educational needs?” Remarkably, ranking these two stress effects at the bottom of the list clearly showed that teachers, both mainstream and special needs, exhibited a strong commitment to the teaching profession (i.e. their lack of desire to quit teaching), and a highly professional attitude (i.e. disallowing stress to make them feel distant from students). This contradicts what Engelbrecht et al. (2003) report in their study, which stated that educators have negative opinions concerning the inclusive education programs for students with learning disabilities and behavioral problems. One plausible explanation for the mismatch between the findings of the current study and those of Engelbrecht et al. is that educators argue against an inclusive education program only when enough resources can be allocated to education programs that are tailor-made for students with special needs.

We noticed that feeling exhausted was common among all teachers, regardless of their grade or specialty. This effect could be attributed to sources of stress that were related to general

professional teaching challenges that were independent of special education students.

It was observed that both types of teachers, general/mainstream classroom and special educators, shared similar challenges but with some differences. These challenges affected the teachers negatively. Previous studies have shown that occupational stress leads to health problems that negatively affect the person concerned (Waltz, 2016). Furthermore, as Malak (2013) notes with regard to inclusive education, education should be offered as the right of all children in the developing world. Therefore, despite all the accompanying stress, mainstream classroom teachers should have a minimum level of exposure to special education students. With the lack of resources for special education departments, special students will more often attend inclusive classes; where general/mainstream teachers are expected to be competent and equipped to handle the accompanying challenges arising from teaching special needs students. The justification for this is the undertaking that all teachers make, namely: to deliver education to all children, and at the professional level it helps teachers gain field experience and develop more effective teaching methods for special, as well as regular students.

Table 4. Three Quantitative Indicators for the Effects of Stress

Infrequent/Rare effect ($x \leq 2.5$)		Frequent effect ($2.5 < x < 4.5$)		Very Frequent effect ($x \geq 4.5$)	
Item	<i>M</i>	Item	<i>M</i>	Item	<i>M</i>
7. How often do you feel your heart beating fast?	2.43	1. How often do you feel exhausted	3.72		
9. How often do you get an upset stomach?	2.39	18. How often does school stress carry over to other aspects of your life?	3.56		
3. How often do you feel angry from the students having special educational needs?	2.24	17. How often do you feel overwhelmed by your work?	3.41		
15. How often do you feel unsuccessful about teaching students having special needs?	2.15	2. How often do you feel frustrated?	3.27		
8. How often do you feel unable to cope?	2.13	6. How often do you have headaches?	3.07		
16. How often do you feel bored by your work?	2.10	5. How often do you feel nervous/anxious?	2.98		

13. How often do you feel like quitting teaching student having special educational needs?	1.94	11. How often do you feel guilty about not doing enough?	2.84		
14. How often do you feel distant from students having special needs?	1.88	4. How often do you feel depressed/ sad?	2.77		
		12. How often do you feel tearful?	2.70		
		10. How often do you feel irritable?	2.57		

Coping Strategies and its Ranking

From the results, it is noticeable that teachers resorted to various strategies to counteract stress. In general, all the coping strategies had an internal locus of control, apart from these four strategies, namely: “Taking courses and workshops to improve skill”, “Discussing problems with professional colleagues”, “Discussing problems with personal friends and family”, and “Getting professional counselling or therapy”. The only coping strategy that was directly related to the school was “Taking courses and workshops to improve skills”, since it was the school administration that sent the teachers to attend workshops and courses to update their knowledge and improve their skills. As for the rest of the external coping strategies, they were related to friends, family and other people who were not related to the school. Interestingly, the majority of the coping strategies that were deemed “extremely effective” were categorized as “internal”. Among the “extremely effective” coping strategies, “Organizing your time and setting priorities” corresponded to what we previously identified as the main sources of stress namely: “Demands on after-school time” and “Too much work to do”. In the researchers’ opinion, most teachers dealing with students with special needs were stressed because they lacked time to fulfil their duties; this explains why time management and setting priorities were effective ways to release stress. As a result, it was clear that teachers were controlling their stress by using different coping strategies to a certain extent. Therefore, schools and teachers themselves should help to develop improved coping strategies and find different ways of using them. They could apply the recommendations below, which might help to reduce the level of stress that teachers are encountering on a daily basis at school.

Another “extremely effective” coping strategy, “Doing relaxing activities”, agreed with the findings of Chan et al. (2010), who identified the most effective techniques as sleeping, social interaction, relaxing, and watching television. Furthermore, McGrath et al. (1989) mention that the

results of previous studies show that active strategies include pursuing their hobbies and other activities in their daily life, or even at school during their free time.

“Taking a day off” also ranks among the “extremely effective” coping strategies. We believed that taking a day off from working activities helped the teacher to relax, reduce stress and renew energy. In the same vein, Gillespie and colleagues (2001), mention in their study that taking regular vacation breaks from work, exercising, and applying therapies such as yoga and massage, also help in alleviating stress.

On the other hand, the coping strategies that were least used by the majority of teachers in the current study were “Using substances or prescribed medication” and “Smoking cigarettes”. The researchers believe that ranking these two strategies at the bottom of the list was a sign of the teachers’ healthy lifestyle. It is also worth noting that “Getting professional counselling or therapy” ($N=91$) represented one of the least-used strategies when coping with stress. Again, the experience of the researchers in Lebanon show that resorting to psychotherapy to release stress is still not an option considered by Lebanese teachers, and continues to be looked upon as a social taboo in Lebanese culture.

Furthermore, the differences in the mean scores recorded between general/mainstream and special education teachers point to the fact that each category of teacher resorted to different coping strategies when dealing with stress. For instance, it is clear that the mean score for “Taking a nap, forgetting it, walk away for a while” registered a notable difference between general/mainstream and special education teachers in comparison to other coping strategies. Field experience shows that taking a nap is a common strategy among special education teachers, helping them to step back from the realm of teaching and all the accompanying stress.

As for the coping strategies “Taking a day off”, “Leaving the school problems at school”, “Discussing problems with personal friends and family” and “Getting professional counselling, special education teachers recorded a higher mean value than general/mainstream teachers. These results show that the special education teachers exhibited a more proactive attitude than the general/mainstream teachers did. Institutions can offer relaxation methods that help to reduce psychological and physiological effects of stress (Colligan & Higgins, 2008).

On another track, the coping strategies recording the least difference in mean scores between general/mainstream and special education teachers were “Smoking cigarettes” and “Organizing your time and setting priorities”. This shows that some of the coping strategies were

common to both groups. The researchers believe that the number of teachers who smoked cigarettes was low, since smoking on campus is forbidden in educational institutions in Lebanon. However, smoking remains very common in Lebanon and the Middle East as a whole. Continuing, all types of teachers teaching different subjects should work on organizing their time and setting priorities in their life. This could help in organizing their working environment inside the school, and in achieving their everyday priorities outside the school. This aligns with what Colligan and Higgins (2008) reported, that reducing the workload helps to achieve a more relaxing and well-balanced working environment. Antoniou, Ploumpi and Ntalla (2013) also emphasized that such job strategies and problem-solving techniques lead to personal success.

Table 5. Three Quantitative Indicators for the Coping Strategies of Level of Stress

Mildly Effective ($x \leq 2$)		Moderately Effective ($2 < X \leq 3$)		Extremely Effective ($3 < x$)	
Item	M	Item	M	Item	M
13. Gain or loss of appetite	1.83	1. Discussing problems with professional colleagues	2.98	5. Organizing your time and setting priorities	3.51
14. Smoking cigarettes	1.51	3. Leaving the school problems at school	2.97	6. Doing relaxing activities [hobby]	3.35
12. Using substances or prescribed medication	1.29	2. Discussing problems with personal friends & family	2.51	8. Taking a day off	3.31
		15. Getting professional counseling or therapy	2.33	7. Taking a nap; forgetting it; walk away for awhile	3.16
		11. Drinking coffee and energy drinks	2.30	10. Walking/jogging/maintaining diet and exercise	3.10
				9. Restructuring to improve personal/professional expectations or goals	3.08
				4. Taking courses and workshops to improve skill	3.03

Relationship between Sources/Effects of Stress and Coping Strategies

The findings showed that the majority of the sources and effects of stress had a weak correlation with the coping strategies. For example, the coping strategy “Discussing problems with professional colleagues” showed a weak positive correlation with eight sources presented in the list. The coping strategy “Organizing your time and setting priorities” was also shown to have a slightly negative correlation with 10 of the effects presented in the survey. Although the results of

this study did not provide conclusive evidence of the effectiveness of the mentioned coping strategies in dealing with stress, they were in line with the findings of previous studies that emphasized the importance of some of these strategies. Gillespie et al. (2001) state that social interaction among peers alleviates stress. In the same vein Engelbrecht and colleagues (2003) mention that lack of positive interactions between colleagues and poor working conditions are two sources of stress. Moreover, taking regular vacation breaks from work, exercising, and using therapies, such as yoga and massage, also help in dealing with stress (Gillespie et al., 2001).

It is also worth turning the spotlight on the coping strategies that had a moderate correlation with the stress effects, whether positively or negatively. Interestingly, “Discussing problems with professional colleagues” was negatively correlated with “How often does school stress carry over to other aspects of your life?” ($r=-0.326$), and “Discussing problems with personal friends and family” was negatively correlated with the effect “How often do you get an upset stomach?” ($r=-0.311$). While the majority of teachers did not resort to professional counselling or therapy, these results showed that they were seeking alternative outlets to release stress, such as talking to co-workers, friends, and family members. Furthermore, this aligned with the strategies reported in previous studies, such as the ABC (Activating event, Beliefs, Consequences) stress management model suggested by Waltz (2016).

The results emphasized the importance of improving one’s personal and professional skills in order to alleviate stress. “Taking courses and workshops to improve skill” had a moderately negative correlation with an increased feeling of exhaustion “How often do you feel exhausted” ($r=-0.321$). Therefore, teachers felt psychologically more comfortable attending these courses and workshops. Most teachers were affected psychologically rather than physically. “Organizing your time and setting priorities” had a moderately negative relationship with the effect “How often do you feel depressed/ sad?” ($r=-.348$) and “How often do you feel unable to cope?” ($r=-0.398$). We can thus deduce that when teachers organize their time and set priorities, they will feel less depressed, sad, and more able to cope. In the researchers’ view, a stress management workshop or training session would be an effective means for helping teachers deal with stressful situations. Finally, the coping strategy “Restructuring to improve personal/professional expectations or goals” had a moderately negative correlation with the effect “How often do you feel bored by your work?” ($r=-0.335$). This means that being more structured in one’s work leads to reduced levels of boredom. The researchers believe that if stressors were properly identified, and positive coping

strategies successfully used, teachers would achieve a stress-free, friendly classroom environment.

Table 6-A. Correlation between Sources of Stress and Coping Strategies

Item	1	2	3	4	5	6	7	
	Discussing problems with professional colleagues	Discussing problems with personal friends & family	Leaving the school problems at school	Taking courses & workshops to improve skill	Organizing your time and setting priorities	Doing relaxing activities [hobby]	Taking a nap; forgetting it; walk away for awhile	
1. How stressful do you find being a teacher dealing with special needs student?	.041	-.038	.111	-.091	-.150	.028	-.034	
2. Loud, noisy students	-.035	-.055	.060	-.213*	-.142	-.101	-.060	
3. Poor career opportunities	.200*	.088	.125	.057	-.125	.099	.092	
4. Not enough time allotted to do the work	0.000	.003	-.014	-.131	-.166	.034	.110	
5. Inadequate disciplinary policy of the school	.025	.135	.122	-.071	-.127	-.093	-.072	
6. Participation in IEP meetings about students	-.125	-.128	.043	-.117	-.067	.046	.103	
7. Students impolite or rude behavior	.085	-.070	.107	-.032	-.127	-.020	.003	
8. Inadequate salary	-.093	-.178	-.127	-.129	-.124	-.039	-.082	
9. Too much work to do	-.262**	-.150	-.176	-.216*	-.234**	-.066	-.074	
10. Attitudes & behavior of school principal or head of the special education department in school	-.231**	.044	-.018	-.113	-.128	-.066	.025	
11. Responsibility for the students' progress/learning	-.110	-.134	-.073	-.086	-.058	-.074	-.093	
12. Writing and on-going evaluation of IEPs for students with special needs [paperwork]	.147	-.249**	-.036	-.028	-.081	.168	.089	
13. Low status of the teaching profession	.069	-.114	.151	.048	.049	.281**	.183	
14. Poorly motivated students	.208*	-.136	.084	.210*	.031	.077	-.044	
15. Lack of recognition for good teaching	.049	.011	.031	.044	.032	.042	-.062	
16. Dealing with the parents of students	.082	-.118	.089	.077	-.111	.127	-.043	
17. Constant monitoring of the students' behavior	.084	-.024	.157	.060	-.013	.087	-.004	
18. Inadequate equipment and instructional materials	.093	.015	.123	.159	.033	.157	.036	
19. Demands on after-school time	-.053	-.038	-.094	-.133	-.222*	-.020	.027	
20. Lack of effective consultation and assistance	.063	-.004	.007	-.010	-.053	.136	.114	
21. Students' defiance of teacher authority	.171	.101	.183*	.088	.006	.051	.139	
22. Attitudes and behavior of other teachers/professionals	.118	.061	.152	-.004	.077	.003	.162	
23. Having to punish students or use aversive techniques	.222*	.023	.072	.112	.158	.195*	.186	
24. Lack of participation in decision-making	.082	.155	.074	.172	-.033	.223*	.108	
25. Large number of students that lack of time to spend with individual kids	.097	-.086	-.069	-.078	-.049	.115	.177	
26. Evaluation by principals or supervisors	.023	.002	.063	.090	.009	.086	.045	

27. Threat of aggression/physical harm	.185*	.044	.029	.248**	.238**	.126	.106	
28. Lack of appreciation from your students	.200*	.103	.059	.232*	.004	.117	.184	
29. Inability to meet your personal or professional goals	.241**	-.023	.011	.113	-.007	.030	.021	
30. Lack of fun or enjoyment in teaching	.149	-.101	-.022	.045	-.038	.180	.032	

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

In this situation, their educational goals would be met and their professional responsibilities accomplished (Guglielmi & Tatrow, 1998).

The results have shown that whenever the department's management, namely the principal or head of department, was not cooperative, teachers resorted to radical measures to cope with stress. The coping strategy "Using substances or prescribed medication" showed a moderately positive correlation with "Attitudes and behaviour of school principal or head of the special education department in school" ($r=0.371$).

Table 6-B. Correlation between Sources of Stress and Coping Strategies

Item	8 Taking a day off	9 Restructuring to improve personal or professional expectations or goals	10 Walking, jogging or maintaining diet and exercise	11 Drinking coffee and energy drinks	12 Using substances or prescribed medication	13 Gain or loss of appetite	14 Smoking cigarettes	15 Getting professional counseling or therapy
1. How stressful do you find being a teacher dealing with special needs student?	.038	-.020	-.014	.071	.054	-.065	-.047	-.040
2. Loud, noisy students	.102	-.019	-.004	-.022	.128	.033	.126	.230*
3. Poor career opportunities	.015	.112	.096	-.040	.257*	.064	.058	.062
4. Not enough time allotted to do the work	-.019	.042	.044	-.019	.238*	-.051	-.017	.097
5. Inadequate disciplinary policy of the school	.100	-.002	-.020	-.016	.201	-.013	.027	.159
6. Participation in IEP meetings about students	.004	-.257**	-.034	.001	.102	.127	-.044	-.297**
7. Students impolite or rude behavior	.037	-.057	-.075	-.085	-.029	-.001	-.107	.074
8. Inadequate salary	-.048	-.018	-.161	.132	.251*	.147	.138	.109
9. Too much work to do	-.047	-.013	-.167	-.031	.191	.081	.068	.003
10. Attitudes and behavior of school principal or head of the special education department in school	-.138	-.115	.014	.113	.371**	.266**	.023	-.030
11. Responsibility for the students' progress/learning	-.198*	-.067	-.069	.005	.152	.028	-.067	.048
12. Writing and on-going evaluation of IEPs for students with special needs [paperwork]	.051	-.013	.071	-.057	.166	.102	-.132	-.092
13. Low status of the teaching profession	.019	.122	.099	-.033	.121	.021	-.093	.035
14. Poorly motivated students	-.121	.117	.015	-.206*	.082	-.021	-.252*	.162
15. Lack of recognition for good teaching	-.030	-.098	-.048	-.042	.035	.172	.059	.168
16. Dealing with the parents of students	.073	-.050	.076	.060	.049	.136	.070	-.053

17. Constant monitoring of the students' behavior	-.036	-.053	.015	.007	.133	-.007	-.025	-.114
18. Inadequate equipment and instructional materials	.107	.109	-.055	-.023	.137	.006	-.139	.069
19. Demands on after-school time	.068	-.048	-.079	-.156	.037	-.035	-.109	.159
20. Lack of effective consultation and assistance	.212*	.110	.029	-.084	.215*	.069	-.057	.264*
21. Students' defiance of teacher authority	.228*	.050	.069	-.061	.178	.055	-.034	.182
22. Attitudes and behavior of other teachers/professionals	.098	-.058	.047	-.003	.196	.082	-.083	-.047
23. Having to punish students or use aversive techniques	-.018	.086	.101	-.066	-.005	-.086	-.001	.157
24. Lack of participation in decision-making	.003	.138	.161	.032	.170	.108	.035	.260*
25. Large number of students that lack of time to spend with individual kids	.031	.230*	.044	-.060	.152	-.051	.009	.192
26. Evaluation by principals or supervisors	-.071	-.080	.059	-.111	.176	.012	-.054	-.124
27. Threat of aggression/physical harm	.065	.225*	.011	.063	.192	.046	.077	.198
28. Lack of appreciation from your students	-.175	.120	.056	.037	.037	.014	.039	-.014
29. Inability to meet your personal or professional goals	-.105	.252**	-.001	.108	.212*	.239*	.181	.223*
30. Lack of fun or enjoyment in teaching	-.049	.186*	.102	.028	.099	.152	.073	.205

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 7-A. Correlation between Effects of Stress and Coping Strategies

Items	1	2	3	4	5	6	7
	Discussing problems with professional colleagues	Discussing problems with personal friends & family	Leaving the school problems at school	Taking courses and workshops to improve skill	Organizing your time and setting priorities	Doing relaxing activities [hobby]	Taking a nap; forgetting it; walk away for awhile
1. How often do you feel exhausted	-.278**	-.153	-.087	-.321**	-.194*	-.115	-.147
2. How often do you feel frustrated?	-.217*	-.117	-.057	-.108	-.245**	.042	-.016
3. How often do you feel angry from the students having special educational needs?	.065	.046	.127	-.193*	-.265**	.054	.041
4. How often do you feel depressed/ sad?	-.080	-.117	-.188*	-.165	-.348**	-.043	-.071
5. How often do you feel nervous/ anxious?	-.062	-.164	-.284**	-.180*	-.190*	-.019	-.044
6. How often do you have headaches?	-.086	-.185*	-.148	.096	-.163	.022	-.041
7. How often do you feel your heart beating fast?	-.022	-.142	-.028	-.005	-.142	.051	.073
8. How often do you feel unable to cope?	-.034	-.158	-.112	-.247**	-.398**	.009	-.085
9. How often do you get an upset stomach?	-.103	-.311**	-.008	.074	-.122	.090	.018

10. How often do you feel irritable?	-.184*	-.276**	-.113	-.102	-.254**	.060	-.053
11. How often do you feel guilty about not doing enough?	.037	.037	.069	.159	-.110	-.017	-.050
12. How often do you feel tearful?	-.099	-.025	-.066	.001	-.082	-.032	.028
13. How often do you feel like quitting teaching student having special educational needs?	-.104	-.178	.069	-.095	-.218*	.060	.045
14. How often do you feel distant from students having special needs?	-.138	-.211*	-.014	-.156	-.194*	.003	.087
15. How often do you feel unsuccessful about teaching students having Special needs?	.004	-.145	.091	.013	.011	.103	.149
16. How often do you feel bored by your work?	-.275**	-.198*	-.107	-.222*	-.199*	-.041	-.104
17. How often do you feel overwhelmed by your work?	-.159	-.237*	-.032	-.108	-.075	.173	.027
18. How often does school stress carry over to other aspects of your life?	-.326**	-.249**	-.232*	-.216*	-.144	.043	-.069

**Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 7-B. Correlation between Effects of Stress and Coping Strategies

Items	8 Taking a day off	9 Restructuring to improve personal or professional expectations or goals	10 Walking, jogging or maintaining diet and exercise	11 Drinking coffee & energy drinks	12 Using substances or prescribed medication	13 Gain or loss of appetite	14 Smoking cigarettes	15 Getting professional counseling or therapy
1. How often do you feel exhausted	-.156	-.065	-.163	-.053	.084	.102	.088	.024
2. How often do you feel frustrated?	-.032	.024	.046	.034	.053	.253**	.133	.131
3. How often do you feel angry from the students having special educational needs?	.167	-.031	.107	.079	.167	.091	.007	-.064
4. How often do you feel depressed/ sad?	.026	-.146	-.147	-.036	.006	.091	.018	-.015
5. How often do you feel nervous/ anxious?	.000	-.010	-.059	-.054	.074	.028	.066	.043
6. How often do you have headaches?	.011	.059	.015	.062	-.030	.135	.033	-.159
7. How often do you feel your heart beating fast?	.117	.053	.185	.086	.052	.179	.040	-.111
8. How often do you feel unable to cope?	.118	-.123	.042	-.141	-.037	.120	-.050	-.115

9. How often do you get an upset stomach?	.007	.040	.060	.014	-.102	.097	-.035	-.121
10. How often do you feel irritable?	.085	-.008	.070	.038	-.030	.117	.080	-.090
11. How often do you feel guilty about not doing enough?	-.117	.028	-.005	-.085	-.263*	.050	.002	.160
12. How often do you feel tearful?	-.072	.142	-.002	.192*	.043	.269**	.244*	.060
13. How often do you feel like quitting teaching student having special educational needs?	.122	.007	.143	-.027	.084	.000	.004	.116
14. How often do you feel distant from students having special needs?	.045	.047	.110	.036	.023	-.059	.089	.078
15. How often do you feel unsuccessful about teaching students having Special needs?	.085	.115	.208*	.011	-.201	-.218*	-.108	.102
16. How often do you feel bored by your work?	-.007	-.335**	-.054	.022	-.066	-.141	-.035	-.019
17. How often do you feel overwhelmed by your work?	.107	-.013	.024	.116	-.071	.104	.062	.104
18. How often does school stress carry over to other aspects of your life?	-.081	-.069	-.039	-.027	.002	.044	.119	-.017

**Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Future Directions and Study Limitations

Several implications can be drawn from the findings of this study. One implication could be the desirability of expanding the study sample. Differences between Anglophone and Francophone school systems might expose differences in perceptions of school personnel within each system. In addition, differences between public and private schools need to be explored. The systems of special education departments found in private Francophone schools are very different from those in the Anglophone schools. Along the same vein, public schools are not fully equipped to provide special education departments. In addition, the number of students with special educational needs found in both middle and secondary private Anglophone schools are not high. Schools with special education departments work mostly with elementary students. Consequently, this study was restricted to teachers in the elementary schools.

One limitation of this study was the small sample size of special education teachers. Of the 139 teachers, only 39 were special education teachers. However, this was beyond the control of the researchers due to the limited number of private schools with special education units/departments

in Lebanon. Another limitation was the discrepancy between participants' perceptions and actions as revealed by the quantitative data. In the quantitative part of the survey, there were teachers who did not complete the survey; and others who did not complete the questionnaire. Moreover, only a few participant-teachers responded to the open-ended qualitative question, which made us cautious about generalizing our findings. Some participants seem to have submitted socially desirable answers instead of their genuine opinions.

Conclusion and Recommendations

The following concluding thoughts and recommendations are given in light of the findings:

- Schools in Lebanon need to provide formal training and internship opportunities for the different types of special educational needs that teachers may encounter in their classrooms. This could be through establishing partnerships with Lebanese universities, and in-service training for teachers who teach children with special educational needs.
- The roles and job descriptions of special educators should be clarified so that all teachers understand that it is not only special education teachers who are responsible for students with special needs.
- The findings revealed that most mainstream classroom teachers were unaware of the Individual Educational Plan (IEP). Accordingly, it is recommended that special education experts play a more active role in introducing the IEP and involving general classroom teachers, counsellors and administrators in implementing this plan. The IEP would be helpful to teachers in terms of overcoming their stress, since they would understand more about each case they might encounter among the special needs students. The entire team that is working with the child should be aware of the goals and learning objectives that the special educator is working on throughout the academic year.
- From the results, we noticed that new resources and equipment are needed for both the teachers and students with special educational needs. Therefore, schools should provide in-service training for teachers that would help teachers focus on reducing stress and improving their attitudes towards students, peers and teaching itself.
- It is clear that schools should identify and combat stress by developing awareness and understanding of stress, and provide individual and group programs to reduce this, and develop measures through organizational changes that would prevent the environment from becoming

a major contributor to teachers' stress. Schools could invite psychologists or education experts to help explain the ABC model that would help reduce the stress level of teachers. Workshops and trainings are always needed for teachers to deal with stress.

- Since an excessive workload increases the level of stress for teachers, it is recommended that the school administration should employ experienced assistants for those classes with a high number of special educational cases so that the general, assistant and special educator are able to work together to reach their goals. This would encourage co-teaching techniques and would help with workload and time management.
- The number of students should be reduced to e.g. 25/class to allow teachers to establish a one-to-one relationship with students. This would also lead to excellent classroom management and student behavior (Al-Hroub, 2014, 2015).
- Having "Too much work to do" was shown to be one of the sources of stress. Thus, regular and special education teachers need to work together to discuss teaching methods and instructional activities that will need to be modified for students with special needs. This collaboration could be done through co-teaching techniques that may reduce the workload for both the regular and special teachers.

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Stakeholders' Views on Use of Sign Language Alone as a Medium of Instruction for the Hearing Impaired in Zambian Primary Schools

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Abstract

The study examined views of stakeholders on the use of Sign Language as a medium of instruction in the learning of hearing impaired in primary schools of Lusaka, Zambia. A case study design supported by qualitative methods was used. The sample size was 57, consisting of teachers, pupils, curriculum specialist, education standards officers, lecturers and advocates on the rights of persons with disabilities. Purposive sampling techniques to selected the sample, interview and focused group discussion guides were tools for data collection. The study revealed significant differences in views of stakeholders on use of Sign Language alone as medium of instruction. While most participants felt sign language alone was ideal for learning, others believed learners needed exposure to total communication (combination of oral and sign language) to learn better. Those who felt using sign language alone was better, believed the practice had more positive effects on learning and that use of oral language, total communication often led to confusion in classroom communication among learners with hearing impairments. Participants who opposed use of sign language alone were of the view teachers: were ill-prepared; signs were limited in scope; education system lacked instructional language policy and learning environment were inappropriate to support use of sign language alone in the learning process. The study recommended strengthening of training of sign language teachers and introduction of sign language as an academic subject before it can be used as the sole medium of classroom instruction in the Zambian primary schools.

Keywords: *Sign Language; Medium of Instruction; Hearing Impairment; Language policy*

Introduction

Persons with severe hearing impairments are naturally unable to hear and this is one of the reasons they prefer to use Sign Language in their everyday communication over spoken language. Sign Language by design is a language of the hearing impaired which uses manual communication to convey meaning and information as opposed to acoustically conveyed sound patterns (Bunyasi, 2010). This form of communication is used in the day to day communication among the hearing impaired as well as a medium of instruction in educational cycles. Stein, (2010) reported that Sign Language was a language expressed through a combination of hand shapes and facial expressions. The language itself contains structures and processes that spoken languages do not seem to have. Additionally, it has grammatical structures which are suitable as visual medium but not necessarily for use in oral language communication.

According to Smith (2000) and Bunyasi, (2010), Sign Language, in linguistic terms, is as rich and complex as any oral language despite the common misconception that it is not a real language as such. Smith (2000), believes that, it is important for one to understand factors surrounding its usage as a mode of communication to appreciate its increasing usage as a medium of instruction in the education of the deaf. Wakumelo and Miti, (2010), suggests that hearing impaired children need to be taught Sign Language for them to use it effectively in the learning process. The study reports that Sign Language needs to be learnt as a language and not necessarily depending on general usage of common signs used in the community. The concept of Sign Language in the educational sense refers to the use of Sign Language in the education system as a medium of instruction to facilitate teaching and learning (MoE, 1977). In relation to the hearing person, learning to speak a language starts with learning of concepts and associating them with objects and symbols as agreed upon in the community. Mandyata, (2011), believes the hearing impaired needed to be taught starting with the support of local signs before exposed to national signs for them benefit from its use as a medium of instruction. Unfortunately, this is not often the case for hearing impaired children born from hearing parents. Deaf children often are deprived of any form of organized language during the most critical phase of language development more so between the ages of 0 to 3 years. Such children find themselves exposed to a mixture of modes of communication which often leave them confused and unable to make sense of the communication. Smith (2000) argues that hearing impaired children, need longer time to learn their natural language-sign language to compensate for the period they had no access to any meaningful language for language acquisition and development.

The National Research Centre of Kenya, (2012) reports that supporting young children's use of Sign Language as a medium of instruction includes: building of new concepts on existing knowledge and experience; exposure to language objects and symbols in the environment and involvement in daily activities. Although it is recognized that children's understanding of concepts early in development, may be intuitive while a lack of explicit awareness of concepts in Sign Language tend to make it difficult for them to make use of their prior knowledge. It equally makes it difficult for them to form essential connections with language symbols and objects they may be encountering with in different environments. Given the research with hearing impaired children, the National Research Centre of Kenya, (2012) showed poor academic performance

among the deaf partially due to the inability of teachers to expose the children more to Sign Language. It is critical that the factors that seem to have effects on the use of sign language and achievement of learners with hearing impaired, are not fully investigated. The present study therefore, has the potential of showing the existing gaps in instructional communication and has the potential of showing specific areas of weaknesses that can be addressed early enough in the acquisition and development of sign language in the education of children.

Mbewe (1980), observes that Sign Language gave children with hearing impairment normal academic development and as such teachers who were assigned to teach the hearing impaired needed to not only be trained in Special Education, but also Sign Language to enable them to communicate effectively with learners. Sign Language bridges the communication gap and creates an emotionally secure social and learning environment. Most of the children who are hearing impaired are born into hearing families. Thus, from the onset they have no mentors or role models to help them acquire a sign language as they grow but depend on hearing mentors (Wakumelo, 2009). The crisis continues as these children enter school where it is now mandatory for pupils to learn in their mother tongue of the hearing learners from grade one to two, using the National Break Through to Literacy (NBTL) program. This is done before transitioning to learning in English in later grades (MoE, 1996; 2013). Several studies, such as, those conducted by Cummins (2000) and Drasgow (1998) have shown that using the mother tongue in learning facilitated learning of literacy skills in the second language. This however, does not seem to agree with the learning of the hearing impaired whose mother tongue remains sign language and local sign varies from home to home.

In this respect the Zambian government in 2003, embarked on a language policy through the NBTL experiences. According to the current instructional policy children are supposed to be taught literacy in their familiar language between grades one and four before an exposure to a new language. The pupils are expected to use skills acquired through a familiar language to learn the second language, such as, English Language. Pupils have to learn the vocabulary, culture and grammar of their familiar tongues before learning a second language. This however, did not seem to be the case for pupils with hearing impairments. In schools for the hearing impaired where this policy was attempted, what teachers taught was the local sign language- signs used by the local community as presented in Cibemba, Citonga; KiKaonde; Silozi or Cinyanja (major local Zambian languages) and not necessarily the official sign language. What really happened was that teachers used local signs to teach in a particular language of the area. Often this did not go well nor properly blended to guide the learners with hearing impairment. It left learners with hearing impairment more confused in their communication (Payne, 2005; Wakumelo, 2009). This led to a practice whereby, Cibemba speaking areas teachers taught the pupils with hearing impairment signs which were Cibemba. oriented or those with Kikaonde background by virtue of their oral base and nature making linkage with official sign language (a mixture of British and American sign language) used in formal classrooms quite difficult for the learners to assimilate. Andrews et al., (2002) urges that sign language alone was limiting as a medium of instruction. The studies appear to support the idea of using total communication approach (a mixture of oral and sign language) with inclusion of local signs in classroom practices.

According to Wakumelo and Miti, (2010), the hearing impaired learn by learning concepts in Sign Language and not by using Sign Language which was used by the community they live in. The hearing children in speaking communities learnt concepts by hearing and not necessarily through visual impression of the words and spelling, unlike the hearing impaired who have to depend on visual images which often come with their own challenges of interpretation of what is

seen into an expressive language. Bragiell, et al., (2016); KSL and KSDC (2006) proposed that the hearing impaired need to be taught using sign language as a medium of instruction right from their on-set of academic life and beginning with localized signs for them to perform well academically. The current study believes that it is during such period that pupils need to build capacity and skills in sign language to understand concepts necessary for their academic advancement hence, the need to expose them to more localized signs before introducing them to official sign language.

In Zambia, the National Assessments in reading of 1999-2003 revealed low performance in reading among children with Special Education Needs (CSEN), including the hearing impaired (MoE, 2003). The assessment showed that hearing impaired learners were the lowest in reading compared to other disability groups. The survey cited syntactic differences between Sign Language and English Language as the major reason for the low performance in reading among the hearing impaired. In 2012, regional mock examinations pass rate for learners with hearing impairments in grades 7, 9 and 12 in most schools in Zambia, the performance of the hearing impaired ranged from 34% and 43% while that of other disability groups was above 50% (MOE, 2012). The poor performance of pupils with hearing impairment was associated with challenges in medium of instruction- inconsistencies in modes of communication, inability to read for comprehension and mismatch in between formative and summative assessment employed by teachers and the Examination Council of Zambia (ECZ) respectively (Chifinda & Mandyata, 2017). The study observed that during assessment of the hearing impaired written standard British English was used as a medium of communication while, learners with hearing impairment were accustomed to the deaf culture ie. telegraphic language. As a result, learners with hearing impairment found it difficult to read and understand the questions in assessment items to respond appropriately. Chifinda and Mandyata (2017) explanation was that most teachers of the hearing impaired did not have sufficient skills in Sign Language to use it as a medium of instruction. Hence, the dependence on total communication. Bowe, (1998) reports that most teachers of the deaf used as a result, oral language and pointing as modes of instruction because of limited sign language. These raises concern about appropriateness of language of instructions available in schools as well as the low achievement levels of the deaf in comparison with that of the hearing learners (Starczewska, et al., 2010).

Studies have begun to move an in-depth understanding of language of the deaf in relation to that of the hearing. Whitaker, (2000), for example, noted that, there are four stages of learning associated with verbal language but not necessarily supportive to sign language learning. These are; speaking, reading and writing. The children with hearing impairment do not start learning at stage one and two of the oral language learning process, but start learning at the spoken or verbal language stage and then proceed to the writing stage. This variation causes them to be disadvantaged because they have no transfer of skills from hearing and speaking (Harlan, 2011). As a result, such learners develop slow or poor reading and writing skills. Sign Language is supposed to compensate for hearing and speaking, less work is done to prepare them during their formative stage hence the failure to express themselves better in sign language. It is in view of this that the researcher sought to explore the views of various stakeholders on the call for use of sign language alone as a medium of instruction in selected primary schools for learners with hearing impairment in Lusaka in Zambia.

Problem

There has been an increasing concern on the part of various stakeholders about the use of total communication as opposed to Sign Language as a medium of instruction in the learning of learners with hearing impairment in Zambia (Mbewe, 1980; MoE, 1996). Wakumelo, (2009) reported that while the school system preferred the use of total communication in the learning of students with hearing impairment, learners with hearing impairment themselves felt more conformable with the use of sign language alone in during classroom practice. Although the concerns of the learners with hearing impairment over the language of instruction for the deaf has been documented in the available literature, little was known on the views held by various stakeholders on the call for use of sign language alone as a medium of instruction in classes for the hearing impaired in Zambia. The present study therefore, sought to explore the views of held by various stakeholders on the call for use of sign language as the only a medium of instruction in the learning of hearing impaired in primary school in Lusaka district in Zambia.

Objectives

The following objectives guided the study

- (i) To establish the views of held by various stakeholders on the use of Sign Language as the medium of instruction in classes for the hearing impaired
- (ii) To assess factors that might have led to the call for use of sign language alone as a medium of instruction in the learning of the hearing impaired
- (iii) To ascertain measures that may contribute to improved use of sign language as a language of instruction in the learning of the hearing impaired.

Research Questions

- (i) What views are held by various stakeholders on the use of sign language as the only medium of instruction in the learning of the hearing impaired?
- (ii) What factors might have led to the call for use of sign language as the sole medium of instruction in the learning of the hearing impaired?
- (iii) What measures should be taken to improve the use of sign language as a medium of instruction in the learning of the hearing impaired?

Significance

The significance of this study was that, it would help class teachers, school administrators, education managers and policy makers understand and appreciate the role of sign language as a medium of instruction in the learning of the hearing impairment. It was also hoped that the findings would provide guidance to ECZ and teachers on the best teaching and assessment practices amongst learners whose medium of instruction was mainly sign language. Additionally, the findings on appropriate medium of instruction would significantly help improve the delivery of classroom instruction through use of sign language to learners with hearing impairment in schools.

Topographical features of the site

Our research area was Lusaka district in Lusaka province of Zambia. It is one of the six districts in the province. The study province itself is one of the ten provinces in the Republic of Zambia and serves as the capital city of Zambia. As a country, Zambia is divided into 105 districts and 10 provinces (CSO, 2010). It is a land-locked nation. It is surrounded by several countries namely; on the southern front; Zimbabwe and Botswana; on western side; Namibia; Angola and

on the northern front; Tanzania; Democratic Republic of Congo and on the eastern front, Malawi and Mozambique. The country has approximately, 752, 614 square kilometers with a national population of 14.97 million (CSO, 2010). The study province has a population of 2, 907,111 of the 14.97 million people (CSO, 2010). Out of the total pupil population of 3, 818, 336 (primary and secondary level), Lusaka province, has 456, 125 pupils. Out of which 175, 329 were school going children including those with disabilities. 10, 323 of these were learning with disabilities of which 2,944 (17%) were learners with hearing impairment in the study district (MoE, 2013). The district itself has had a rich and eventful history over time starting from the colonial (British) rule. It has been a government administrative center, commercial and light industrial district. It reached its height of its glory in the late 2000s because of administrative, good road, air railway transportation system and commercial activities. The study district has been famous for its central-ness and easy connectivity with other provinces until the 2000s when its economy was on the decline because of low industrial, commercial activities and negative developments (low copper prices) on the London Metal Exchange market. The study area is currently one of densely populated part of Zambia with high level informal employment activities. Its population is highly dependent on informal sector with most of the people living below poverty datum line (less than a US \$ per day), a situation negatively impacting of social services such as health and education.

Theoretical framework

The study was guided by Naomi Chomsky's theory on language acquisition of 1977. This theory emphasizes on everyone having an inborn faculty for first language acquisition. At birth children always had brains whose neural circuits had linguistic information. Chomsky believes that if a child is nurtured well first language, acquisition and use is realized within the shortest time possible. This theory also emphasized that children think in their first language, therefore they should be exposed to rich environments that enhance their language early in life. Chomsky claims that the child possess an innate capacity for dealing with linguistic universals. The child generates a theory of grammar to help understand and produce an infinite number of sentences. He further emphasized that the child was biologically predisposed to learn any form language including sign language as the brain matures. Humans were believed to be "*powered*" for language development naturally and the environment simply triggered its emergence. This theory in a way, advocates for use of language as a medium of instruction including use of sign language. By implication it means that the first language for learners who are deaf-sign language naturally was better placed to serve as a medium of instruction than the oral language. The study recommends that at entry to the school, children should be exposed instructions based on the most familiar language. The study theory implies that with help of the indigenes signs the deaf children can be slowly but steadily moved to learn a national system of Sign Language.

Method and Materials

A case study design supported by a qualitative data collection method was used. This design was selected because it allowed the researchers to focus on a smaller unit, group or community relevant to the theme of the study (Marrian and Simpson, 1995). The approach allowed for a detailed and in-depth study in order to establish views of stakeholders on the use of sign language alone as a medium of instruction in the learning of the hearing impaired. The target population for this study consisted of teachers for the hearing impaired, curriculum specialists, and education standard officers, lecturers from two teacher training institutions preparing

teachers for the deaf and advocates for the rights of persons with hearing impairments from the study district.

The sample size was drawn from teachers and pupils with hearing impairments from selected upper primary schools of Lusaka, Zambia. The three selected schools and district gave a total of 57 participants. Out of this, twenty (20) were teachers, thirty (30) pupils, two curriculum specialists, one education standard officer from the Ministry of education, two lecturers from teacher training institutions and two advocates on the rights of persons with hearing impairment. In this study, purposive sampling procedure was used to select participants. These were selected on the basis that they had sufficient experience and a rich source of information to support the inquiry. Thus, pupils with hearing impairment and their teachers were picked from the three special schools and were subjected to purposive sampling. Purposive sampling was also used to select teacher trainers, curriculum specialists, standard education officers and advocates for the rights of persons with hearing impairment. This was a rich sample from where the researchers, choice a few individuals who were considered to be knowledgeable about the issue under study to make a more meaningful contribution (Morten, 1997).

The interview guides were used for teachers while focus group discussion guides were used on pupils. Class room observation checklist where teacher-participants were observed teaching in their respective classes. This was found to be quite resourceful, teaching method of study as well as pupils' participation and comprehension were found to be enriching. Interview guides were also used to provide guidance about what participants were saying. Data was analyzed using thematically. Qualitative analysis method employed involved reduction, editing and coding of data in readiness for a descriptive presentation of the findings. The emerging themes were categorized and presented descriptively as aspects of the findings.

Results and Discussion

We now present the findings of the study conducted from 2016 to 2017 on the views of stakeholders on the use of sign language as a medium of instruction in the learning of learners with hearing impaired. The findings as well as discuss are presented before and the conclusion. The study does highlight how our findings have addressed the knowledge gap identified earlier on the views of stakeholders on the use of sign language alone as a medium of instruction in classes for the hearing impaired in the Zambian schools.

Table 1: Personal Profile of Participants

S. No.		<i>Personal Profile of Participants</i>					
1	Gender	Male			Female		
		23 (40.4%)			34 (59.6%)		
2	Location of study school	High density		Medium density		Low density	
		Male	Female	Male	Female	Male	Female
		6	10	8	10	10	13
3	Age	15-24 years	25-34 years	35-44 years	45-54 years	55 & above	
		11 (19.3 %)	18 (31.6 %)	9 (15.8 %)	12 (21.1 %)	7 (12.3 %)	

5	Socio-economic <i>Status of family participants</i>	Self-employed	Formal Employment	Unemployed
		58 (59%)	33 (33%)	8 (8%)
6	<i>Place of living of participants</i>	<i>Rural</i>		<i>Urban</i>
		0		57 (100%)
7	Type of Family	<i>Nuclear Family</i>		<i>Extended family</i>
		9 (15.8 %)		48 (84.2 %)
8	Qualifications of non-learners participants	Primary Teaching Certificates	Secondary Teaching Diplomas	University Degrees in Teaching
		8 (14.0%)	32 (56.4%)	17 (29.8%)

Gender

Gender was one of the major elements considered during the study because, views of held by male and female stakeholders were considered significant in the use of sign language alone as a medium of instruction. We had fifty-seven (57) participants of which 23 (40.4%) were male and 34 (59.6%) were female participants

Location

The location of participants was yet another factor that was considered important for this kind of study. Out of the 57 participants 16 (10 females) were from high density areas; 18 (6 males) were from medium density while the reminder 23 (13 female) came from low density areas of Lusaka urban in Zambia.

Age

The age of the participants was equally considered to be significant in the present study. Because age of views of stakeholders had the potential of contributing to diverse views on subject of discussion, the study considered it. It was evident from the study that, majority of participants 18 (31.6 %) interviewed were aged between 25–34 years, followed by those between 45-54 years who made up of a study population of 12 (21.1%). The last category of participants represented were those aged 55 years and above, who made up 7 (12.3 %) the sample size.

Socio-economic Status

The socio-economic status of participants was also considered to be important in the time of interviews in that, it had a bearing on the quality of support available to learners on the use of sign language as a medium of instruction. Majority of the participants (58) 59% were self-employed (informal sector of Zambian economy), 33 (33%) were in regular employment (formal sector of the economy eg. teaching) while the remaining eight (8%) of the participants were unemployed (mostly serving as housewives or house husbands in homes). Those who said were self-employed were mainly engaged in work as: herbalists; marketers; street venders-mainly selling Salaula (second-hand clothes); call-boys or bus conductors; owned small groceries or worked in vegetable shops. Those who were in formal employment on the average worked as:

teachers, curriculum specialists, administrators in government or non-government organizations involved in the education of the disabled.

Types of Families and Place of Living

The type of the family from which pupils came from was looked during data interviews. For the purpose of this study, participants' family set up was considered as either nuclear family or extended family. This was necessary as it had a bearing on support available to learners with hearing impairment in the acquisition and development of sign language in the study areas. We interviewed, 9 (15.8 %) from nuclear families while 48 (84.2 %) claimed to have had extended families. All the participants 57 (100%) were from urban schools in Lusaka, district in Zambia.

Qualifications

Qualifications of participants were seen to be of particular importance in the study. It enabled us to understand the influence of sign language on the learning of learners with hearing impairments. The situation of our research was that without taking into account grades of learner-participants, we interviewed 8 (14.0 %) who had primary teaching certificates, 32 (56.4%) with secondary teaching diploma while, the remaining 17 (29.8%) had a university degree in education.

Views of stakeholders on Use of sign language alone as a medium of Instruction

It was evident from the study that most teachers of the hearing impaired did not use Sign Language as a medium of instruction, instead teachers favored the use of total communication, oral language and pointing in the teaching of the hearing impairment. In support of this findings, one male pupil-participant observed; ***Excerpt 1:** Sometimes teachers use Sign Language alone and at times use both Sign Language and oral language which sometimes confuses us.*

The above assertion was supported by more than half of the hearing teachers and pupils who participated in the study. They observed that pupils with hearing impairment understood lessons taught by deaf teachers who used mainly sign language than when taught by hearing teachers who heavily depended on total communication. These observations were supported by Svartholm (1994); Adoyo, 2002) who reported that teachers in schools for the hearing impaired were required to impart knowledge through use of sign language and not necessarily a mixture of communicative skills. However, Harlan, (2011) explains the situation of the hearing teachers as them being linguistically handicapped in relation to sign language. They rather preference use of oral language or a combination of oral and sign language in classroom instructions.

The use of a combination of communicative approaches was disapproved by the learners with hearing impairment themselves as was evidenced by one female pupil-participant who said: ***Excerpt 2:** For us who are deaf, it is very difficult to learn when Sign Language is not used in the classroom. Most teachers do not know Sign Language. They only write notes on the board and ask pupils to copy without explaining to them. Very few teachers show knowledge of Sign Language in the school.*

The findings agreed with those of Kamukwamba, (2017), who explained the above observation on the premises that, there were inadequacies in the use of Sign Language as an instructional language. As a result, led to the failure of teachers to operate effectively sign language. The concern was attributed to teacher training institutions preparing teachers for deaf. Most teacher-participants complained that Sign Language courses offered at two key teachers education institutions: The University of Zambia (UNZA) and Institute of Special Education (ZAMISE),

lacked content as well as practical skills related activities in sign language. It was this position the somehow led to graduate teachers failing to effectively use sign language alone as a medium of instruction.

Inadequacies in the preparing of teachers at college level, worsened the situation as most teachers graduated with little or no knowledge of Sign Language as a medium of instruction in the learning of learners with hearing impairment. Adoyo (2002); Brgieal and Kaniok, (2016) for instance reported that in Kenya and Poland, teachers for the hearing impaired lacked competence in Kenyan Sign Language and Polish Sign language to effectively communicate in sign language alone during lessons. These studies showed teachers preference for more use of total communication as opposed to sign language alone. Other studies such as Okombo (1994) reported lack of policy on Sign Language as a medium of instruction. Mindness, (2006) indicated lack of experts in sign language as contributing elements to failure to teach through use of sign language alone. These studies indicated that, the problem in use of sign language as the only medium of instruction, emanated from the teacher training institutions which did not prepare teachers for such but to teach through use of total communication. Wakumelo, (2009) reporting on Zambia, cites teachers' inability to use Sign Language as a medium of instruction of learners with hearing impairments. She sees it as a product of ill-preparation of teachers; lack of interest in the language of the hearing impaired and limited resource to teach it. In relation to curriculum for pupils with hearing impaired one female curriculum specialist said that, ***Excerpt 3:** We are aware of teachers' lack of Sign Language skills and we want to introduce Sign Language as a subject and medium of instruction in the learning of the hearing impaired. We believe this move will help both the teachers and learners in the use of sign language in classroom.*

From the above excerpt, we observe that teachers do not have sufficient vocabulary and skills in sign language for them to use it as the sole medium of instruction. It is also evident from the excerpt that there was a mismatch in the preparation of teachers in that communicative skills in sign language, were based on use of total communication and not necessarily use of sign language alone as a medium of instruction. The results suggested that teachers see themselves as inadequate in sign language to express to go full in use of sign language. The findings were in line with the findings of Wakumelo (2009) who reported that teachers of the hearing impaired in Zambia had an important role to play in making sure that hearing impaired pupils were competent in their Sign Language. However, teachers themselves needed to have sufficient sign language and vocabulary to contribute to academic success of learners with hearing impairment. Ideally Sign Language participants felt that sign language needed not to be used as a medium of educational instruction but be supported by other communicative modes for it to be helpful to learners.

It was clear from the findings that, teachers were not competent in the education of the hearing impaired, thus failed to prepare the hearing impaired for full participation in the real classroom work. This view was supported by one female pupil who said, ***Excerpt 4** We are deaf, if teachers use spoken language in the classroom, we cannot hear anything that is why most of us even fail tests and examinations. We need to be taught in Sign Language, which is our language of communication and makes it easier for us to follow.* Further, we may say from participants' use of statements such as *that is why most of us even fail tests and examinations* signifies the negative impact the inability of teachers to teach pupils with hearing impairment using sign

language alone has on the academic work of the pupils. It is evident from the statement that. Pupils with hearing impairment were at ease when communicated to through sign language than when other communicative modes of communication were employed. Pupils believed that use of sign language alone as a medium of communication allowed them to explore and understand their learning environment, learning needs and allowed them to perform better.

The above view did agree with a study conducted by Marrian and Simpson, (1995) and Chifinda and Mandyata, (2017) who observed that teachers of the hearing impaired much depended on pupils where they wrote words on the board and pupils gave them the signs thus the pupil who were supposed to be the learner became the teacher due to adequate sign language skills among teachers. Chifinda and Mandyata, (2017) have seen the development as a strange system in a country where deaf education had been in existence since the 1950s. The system of education for the deaf had been unable to full develop sign language as an academic subject and a language of instruction. The study further revealed that some teachers due to their inability to use Sign Language resorted to increased use of aids, objects or apparatus for the children to see what they are referring to. The study further found that there was an acute problem of lack of enough knowledge in Sign Language among teachers and pupils solely depend on it as a medium of classroom instruction. For example, when it came to teaching of subjects like mathematics and science both teachers and pupils appeared to run short of appropriate signs to use. The few teacher-participants who were familiar with Sign Language were reported to have only knowledge of basic Sign Language. The limitation in sign language skills tended to delay the teaching and learning process in the classrooms.

Factors influencing use of sign language as a medium of instruction

The study showed that there were several factors that might have influenced participants' views on the use of only sign language as a medium of instruction. All learners cited the teacher as the source of knowledge but lacked skills in sign language. Teachers used oral language and pointing as modes of instruction. Pupils however, attributed poor academic performance to teachers' inability to use Sign Language in classroom instruction. Pupils were not able to follow classroom instructions because of communicative challenges. In support of this view, one female pupil with hearing impairment had this to say: ***Excerpt 5:** We need teachers who know Sign Language, adequate and relevant learning resources and more time to learn for use to effectively learn.*

A careful and systematic analysis of the above excerpt shows that pupils with hearing impairment were not doing well in academic work. Use of verbs, adverbs, quantifiers, adjectives and discourse such as; inadequate skills; insufficient resources and limited time, is a clear expression of inner-feelings and unique value attached to use of sign language but influenced by several limitations Mind-ness, (2006). The excerpt agrees with Wakumelo and Miti (2010) whose explanation of the source of pupils' poor academic work was in teachers' inability to effectively communicate through use of sign language. Pupils complained of teachers lacking right attitudes on language of instruction for the deaf. In a study by Wakumelo (2009) it was noted that pupils did not even ask teachers questions when they did not understand an element in the lesson because of communication challenges between them and teachers.

It was evident that learners generally felt that communication was an obstacle because they had problems understanding concepts, class room instructions from teachers due to poor communication between teachers and pupils. There were teachers who did not understand Sign Language, teaching and communication was sometimes not effective thereby contributing to academic failures. Some topics were also difficult to understand in Sign Language and that certain mathematical and science concepts were not in Sign Language, so teachers just finger spelled such words without providing clear explanation, meaning or just ignored the items. ***Excerpt 6:** Some teachers seem to have a negative attitude towards certain aspects or topics in Sign Language. When they make mistakes in signs we try to help them, but they never follow and continue with oral language and wrong signs as they teach us.* Arising from the above statement, it appears that the teachers had negative attitudes towards use of sign language as well as pupils with hearing impairment. Teachers believed that hearing impaired were slow in understanding concepts, it was evident that teachers felt uncomfortable to be corrected in their use of sign language by pupils they taught hence, unwilling to acknowledge support. As a result, this led to Mathew's effects in learning process (2001) because the severity of their reading delay increased as they progressed and negative attitude toward language used as well as learners in classrooms became significant. This view was also shared by Stein (2013), who argues that having teachers who are negative on use of sign language as a medium of instruction, can adversely affect a student's ability to learn.

Measures to improve use of Sign Language as a medium of Instruction in the classroom

With regard to challenges identified in the use of sign language as a medium of instruction, all the participants apart from pupils, saw the need for the introduction of Sign Language as an academic subject in schools as well as teacher training institutions. Participants felt such a move would enhance the sign language literacy skills of teachers and pupils. The findings were in line with the New Break through to Literacy Policy of the Zambian Ministry of Education (2001) which emphasized on use of a familiar language in early stages of children's education. Wakumelo and Miti, (2010), equally called for a new instructional language policy on the learning the hearing impaired, a policy that requires such children in pre-school and lower primary classes to receive lessons in localized signs facilitating an easy shift to a more official form of sign language. This had the potential of enhancing initial literacy in sign language just as it was the case in other Zambian languages. In Sweden, Chupina (2006) reported that Swedish Sign Language became the language of instruction as well as a taught subject itself in 1995. Since then, pupils with hearing impairment had registered better academic performance than before because of exposure to more Sign Language as a medium of instruction and as an academic subject. Chupina (2006) further noted that, the hearing impaired with initial literacy in local sign language experience, presented themselves well when shifted to official Swedish sign language. Increased use of sign language contributed to good literacy for Swedish hard of hearing and pupils with hearing impairment. In Zambia however, this was not the case as the Ministry of Education appears to favor the use of total communication (mixture of oral and sign language) as opposed to sign language alone thought learners themselves see to disapprove the practice. Some participants felt that increased use of sign language as the sole medium of instruction in formative stage of pupils had the potential of improved academic performance among learners with hearing impaired.

In the present study, learners gave a variety of suggestions that could help them improve their performance in Sign Language usage. Among the suggestions, learners said, ***Excerpt 7:** There is*

a need to simplify some aspects in signs by blending them with local signs for easier explanations of certain concept in certain topics and easier comprehension. Pupils seem to show concern on the complexity of some of the signs used to explain certain concepts. Pupils feels teachers needed to simplify signs and be somehow slow in signing, ought to use familiar and proper signs to ease pupils' understanding. Participants also called for more trained teachers in sign language who would be able to handle more difficult topics in Sign Language and use assorted teaching and learning materials for them to benefit from use of sign language as the sole medium of instruction. These entire suggestions boil down to the need for more qualified teachers who were conversant in Sign Language and called for more classroom learning time. As long as the situation remained the way it was, the high levels of failure rates among pupils with hearing impairments would continue. This finding was supported by Jokinen (2010), who reported that use of a bilingual approach required Sign Language to be used as the principle instructional language and spoken language taking a minor role in classroom communication.

When asked on how to overcome some of challenges identified in the use of sign language alone in the teaching of pupils with hearing impairment, one male curriculum specialist had this to say, **Excerpt 8:** *We use total commination help teachers learn Sign Language and make efforts to be attentive in class. We also seek for assistance from teachers who know Sign Language and fellow pupils whenever we encounter difficulties in learning* This view was supported by a male lecturer who reported that: **Excerpt 9:** *Although training at the college level may not have be adequate in sign language, teachers often made an effort to improve on their Sign Language through interaction with pupils and community exposed to deaf culture.* From these findings, it was obvious that most teachers were not conversant in Sign Language but had basic skills interaction freely with learners and use it as a base to learn sign language. These findings were also acknowledged by Svartholm (1994) and Hernmans, (2008) who noted that the more teachers and pupils became exposure to sign language the more they became proficiency in sign language usage.

On availability of learning resources, the study revealed that there was a strong need to provide relevant teaching and learning resources to support the learning of the hearing impaired. The view was supported by one female teacher who observed: **Excerpt 10:** *hearing impaired learn through seeing hence it is necessary that attention is paid to the supply of teaching and learning materials and not just the language of classroom communication.* These findings were in consistent with the works of Ahlgren, (1994) who reported that teachers resort to use of aids, object or apparatus for the children to see what they were referring to because of limitation in sign language. On the issue of improving sign language communication, participants suggested that there was need for teachers to improve their signing skills through undergoing Sign Language training in order to communicate with learners as was expressed by one male teacher who said: **Excerpt 11:** *I do not know sufficient Sign Language, I have challenges teaching hearing impaired as I mostly use teaching aids to help me explain lessons in class. I would like to go for training or workshop to help me improve in Sign Language skills.* The findings were supported by the Global Deaf Connection (2010) report in Kenya which noted of the ill-preparedness of teachers in sign language usage in classrooms. The study called for more training to improve the sign language base of classroom teachers in the study district of Zambia.

On the question of whether the institutions responsible for training teachers for the hearing impaired had received any complaints about the performance of their graduates, one male lecturer said, ***Excerpt 12:** We receive complaints on lack of practice in Sign Language, I think this is due to shortage of time and overloaded teacher education curriculum.* From the content of the above except, failure among teachers to perform in the use of sign language, was partially due to limited training time and overloaded teacher education curriculum which gave student-teachers less time for sign language practice. These findings were in line with those of (Adoyo, (2002) and Allen, (2008) who indicated that teachers of the hearing impaired were weakness in sign language content which affected skills as well. They lacked adequate exposure to the practical side of sign language during initial training. Participants in the present study therefore have called for more practice in the preparation of sign language teachers for them to have sufficient skills to use sign language as a major mode of classroom communication. On the whole, teachers were doing their best to teach learners with hearing impairment through a mixed approach to classroom communication in the Zambian school system.

Conclusion

Although the results of this study indicated the significance of using sign language as core language of communication in the learning of the hearing impaired, there were few limitations which must be acknowledged. For example, because of lack of comprehensive training in sign language, failure to consider Sign Language as a full-fledged language by the school system but using it as a remedial measure in communicating with hearing impaired, the results are still noteworthy and some assumptions can be made. On the question of how Sign Language was used, the study established that sign vocabulary and grammar were taught only in lower primary grades and not in upper grade which negatively imparted on the development sign language and skills among learners. Another limitation was that teachers preferred use of a mixture of Sign Language, spoken language and total communication which often left pupils confused in their academic work. Although teachers had a good reason for mixing the signing system, pupils themselves felt teachers' approach was detrimental to their language development as children with hearing impairment, especially to those whose competence had not developed enough to benefit from use of total communication in classroom practice.

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A Preliminary Study of the Internal Consistency and Validity of the Traditional Chinese Adaptation of the Impact on Family Scale

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Abstract

The aim of this study was to examine the internal consistency and factor structure of the Traditional Chinese version of the Impact on Family Scale in order to make cross cultural comparisons. The Traditional Chinese version of the scale was administered to 137 Hong Kong Chinese parents of children with Autism Spectrum Disorders. Two short versions of the scale based on 15 and 11 items were examined to investigate whether the single factor of the short scale from the United States could be replicated. The shortened version of the Impact on Family Scale has the potential to be useful for cross-cultural comparisons between United States and Traditional Chinese samples.

Keywords: *Impact on Family Scale, traditional Chinese, autism spectrum disorders, Hong Kong SAR,*

Introduction

Although autism spectrum disorders (ASD) have been recognized since the 1940s in Western countries (Kanner, 1943), ASD is not generally well understood by the Asian community (Neik, Lee & Chia, 2014, Author/s, 2016). Adapting to the birth of a child with a developmental disability (such as ASD), which frequently requires life time care in countries with limited support services, has been reported to result in a series of stressful events for parents (Connolly & Gersch, 2013; Author/s, 2012). The present study originated from a growing awareness of the needs of Hong Kong Special Administrative Region (HKSAR) Chinese parents of children with ASD by author, who conducted investigations in 2014 and 2015, into the coping strategies of Chinese families raising a child with ASD in this region.

Cross-national surveys, which analyze an experience that takes place within one country, (for example the impact on families raising a child with ASD), while comparing the way that experience is perceived across many different nationalities, have become increasingly popular (Dyches, Wilder, Sudweeks, Obiakor & Algozzine, 2004; Kogan et al. 2008). However, international survey research involving Hong Kong (HK) Chinese populations has been plagued with chronic low response rates (Hise, Solano-Mendez, & Gresham, 2003; Rao, 2009). After a meta-synthesis of 2341 articles, Thornton et al. (2016) suggested that survey participation rates were the lowest among Asian Americans compared to that of any other ethnic group.

Chinese participants have been known to be under represented in family studies for some time (Holcombe, Jacobson, Li & Moinpour, 1999) and language issues have been identified as a recurrent barrier to research participation by Chinese samples (Tu et al. 2005; Des Jarlais et al. 2005). The major reasons for non-participation were lack of translated materials, feeling intimidated by English, and the lack of translation of key words or terms (Thornton et al. 2016). Given that only 3.5% of the HKSAR Chinese population use English as their usual language (Census and Statistics Department, 2012), someone who does not speak English very well may use this to hide a refusal to complete a survey presented in English. To increase participation in survey research projects, it is clear that first one must remove language barriers and preferably use specific dialects.

There are currently two Chinese writing systems in use in Chinese speaking regions, namely simplified and traditional Chinese. The simplification movement of Chinese characters first emerged in the early 1990s, and the simplified script widely implemented today was the version created during the writing reform initiated by the central government of Mainland China in 1956 for easing the learning process in both recognition (reading) and production (writing) (Zhao & Baldauf, 2011). Today the majority of Chinese speaking regions, including Mainland China, Singapore and Malaysia, use the simplified script, while the HKSAR and Taiwan continue to use the traditional script.

To understand what the participants from another culture have to say about a topic, it is necessary to know something about the sociolinguistic background they come from. Hong Kong SAR is a very homogeneous society linguistically, with over 98% of the population being Cantonese speaking (Census and Statistical Department of Hong Kong, 2013). The early literacy experience of most HKSAR Chinese people from the age of three, when they start learning the Chinese character system in kindergarten, until they enter secondary school, is Cantonese. Even though their secondary and tertiary education is most likely to have been mixed mode (i.e., Cantonese and English), HKSAR Chinese people's educational experience is firmly rooted in a Cantonese. Further, outside of school, their life-world is predominantly Cantonese: family life, movies, menus, the media, signage, etc. are all offered in the medium of Cantonese. Living in a Cantonese-speaking environment, HK Chinese have little need to use English outside of their work, where they may only use it for writing and some teaching environments.

Cross-cultural and international collaborative studies in the HKSAR are needed in educational psychology research because past studies have found that having a child in the family with a developmental disability can induce feelings of stress, impose major psychological and social adjustments, increase the burden of care and place the entire family at risk (Huang, Shang & Xing, 2009). In a recent study, author/s (2016), assessed the needs and responses of 75 parents following the diagnosis of childhood autism and found that the parental concerns included a possible delay in diagnosis and dissatisfaction in the lack of communication by the healthcare team post-diagnosis. For studies in which quantitative measures are used, it is necessary to translate these measures into the language of the culture being studied. This is not a simple process. In order to study the quality of life of people with diverse cultural backgrounds, research instruments must be reliable and valid in each culture studied (Munet-Vilar'o & Egan, 1990).

Within the field of family impact studies, stress and coping as a result of raising a child with ASD, a lack of representation by HKSAR Chinese parents in the literature maybe because there are a limited number of measures available in languages other than English. Currently, a validated measure of family impact from this target culture does not exist. The aim of this study was to prepare the Impact on Family Scale (IFS), a tool designed by Stein & Jessop (2003) for use in a different cultural and language context. Specifically, we aimed to translate and adapt this tool to make it culturally viable for Cantonese speaking and traditional script reading participants, and to determine its face validity by investigating the factor structure.

The cross-cultural adaptation of a familial impact status self-administered questionnaire for use in a new country, culture, and/or language necessitates use of a unique method, to reach equivalence between the original source and target versions of the questionnaire. It is now recognized that if measures are to be used across cultures, the items must not only be translated well linguistically, but also must be adapted culturally to maintain the content validity of the

instrument at a conceptual level across different cultures. Attention to this level of detail allows increased confidence that the impact of raising a child with a developmental disability (such as ASD) is described in a similar manner in multinational trials or outcome evaluations. The term cross-cultural adaptation is used to encompass a process that looks at both language (translation) and cultural adaptation issues in the process of preparing an instrument for use in another setting.

The Present Study

According to the results of the 2012 Census figures, the population of HKSAR was registered to be 6,857,100, while the overall prevalence of autism in this region was reported to be 3800 (0.055%) (Census and Statistical Department of Hong Kong, 2013). This is supported by the World Report on Disability (World Health Organization, 2011), which indicated that 5.49 children in every 10,000 are diagnosed with autism in HK (0.054%). The diagnosis of a developmental disability (such as ASD) in a child can trigger a range of emotional responses in parents and across family systems.

Family studies are especially important in the context of the traditional values in HKSAR because family members in HKSAR consider themselves to be responsible for taking care of each other (Chan & Lee, 2004). This is known as filial piety (author/s, 2016). In Confucian philosophy, filial piety means that an individual should be capable of supporting and taking care of their parents in their old age. Children with a moderate to severe impact disability (which can may be the case with ASD) may face obstacles in the fulfillment of their filial piety duties to their aging parents (author, 2014). Chinese parents of children who have significant impact disabilities do consider that their children represent disruptions to the flow of filial piety (FP) exchanges (Hu, Wang & Xiao, 2012). They understand that the “natural” progression of reciprocity that should flow from birth into ancestry is unlikely to ever be reclaimed. Consequently, raising a child with a disability in a Chinese family is likely to increase that family’s perceived demand and longevity of caregiving responsibilities. The measurement of the meaning that raising a family member with ASD holds for HK Chinese parents and their view of their family life will not only assist parents with their own psychological distress, but can guide the provision of much needed education and support services that can strengthen family coping and positive adjustment (author/s, 2013). The aim of the present study was to develop a traditional Chinese script version of the IFS for parents of children with ASD and to examine the internal consistency and factor structure of the translated tool.

Method

Participants

The total sample for this study consisted of 137 parents from HKSAR Chinese families who were rearing at least one family member who had been diagnosed with ASD between the ages of 3 –18 years. This age group was chosen as it relates specifically to the school age years and thus, should highlight a range of information, educational and support needs by families. Informed consent was obtained from all individual participants included in this study.

General Description of the Children with ASD

Two different kinds of data were obtained. Firstly, general demographic data was collected about the child (e.g., gender and age of the child, age of diagnosis, and birth order). Refer to Table 1. The mean age of the children was 8.12 years (SD 3.59), and the mean age at diagnosis was 4.33 years (SD 1.99). Parents rated their child as functioning at either an average (20%) or below average (25%) intelligence level. The majority (55%) of parents indicated that they just did not know.

General Description of the Parents and Families

Secondly, information was collected about the respondents. Respondents varied considerably in age (range: 23-68 years, mean: 46 years). The majority of the respondents (n=111, 81%) were mothers. With regard to marital status, most of the respondents (84.3%) reported living with a partner. Of the participants who had partners, 58.5% of those partners worked full time. Respondents were asked to indicate their annual household income, however very few parents completed this question. The next step involved collecting data on the parents' perception of the impact of their child's disability on family behaviour via the use of the Traditional Chinese version of the Impact on Family Scale (TCIFS).

Table 1. Demographic Information of the Participants (N = 137)

Age	Sub Total	Gender		Birth Order		Average age at diagnosis
Age	Sub Total	Male	Female	1 st	2 nd	Average age at diagnosis
3	10	8	2	7	3	2.80
4	12	11	1	11	1	2.92
5	7	6	1	6	1	3.71
6	19	16	3	17	2	4.11
7	20	15	5	16	4	4.70
8	17	12	5	12	5	4.69
9	14	11	3	11	3	4.14
10	13	11	2	13	-	5.54
11	3	3	-	3	-	4.33
12	4	2	2	2	2	5.25
13	7	6	1	5	2	4.86
14	1	1	-	1	-	3.00
15	1	1	-	1	-	3.00
16	2	2	-	1	1	5.00
17	5	4	1	5	-	5.80
18	2	1	1	2	-	6.50
Total	137	110	27	113	24	

Procedure

Strategy 1: Recruitment at five community support services for Children with ASD in HKSAR.

The first strategy was to recruit parents indirectly via three NGO (private) special schools and two acupuncture clinics serviced by Chinese medicine practitioners for children with Autism/ASD. Teachers/practitioners nominated the children who were diagnosed with autism/ASD for inclusion in this project. In total, 150 packages with surveys and self-addressed stamped envelopes were sent out to parents of children with ASD. Thirty-eight completed participant consent forms were returned from one of the largest private schools for students with ASD in Hong Kong SAR (the Autism Partnership School). These 38 participants constituted the pilot group and were interviewed as they completed the pre-final TCIFS. As there were no requested changes or adaptations to the pre-final TCIFS, this version became the final translated version of the TCIFS. A further 58 participants (recruited via Strategy 1) requested that a hard copy survey be posted to them. In total, from the 150 packages, 96 completed TC Impact on Family surveys were returned.

Strategy 2: Recruitment at Autism Information Conference for Parents in HKSAR.

The second recruitment strategy was to approach participants directly at local NGO, (free entry) parent information seminars on ASD that are held annually in HKSAR during Autism Awareness Week. Two hundred copies of a flyer explaining the project, and giving a web link for either (a) on-line participation, or (b) details for a mail-out data collection method, were distributed at this event. Seventy five expressions of interest were either, handed to the first author at the conference, or were posted, e-mailed or faxed to the first author within the following week. Seventy-five hard copy final versions of the TCIFS then posted out to interested participants. This strategy resulted in a total of 41 returned TCIF surveys. The outcome of recruitment strategies 1 and 2 resulted in a return of 137 completed TC Impact on Family surveys, achieving a response rate of just under 40 %. It has been reported in the past that a response rate of 31% should be considered as a good return rate for survey research conducted in HKSAR (Flower-dew, 1999). In addition, Kramer, Schmalenberg, Brewer, Verran & Keller-Unger (2009), suggest that response rates of 40% or more have acceptable psychometric properties for unit-specific scales.

Measure

The original version of the Impact of Family Scale (IFS) was designed to measure impact of pediatric chronic physical illness on the family (such as asthma, seizure disorder, heart disease, and diabetes mellitus) and had 24 items. The IFS (short version) has been used to assess the impact of chronic illness on family functioning (Williams, Piamjariyakul, Williams, Bruggeman & Cabanela, 2006). It has also been found to be useful in gauging the impact on families raising children diagnosed with behavioral disabilities (Sheeber & Johnson, 1992), behavioural tic disorders (Woods, Himle & Osmon, 2005) and autism (author, 2012). According to Williams et al. (2006) the IFS is one of the most frequently used measures of a family member's perception of the effect of a child's disability in both clinical and health service research across numerous diagnostic groups.

Like many health status questionnaires, the IFS was developed in an English speaking country. However, as a testament to its international popularity, the IFS has also been translated into five European languages (e.g., Spanish by Stein and Jessop, 1989; Italian by Kolk, Schipper, Hanewald, Casari & Fantino, 2000; Turkish by Bek, Simsek, Erel, Yakut & Uygvr, 2009; Brazilian-Portuguese by Barbosa & Gaviao, 2009; and French by Boudas et al., 2013). To the best of our knowledge, the IFS has not yet been translated into any Eastern languages. Specifically, the IFS has not been translated into the Chinese traditional script.

The factor structure of the IFS has been examined extensively. Stein and Riessman (1980) reported that following a factor analysis of the preliminary scale, items relating to siblings and those with low factor loadings were eliminated. A total of 24 items were retained with a four factor solution (financial burden, family/social impact, personal strain, mastery) and a total score was also generated for the scale. Stein and Jessop (2003) further evaluated the factor structure on three separate samples, retaining all 27 non-sibling related items from the Stein and Riessman (1980) study. The original factor structure was not replicated and they reported a consistent single factor (general negative impact) for 15 items across all three samples, with weak and inconsistent factor-based clustering for the remaining items. Stein and Jessop (2003) recommended the use of the revised 15 item IFS.

Subsequent to this recommendation, there have been several studies examining the structure of the revised IFS. Boudas et al. (2013) translated the 15 item IFS into French and exploratory factor analysis revealed a two factor solution, with one main factor explaining 77% of the variance and a second factor explaining 10% of the variance. Williams Piamjariyakul, Bruggeman & Cabanella, (2006) conducted factor analysis of a number of versions of the IFS including a 15 item scale. Their initial exploratory factor analysis suggested a two factor solution, with the first factor accounting for 46% of the variance and the second less than 7%. Following additional, analysis they concluded that, on balance, the one factor solution represented the best fit. Individual items were subsequently analyzed using item response theory and it was suggested that the scale could possibly be shortened to 11 items.

Dehn, Korn-Merker, Pfafflin, Ravens-Sieberger, & May, (2014) further examined the factor structure of a number of versions of the IFS, including the revised 15 item (Stein and Jessop, 2003) and the 11 item scale proposed by Williams et al., (2006). Dehn et al., (2014) found a difficult to interpret two factor solutions for the 15 items scale with one factor explaining 39% of the variance and the second 14%. They did, however, find the expected one factor solution for the 11 item scale, accounting for 54% of the total variance. In summary, examination of the factor structure of the 15 item IFS has yielded somewhat inconsistent findings and warrants further examination.

Procedure

The Translation Process

The guidelines proposed by Beaton, Bombardier, Guillemin & Ferraz (2000) were used for the cross-cultural adaptation of the 15 item IFS (Stein & Jessop, 2003). This method has been successfully used in the past by the American Association of Orthopaedic Surgeons (AAOS) Outcomes Committee when they coordinated the translation of the different components of their outcomes battery (McConnell, Beaton & Bombardie, 1999). More recently, this process was used by Boudas et al. (2013) to translate the 15 item IFS into French.

Stage 1 – Initial Translation.

The first stage in adaptation is the forward translation. The IFS (15 item short version) was translated into Traditional Chinese (TC) by two independent native TC translators. The bilingual translators whose mother tongue was TC produced two independent translations. **Translator 1** (T1) was a female PhD (education studies) student working as a senior research assistant on several projects with the first author. As a result, Translator no 1 was aware of the concepts being examined in the IFS. This was necessary to provide equivalency from a more clinical perspective and a more reliable equivalency from a measurement perspective (Beaton et al., 2000). **Translator 2** (T2) took on the role of the naïve translator. T2 had a background in gifted education and he was neither aware of nor informed of the concepts being quantified in the IFS. The second translator needs to be less influenced by an academic goal in order to offer a translation that reflects the language used by the population, often highlighting ambiguous meanings in the original instrument (Guillemin, Bombardier & Beaton, 1997). Each translator produced a written report of the translation that they completed, identifying any challenging phrases or uncertainties.

Stage 2 – Synthesis of the Translations.

The two translators and the first author, who took on the role of recording observer, synthesized the results of the translations. Working from the original questionnaire as well as the (T1) and (T2) versions, a synthesis of these translations was first conducted (producing one common translation (T – 12). A written report, carefully documenting the synthesis process, noted each of the issues identified by the individual translators and how they were resolved. The next stage was completed using this T-12 version of the IFS.

Stage 3 – Back Translation.

Working from the T-12 version of the IFS and totally blind to the original version, two new translators (BT1 and BT2) then translated the T-12 back into English. This is a process of validity checking to make sure that the translated version is reflecting the same item content as the original versions (Leplege & Verdier, 1995). The back translations of the T-12 were produced by two secondary school teachers (i.e., a music and a history teacher) who had been living in HKSAR and working at an International Secondary School for 19 and 23 years respectively. Their mother tongue was English, neither was informed of the concepts that were being explored, nor did they have any background understanding of Autism. This was to avoid information bias and to avoid eliciting unexpected meanings of the items in the translated document (T-12) (Guillemin et al. 1997).

Stage 4 – Expert Committee.

The next step is to form a committee. The composition of the committee is important to achieve cross-cultural equivalence. According to Beaton et al. (2003), the committee should comprise of methodologists, educational professionals, language professionals and the translators (forward and backward). The expert committee's role is to consolidate all versions of the IFS and to develop what will be the pre-final version of the IFS before pilot testing. At the time of the study the first author was working as an Associate Professor at a university in HKSAR. The expert committee comprised of the Associate Dean of Research, an Assistant Research Professor,

the Head of the Language Centre of that university (who were all bi-lingual) and the first author (whose mother tongue is English).

The committee approach although useful is regarded by some as weak, because it does not necessarily control for shared misconceptions (Maneesriwongul & Dixon, 2004). The reason being that a committee participant may be reluctant to criticize another participant's suggestions especially if there is a perceived inequality of power in the group. This is particularly the case in Asian communities where positions of status are highly regarded and where it would not be acceptable for a junior to publically correct his/her senior colleague. As a result, none of the translators (T1, T2, BT1, BT2) attended the expert meeting. However, the materials that were at the disposal of the committee included the original English version of the IFS, each translation (T1, T2, BT1, BT2) along with all of the corresponding written reports from each of the four translators which explained the rationale of each decision at earlier stages. Consensus was reached by the expert committee on all 15 items.

Stage 5 – Test of the Pre-final Version.

According to Beaton et al. 2003, the final stage of the adaptation process is a pretest and ideally between 30-40 persons should be used. The pilot test of the Traditional Chinese (TC) version of the IFS (TCIFS) sought to use the pre-final version with participants from the target setting (i.e., Hong Kong Chinese parents raising school aged children with autism/ASD). In the present study, 38 parents completed the pre-final version of the TCIFS. Each participant completed the survey via an interview so that they could be probed about what he or she thought was meant by each question item and the chosen response. This interview process ensured that the TC adapted version of the IFS retained its equivalence in an applied setting. There were five interviewers, who were bilingual, enrolled in a Master of Education program of study, and who had completed the Educational Research Methods and Data Analysis units which involved being trained in face to face interview techniques.

Analyses

A Confirmatory Factor Analysis (CFA) was carried out on the 15-item scale, with the aim of replicating the factor structure of Stein and Jessop (2003). The model did not provide adequate fit, and addition of covariances based on modification indices did not sufficiently improve the fit. An Exploratory Factor Analysis (EFA) was therefore carried out to determine whether an alternative factor structure was preferable with the 15-item scale. The Parallel Analysis suggested two factors. However, the resulting two-factor structure was uninterpretable. It was decided therefore that the 15-item scale did not satisfactorily produce meaningful factor structure and an alternative subset of questions was needed to be investigated. Following Dehn et al. (2014), a subset of 11 items was considered and a CFA carried out with all items loading on to a single factor. With the addition of one covariance based on modification indices, this model had adequate fit. The relative fit of the 11-factor models to the 15-factor models was assessed by comparing the Akaike Information Criterion (AIC) and the Bayesian Information Criterion (BIC) between models to determine which has the better fit.

Results

Semantic Adaptation of the IFS into Traditional Chinese.

The only point requiring discussion regarding the semantic and content equivalence of the Traditional Chinese version of the IFS occurred at Stage 5 of the translation process. The issue debated at Stage 5 focused on the term to be used for the disability known as autism or ASD. There is no Traditional Chinese term for autism or ASD. Consequently, it was decided that as all of the participants in this study were going to be accessed through community support services which required a diagnosis of autism or ASD at point of entry, the TC term for *special needs* instead of autism/ASD would be used.

Participants were asked to give their perception of being interviewed on this topic and their opinion of the semantic quality of the TC version of the IFS. The key themes for this cohort were that: the TCIFS questions were clear and easy to understand; the issues raised in the TCIFS were important to the participants; parents also mentioned that they would appreciate some Government initiated innovation to increase HKSAR community awareness about individuals with disabilities. Sample participant responses are outlined below.

I was very afraid of facing this situation. It is not easy to talk about raising a child with a disability in Hong Kong. I am pleased that this Professor is asking us about our life. Yes, the survey questions were easy to understand, I know what to say. Will the Government know the answers? (Interviewee No 5).

Because of my son, I understand the importance of this interview. So that is one thing that I would say is a positive thing. You're trying to help others. The questions? Yes, their meaning is clear (Interviewee No 26).

This is rare (*being interviewed in Traditional Chinese about family impact*). No one ever asks me how I am, or even how my child is, not even the social workers. The Government should promote more to let the people understand more about these problems. The questions are good. Anyone can know how to answer (Interviewee No 8).

Statistical Analysis of the TC-IFS.

A CFA using Amos version 23 was carried out, with all items loading on to a single factor. See Table 2 for descriptive statistics for all items. The fit of the original model (Model 1) was not satisfactory. The chi square was highly significant, $\chi^2(90) = 221.66$, $p < .0005$, CMIN/DF = 2.46, CFI = .83, TLI = .80, RMSEA = .10. The addition of three covariances based on modification indices (between items k and w; items k and x and items v and w) improved the fit somewhat (Model 2): $\chi^2(87) = 168.63$, $p < .0005$, CMIN/DF = 1.94, CFI = .89, TLI = .87, RMSEA = .08. The AIC/BIC for Model 1 were 311.66 and 323.66 respectively. Smaller AIC/BIC figures for Model 2 (264.63/277.43) indicated that the covariances improved the fit of the model. Despite having better fit than Model 1, the overall fit of Model 2 was still not ideal. See Table 2 for factor loadings for both models.

Table 2. Descriptive statistics for each item and item loadings for the four Confirmatory Factor Analysis models

	Loadings				
	Mean (SD)	Model 1 (15 items)	Model 2 (15 items with covariances)	Model 3 (11 items)	Model 4 (11 items with covariances)
Can't travel out of city	2.28 (.99)	.64	.64	.63	.63
Little desire to go out	2.04 (.86)	.50	.50	.49	.51
Hard to find reliable person to care for child	2.84 (.89)	.67	.68	.67	.67
Need to change plans at last minute	2.55 (.88)	.55	.56	.56	.56
See family and friends less	2.39 (.96)	.60	.62	.59	.62
No time for other family members	2.77 (.75)	.72	.72	.71	.72
Family gives up things	2.84 (.77)	.77	.76	.78	.76
Fatigue is a problem	3.03 (.80)	.71	.71	.75	.73
Live from day to day	2.22 (.75)	.48	.46	.47	.47
Travelling to hospital is a strain	2.72 (.78)	.62	.65	.60	.64
Live on roller coaster	2.95 (.83)	.54	.53	.53	.52
People treat us as special	2.16 (.76)	.67	.66	N/A	N/A
Wonder whether to treat child "specially"	2.79 (.77)	.53	.51	N/A	N/A
Think about not having more children	2.69 (.99)	.45	.45	N/A	N/A
Nobody understands the burden	2.58 (.76)	.48	.44	N/A	N/A

The 11 items retained in all four models are listed first, followed by the four items removed in Models 3 and 4.

15-item scale: Exploratory Factor Analysis

A parallel analysis using the rawpar.sps program (O'Connor, 2000) was carried out using the raw data and permutations on the original dataset specified. The analysis suggested retaining two factors. Examination of the scree plot similarly suggested retaining two factors. An EFA using Principal Axis Factoring and oblimin rotation was therefore run, retaining two factors. The eigenvalues of the two factors retained were 6.04 and 1.29, while the eigenvalue of the first factor not retained was 1.10. The analysis accounted for 41.62% of common variance and the two factors correlated with each other at .59. Table 3 gives the factor loadings as well as the extracted communalities for each item (major loadings are in bold). The loadings appear promising, with each item loading onto a factor and only one cross-loading using the criteria of Tabachnick and Fidell (2007) of a major loading above .32. Furthermore, Cronbach's alpha was

acceptable for both factors: for Factor 1, $\alpha = .87$, for Factor 2, $\alpha = .74$. On looking at which items load onto which factors however, it is difficult to determine what each factor means from a theoretical standpoint. Factors did not seem to correspond to those identified in previous versions of the scale and there appeared to be no other clear conceptual structure to the identified factors. Given the difficulty in interpreting these two factors, a final round of analyses was conducted with a further reduced set of items following Dehn et al., (2014).

Table 3. Major Factor Loadings and Extracted Communalities Based on a Factor Analysis with Oblimin Rotation.

Item	Factor 1	Factor 2	Communality
Family gives up things	0.81	-0.04	.62
Hard to find reliable person to care for child	0.77	-0.11	.50
People treat us as special	0.70	-0.02	.47
Fatigue is a problem	0.67	0.06	.50
No time for other family members	0.66	0.10	.52
Travelling to hospital is a strain	0.63	0.003	.40
Think about not having more children	0.51	-0.07	.22
			.29
Live on roller coaster	0.49	0.07	
			.42
Can't travel out of city	0.47	0.24	
Need to change plans at last minute	0.41	0.20	.30
Live from day to day	-0.11	0.84	.61
Nobody understands the burden	0.05	0.60	.40
Little desire to go out	0.22	0.38	.30
See family and friends less	0.35	0.35	.38
Wonder whether to treat child "specially"	0.29	0.34	.32

Note. Items are presented in list of descending standardized loadings for Factor 1 followed by Factor 2.

11-item scale: Confirmatory Factor Analysis

Four items, (w, g, o and m) were removed from this analysis. As with the 15-item version, all items were set to load onto a single factor (Model 3). For this model, $\chi^2(44) = 104.00$, $p < .0005$, CMIN/DF = 2.36, CFI = .89, TLI = .86 and RMSEA = .10. This model was a better fit to the data than both Model 1 and Model 2, with AIC/BIC values smaller again at 170.00/176.38. The addition of one covariance between items k and x produced a model with the best fit of all models attempted (Model 4): $\chi^2(43) = 83.47$, $p < .0005$, CMIN/DF = 1.94, CFI = .92, TLI = .90 and RMSEA = .08. This model in turn fit better than Model 3: AIC/BIC = 151.47/158.05. See Table 2 for factor loadings for Models 3 and 4. The internal consistency of the single factor model as calculated by Cronbach's $\alpha = .87$.

Discussion and Conclusion

Cross-cultural Translation

Understanding the importance of including parents of Chinese heritage in cross cultural family impact research is increasing both inside and outside of Mainland China and HKSAR

(Limkakeng et al., 2013). However, in the past, when undertaking research with another culture, western research has been criticized for using survey instruments in English (Lu & Gatua, 2014). The choice of the language of the survey should not only consider participants' proficiency level, but should also take into consideration which language is normally used in discussing the research topic among the participants, as well as the impact of the language on the study. The task of establishing equivalence of cross-cultural instruments is both challenging and rewarding (Wang, Lee & Fetzer, 2006), and with a reported increase in the number of multicultural research projects conducted, the need to adapt health status measures such as the IFS, for use in other than the source language, is timely.

Although translation has been identified as the most common method of preparing instruments for cross-cultural research (Morita et al., 2012), there is no one perfect translation technique recommended to improve the semantic equivalence of cross-cultural instruments (Maneesriwongul & Dixon, 2004). Further, the cost of rigorous instrument translation including translator effort, the difficulty of establishing a suitable expert committee of equal status members, the time and effort required of those committee members, as well as participant burden, is considerable. Nonetheless, ideal cross-cultural instruments can separate the variance because of true differences in the phenomena of interest, from the variance because of cultural and linguistic differences (Yu, Scudds & Scudds, 2004). Once the true variance can be discriminated by cross-cultural instruments, interventions deemed effective in one culture can be tested and applied in a different culture.

The TCIFS was generated through a very rigorous method of translation and adaptive procedures proposed by Beaton et al. (2000), which included pretesting with interviews using a standardized protocol, as well as negotiation between local language experts, local researchers and the developer. As a result, the back translation procedures used to develop a traditional Chinese version of the IFS described in this study were rigorous enough to create an instrument that was both linguistically appropriate and culturally relevant. Further, the TCIFS pilot interviews revealed that the translation was understood as intended by participants. These steps helped to assure content and face validity.

Factor Analysis

The present CFA did not support the proposed single factor solution for the 15 item version of the IFS and subsequent EFA did not yield a conceptually interpretable solution. However, in contrast, the 11 item version of the IFS did yield a single factor solution consistent with the findings of Williams et al. (2006) and Dehn et al. (2014) and internal consistency was found to be acceptable. Nevertheless, given inconsistencies in findings regarding the factor structure of a different version of the IFS in the extant research, it is recommended that further study is undertaken to determine the TCIFS's value in its application to other developmental disability conditions.

This paper reported on the first attempt to translate the English version of the IFS into Traditional Chinese and as such, offers an important contribution to the existing literature. The revised 11 items version of the Traditional Chinese adaption of the Impact on Family Scale yielded a one factor solution with acceptable reliability. As such, the shortened version of the Impact on Family Scale has the potential to be useful for cross-cultural comparisons between the United States version (Stein and Jessop, 2003) and the Chinese traditional script version.

Researchers should expect that potential participants will be highly motivated to enroll in a study with these benefits. Unfortunately, past results have shown that as a cultural group, the Chinese population has been reticent to participate in research studies. The main reasons for non-participation by Asian American women as identified by Giarelli et al. (2011) were: lack of time, mistrust of institutions and negative experiences, lack of translated materials, feeling intimidated by English, and the lack of translation of key words or terms (p. 1055). It is hoped that a long term application of this study might increase the participation of HK Chinese parents raising children with ASD in family impact research. It is also hoped that it will be possible to explore the transferability of the results of the TCIFS data in future studies.

The collective group of HK Chinese families raising children with ASD will ultimately benefit from the individual's participation in scientific inquiry. To increase participation, in research studies for busy HK Chinese families raising a child with ASD, first one must remove language barriers in the survey instruments. Second, one must specify if the benefits for participating in research studies are directly or indirectly related to the family or cultural group. HK Chinese research participants in similar studies (author, 2014, 2016) consistently expressed that a significant motivator for agreeing to participate in research projects was their desire to be of help, in some way, to the HKSAR community in general.

The aim of the present study was to develop a Chinese traditional script version of the IFS for parents of children with ASD and to examine the internal consistency and factor structure of the translated tool. One limitation of the present study was the range of ages of the children of the participants. The age range was wide (between 3 and 18 years), making it difficult to make general statements about any particular age group. However, this diversity of age enabled a range of experiences to be represented within the study population.

Secondly, by utilizing several recruitment strategies, this study achieved a response rate of 40%. Although, this has been identified in the literature as being a good return rate for a paper based survey conducted with a Chinese heritage population (Flower-dew, 1999; Kramer, Schmalenberg, Brewer, Verran & Keller-Unger, 2009; Meredith, 2008), unfortunately, HK Chinese parents of children with disabilities are disproportionately underrepresented in the family impact literature. In Asian communities, there are many culturally received beliefs of causation of disability grounded in filial piety, karma and ancestry (Hu, Wang & Xiao, 2012). Given the large dispersion of families with children with ASD living in HKSAR, the sample size utilized in the present study (N=137) might be considered to be modest. However, the stigma of a child with ASD not being able to fulfill their filial piety to their parents in a Chinese family is judged harshly by the HKSAR society. Consequently, greater refusal to participate in research studies might be expected in surveys dealing with sensitive material which had any potential to identify that their family had a member with a disability.

There is a dearth of literature exploring how altering various factors in an experimental fashion would affect research participation in the HK Chinese culture. Understanding these families' concerns about participation in health status research would increase ethical recruitment of individuals of HK Chinese descent. Culturally appropriate research will require additional resources and additional costs of time and money. However, the ultimate benefit for the HKSAR community will outweigh these costs.

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Author's Note:

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Declaration of Interest statement

The authors and associated staff have no conflict of interest with any funding agency or in relation to use of certain survey tools. All procedures performed in studies involving human participants 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. Logistical support was provided by Hong Kong SAR NGO disability organizations. Ethical approval to conduct this study was granted by the Hong Kong Baptist University Committee on the use of Human and Animal Subjects in Teaching and Research (HASC) (IRB permission number HASC/249312). Written informed consent was obtained from all participants. Anonymity and confidentiality of participants were guaranteed.

Social Emotional Effects of Druxtastic®: A Dyadic Within-Group Drumming Pilot Program for Children with Autism Spectrum Disorder

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Abstract

Educators and practitioners working with children diagnosed with Autism Spectrum Disorder (ASD) are concerned with deficits in positive affect and social-emotional reciprocity, which may affect their daily living and school success. This pilot study explored the social-emotional impact of eight one-hour sessions of a novel dyadic within-group drumming program called Druxtastic for children with ASD at a four-week summer camp. Participants were 14 children diagnosed with ASD ranging in age from 5-14 years. Paired sample t-test revealed that children with ASD scored significantly higher on the posttest on Smiley-o-meter, $t(13) = -2.193$, $p = .047$ and Fun-o-meter, $t(13) = -2.235$, $p = .044$ when compared to their pretest scores. The Social Personal Relationship Scale showed a trend for improvement but did not elicit a statistically significant change in children's social and personal skills. These results suggest that the children with ASD significantly improved in the domains of enjoyment and fun,

and showed a positive trend for developing improved social relationships with peers and camp counselor partners.

Key words: *Autism, Drums Alive, Dyadic Drumming, Social Relationship, Affect.*

Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that effects 1 in 68 children ages 3 to 17 (CDC, 2016). Kogan et al. (2007) suggests that the prevalence rates of ASD are much higher and the true number is closer to 1 in 50. ASD is identified by persistent deficits in social communication and social interaction across multiple contexts. Deficits are manifested in social-emotional reciprocity, nonverbal communicative behaviors used for social interaction, and in developing, maintaining and understanding relationships (APA, 2013). Srinivasan, et al., (2015) noted that “socially embedded movement-based contexts are valuable in promoting imitation/praxis, interpersonal synchrony, and motor performance and should be included within the standard-of-care treatment for children with ASD” (p.1), suggesting that socio-motor skills are essential to education and intervention strategies in ASD.

Practitioners who work with children with ASD have found many social-emotional benefits from different types of gross motor skills like group drumming (Ekins et al., 2017; Guzik, Tonkin, Roberts, & Demuth, 2011; Ho, Tsao, Bloch, & Zeltzer, 2011; Kartasidou, Varsamis, & Sampsonidou, 2012; Locke & Clark, 2009). Group drumming is a recreational music making activity that builds social-emotional skills creating a collectivistic diverse culture, which can eliminate the stigma of therapy (Ho et al., 2011). Ho et al. found significant improvements in social-emotional behaviors in low-income children who engaged in contemporary drum circles and group counseling. In addition, children with intellectual disabilities and behavioral challenges who engaged in African drum circles led to positive improvements in motor coordination, memory, attention, eye contact and aggression (Locke & Clark, 2009). Moreover, children with intellectual disabilities who engaged in brain-body group drumming on large exercise balls to music, called Drums Alive® kid beats, demonstrated increased motor function, feelings of motivation, fun, concentration, and rule compliance (Ekins et al., 2017).

Another type of drumming is dyadic drumming which involves the biological concept of rhythmic entrainment, whereby two rhythmic processes interact with each other in such a way that they adjust towards and eventually ‘lock in’ to a common phase and/or periodicity (Trost et al., 2014). Another key aspect of dyadic drumming is the addition of “reciprocity” to rhythmic entrainment that focuses on socially coordinated behavior between two individuals. Dyadic drumming promotes interpersonal action synchronization (IAS) whereby two partners intentionally adapt their own timing of social behavior to the timing of others’ actions. This type of physical and social synchronization is necessary to promote success in one’s social life as individuals need to synchronize their actions in a wide range of situations and with different partners (Kleinspehn-Ammerlahn et al., 2011), especially if the rhythm is produced with “strong beat,” “high groove” music that a person is emotionally connected to. A link can be built between emotions and proprioceptive feedback (Trost, et al., 2014). Guzik et al. (2011) reported that dyadic drumming with a college partner resulted a positively impact on children with ASD’s ability to concentrate and attend to task.

The concept of IAS is in line with Vygotsky (1998)'s zone of proximal development (ZPD) theory which describes the discrepancy between the child's current level of development and the desired level of development to function in the necessary context. According to Vygotsky, development of young children occurs within a social-cultural context and there is a distance between actual development during independently solved tasks and potential development when tasks are solved under the assistance of an older and more experienced partner. Older individuals activate children's ZPD, allowing them to reach levels of performance that they would not reach without a facilitating social context (Kleinspehn-Ammerlahn, Riediger, Schmiedek, von Oertzen, Li, & Lindenberger, 2011) Using Vygotsky's perspective, dyadic drumming is considered a necessary tool of the social-culture context. Children with ASD are at-risk for developmental delays in social-emotional skills unless successful educational interventions occur. Interventions incorporating dyadic drumming may provide positive experiences for children with ASD's social, emotional and behavioral deficits. However, limited research has been conducted to investigate the effects of drumming on social-emotional development for children with ASD. Research focusing on rhythmic drumming, in a group or dyad, suggest that drumming may be a viable therapeutic intervention to address social-emotional deficits in current treatment interventions. Therefore, the purpose of this research was to pilot and investigate the effects of a four-week novel dyadic within-group drumming intervention program, Drumtastic®, on social relationships and mood for children with ASD.

Method

Participants

Participants were recruited from a four-week summer day camp for children and adolescents diagnosed with ASD. Fifty participants of the Autism Summer Camp were invited to participate in the study. Parents and guardians of participants were given a detailed description of the study before being asked to sign an informed consent approved by the Texas State University Institutional Review Board (IRB). Fourteen of the 50 participants invited met the inclusion criteria of the study. To be eligible for this study, participants needed to attend a minimum of six of the eight sessions over a four-week period. All the eligible participants were male, ages ranging from 5 to 14 years of age ($M = 10$ years). Each of the 14 participants were diagnosed with Autism Spectrum Disorder, and severity ranged from Level 1 to Level 3. The level of severity ranges from Level 1, "Requiring support," Level 2, "Requiring Substantial Support," and Level 3, "Requiring very substantial support." Six children were categorized as Level 1, seven were classified as Level 2, and one was Level 3 (APA, 2013).

Procedures

The primary investigator (PI) utilized assistance from 19 Graduate Student Mentors (GSMs) predominately therapeutic recreation students who were engaged in the assessment, planning, implementation, and evaluation of the drumming program. The PI trained these GSMs in program planning and implementation, therapeutic best practice approaches towards facilitating recreation programming with children with ASD, as well as instruction on collecting data with the instruments used in this study. GSMs collected periodic data from participants in both a pre-test–post-test format as well as intervention session-specific collection of participant data before and after each drumming intervention session. The sessions were facilitated by the PI and two GSMs all certified Drumtastic® Instructors.

Children with ASD participated in the dyadic within-group drumming intervention for four weeks with two 60-minutes sessions a week. The primary intervention used for the participants was Drums Alive Drumtastic®. Drums Alive is an evidence-based “All inclusive - No participant left behind” program that applies fitness, drumming, music, and educational concepts designed to improve social, emotional, physical and cognitive health, and well-being (Drums Alive, 2017). Throughout the four-week intervention, all participants had an assigned GSM whose role was to monitor behavior, assist in the movement, drumming, rhythmical and cognitive activities, help improve socialization skills, foster teamwork, model, assess and correct proper body mechanics and create a positive sense of social and emotional wellbeing without discouraging participation in individual or group activity.

There were three main areas of the Drumtastic® curriculum selected. The first area focused on implementation of the multi-modular protocols that combined physical education, fitness, dance, drumming, music education, mindfulness and relaxation strategies. Second, we accelerated learning through movement and rhythm exercises that supported and reinforced “Motor and Sensory Memory” through targeted and continuous incorporation of multi-sensory inputs (Sight, Sound, Smell, Touch, Emotion) to elicit immediate and measurable auditory, visual and physical feedback. Third, we facilitated engagement of productive physical and cognitive activities that enhanced neural plasticity and improved executive function.

The Drumtastic® equipment provided each participant with a large exercise stability ball (sometimes referred to as a “drum”), a large bucket to hold the ball in place during the exercises; and two pair of drumsticks (one normal set and another set adorned with scarfs). The drums were placed throughout the room in a four person “+” pod formation to accommodate all the participants and their GSMs and to create a dyadic within-group drumming experience.

Each one-hour Drumtastic® session consisted of seven sections. Section one was a five-minute warm-up that included fine motor dexterity exercises using drumsticks while participants and GSMs lightly bounced as they were seated on their exercise ball. Section two consisted of ten minutes of drumming and movement exercises on the large balls while simultaneously singing familiar songs and chants. The third section involved ten minutes of cognitive and rhythmical clapping games using the various drum equipment and visual cue cards. The fourth section was a five-minute break for recovery with participants choosing from three resting, self-soothing positions: 1) bouncing while seated on their ball, 2) laying on their stomach over their ball and rocking, or 3) supine on the floor with legs resting on their ball. The fifth section was fifteen minutes of drum and dance choreography set to music that was selected by the participants. The sixth section was ten minutes of yoga relaxation exercises with participants laying on, or rolling up in, yoga mats while engaged in deep breathing protocols and receiving a carefully monitored GSM massage using lavender scented oil. Section seven, the final section, was a cool down period five minutes in duration. Participants were seated alongside their GSM on a yoga mat, sharing in the closing session with yoga stretches, rhythmical Kirtan Kriya chanting and “call and response” positive affirmations.

Instruments

Observational data was collected before and after the eight sessions by each participant’s GSM using the Social and Personal Relationship Scale (SPRS). The SPRS was piloted for this study

and based on the goals of the Drumtastic® curriculum. This assessment provided information regarding the participant's demonstration of pro-social emotive responses and pro-social adaptive skills. The SPRS includes 20 items measured on a five-point Likert-scale which describe the child's pro-social affect presentation (e.g., respect for others, appreciates others' performances) as well as each participant's demonstration of pro-social behaviors (e.g. shows concern when others are upset, participates as a follower).

In addition, GSMs used modified elements of Read, MacFarlane, and Casey's (2002) Fun Toolkit. The modified Fun Toolkit was used to provide participants the opportunity to give meaningful feedback as to their level of enjoyment in the activity. Instrumentation used from this toolkit included the use of the "Smiley-o-meter" and the "Fun-o-meter." The "Smiley-o-meter" consisted of five visual smiley "emoji" faces depicting feelings on a horizontal enlarged board outside the drumming room. The "Fun-o-meter" had the same five emoji faces only in a vertical thermometer enlarged board posted outside the drum room. The children were asked by their GSM to point or stand next to the emoji face that represented how they felt before and after each drum session. Both tools were used to compare the accuracy and usability of these scales with the participants. GSMs recorded these scores before and after each session and the scores they believed were most accurately represented the child's level of enjoyment. comparison.

In the second week of the pilot study, GSMs noted that many of the participants requested scores greater than allowed on the five-emoji face Smiley-o-meter indicative of the ceiling effect, thus a newer Smiley-o-meter was developed with eight emoji faces that ranged from Frustrated/Angry to Excited. Another change adopted at the same time was to discontinue the use of the fun-o-meter. GSMs noted that some of the participants were unable to physically reach all of the emoji faces, limiting them from choosing emoji faces higher on the meter. The eight-visual emoji smiley-o-meter gave researchers greater accuracy choice and more effectively covered the range of emotions continuum for the participants, thereby improving the validity of the scales. (Krosnick & Presser 2010) describes this on two of the four points he noted in his book in the chapter titled "Number of points on rating scales." "First, the points offered should cover the entire measurement continuum, leaving out no regions. Second, these points must appear to be ordinal, progressing from one end of a continuum to the other, and the meanings of adjacent points should not overlap."

Facilitator-derived data collection was augmented by parental/ guardian's feedback before and after the eight-session intervention using the Positive and Negative Affect Schedule for Children (PANAS-C; Laurent et al., 1999). The PANAS-C parent version includes a 20-item inventory of both positive affective terms (e.g., energetic, happy, joyful), as well as negative affective terms (e.g., lonely, mad, scared; (Ebesutani, Smith, Reise, Higa-McMillan, & Chorpita, 2012). Each affect item is Likert rated one to five; a score of one indicating that the affect is very slightly or not at all present, and a score of five indicating that the affect is "extremely" present. When reporting on the extent of each affective term, parents were directed to consider the last several weeks of the young person's affect when selecting responses for their child.

Data Analysis

Descriptive analyses were used to analyze children's performance on Smiley 5, Smiley 8, Fun, and SPRS overall scores before and after the 8-session of intervention. Emoji faces were used

and corresponded with a number to obtain the Smiley raw scores. A Likert Scale was used to measure the SPRS raw scores and 20 affective characteristics were measured. Paired sample *t*-tests were conducted on the Smiley 5, Smiley 8, Fun, and SPRS scores to examine the significant differences between pre-and post-tests. Results were considered significant when alpha value was less than .05. Effect sizes (ES) was calculated for practical significance using Cohen's *d* (Cohen, 1988).

Results

Descriptive statistics showed that children with ASD had higher overall scores in the post-test when compared to their pre-test scores on Smiley 5, Smiley 8, Fun, and SPRS after 8 sessions of intervention. The paired sample *t*-test revealed that children with ASD scored significantly higher on the posttest in Smiley 8, $t(13) = -2.193$, $p=.047$ and Fun, $t(13) = -2.235$, $p=.044$ when compared to their pretest scores. Children improved 9% in Smiley and 5% in Fun in their post-test. However, no statistical significant differences were found on Smiley 5 and SPRS. These findings suggested that drumming activities improved children with ASD's fun and enjoyment after eight sessions of intervention. Participants' significant pre-test and post-test improvement is presented in Figure 1.

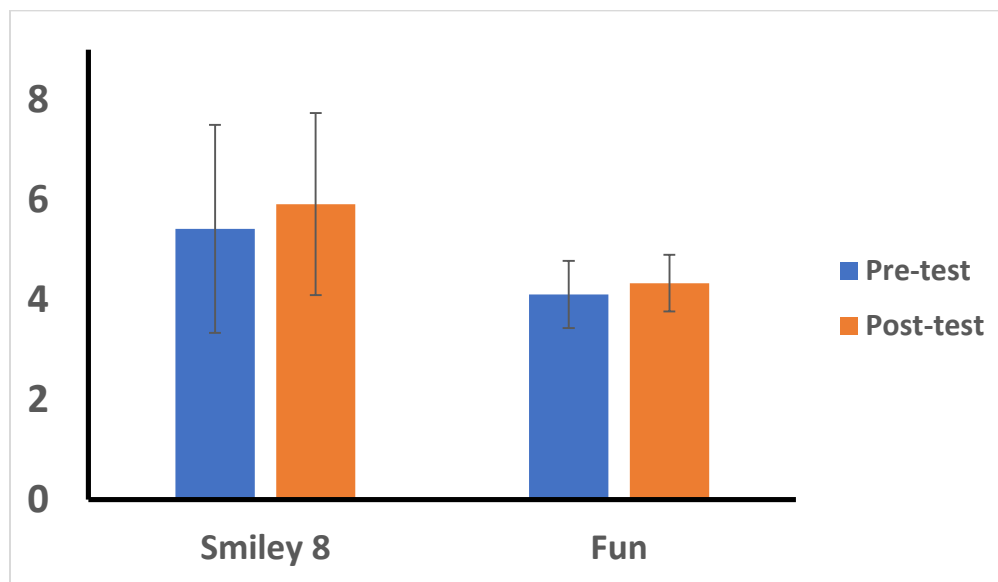


Figure 1. Smiley 8 and Fun after the eight-week intervention.

The effect sizes (ES) describing the children with ASD pre-test and post-test performance differences were moderate on smiley 8 ($ES = -.25$) and fun ($ES = -.36$). The medium ES results suggest that the true effect of the pre-test and post-test differences in the populations might be medium.

Discussion

This pilot study explored the effects of a novel dyadic within-group drumming intervention program on social-emotional skills of children with ASD. The children in the summer camp program significantly improved in the domains of enjoyment and fun, and showed a positive trend for developing improved social relationships with peers and camp counselor partners. The results of this study suggest that this type of alternative therapy may be used to effectively

mitigate some of the social-emotional difficulties of children with ASD in a fun, non-stigmatizing energetic environment. This is important because as children with ASD develop into adolescents, this type of drumming activities can be a segway to build relationships amongst inclusive peers (Ho et al., 2011).

Our findings were in support of Vygotsky (1998)'s ZPD theory that learning takes place with other individuals in the environment. The effectiveness of the intervention maybe due to the combination of key aspects of the drumming program including dyadic within-group drumming formation, inclusion of an intergenerational partner (GSM), and a consistent routine including: familiar songs, rhythmical clapping and cognitive games, and movement to music drum choreography. The use of dyadic within-group drumming partnerships promoted the formation of social relationships by reinforcing the biological construct of reciprocal rhythmic entrainment at the motor and social levels (Kleinspehn-Ammerlahn et al., 2011; Trost et al., 2014). Research on dyads in drumming and physical activity confirm that there is a social relationship factor that is reciprocal in nature and may contribute to improved activity participation in a cooperative manner with another person (Kleinspehn-Ammerlahn et al.; Lopes, Gabbard, & Rodrigues, 2016). Furthermore, since reciprocal rhythmic entrainment is an important component of emotional connection to music, perhaps the use of "strong beat" "high groove" music that was self-selected by our participants led to improving their enjoyable and fun drum experience (Trost et al., 2014).

Furthermore, an intergenerational more experienced college partner (GSM) was added to the dyadic within-group drumming to meet children's needs amongst a larger rhythmical group ensemble. This change conformed to Vygotsky (1998)'s ZPD theory whereby two people working together have a greater potential to achieve levels of performance they otherwise would not. Therefore, our study supports the use of the educational ZPD concept in play, creating a new type of learning environment building on the connection between kinesthetic experiential movement and cognition (Guzic, et al., 2011; Hannaford, 2005; Kleinspehn-Ammerlahn et al., 2011). In addition, our findings are in line with Reinders, Fletcher, & Bryden, (2015) and Guzic et al., who also employed college student partners to dance and drum with children with ASD. This one-to-one partner showed significant activity engagement for each participant because they received constant help and attention as needed.

The strength of the intervention was reflected in the effectiveness of our protocol derived from the main focus areas of the Drumtastic® program comprised of singing, games, rhythmical clapping, and full body choreography movements while drumming (Drums Alive, 2017). Researchers suggest that when working with children with Intellectual and Developmental Disorders (IDD) and ASD, the most critical components for success are listening, singing, music-making, and rhythmic actions synchronized to music, experienced in individual or socially embedded, dyadic, and group activities (Ekins et al., 2017; Locke & Clark, 2009; Srinivasan & Bhat, 2013). This type of multisystem treatment tool may be a contributing factor to the trend for improved social relationship and enjoyable affect found in our study. The research of Ekins et al. and Locke and Clark give interesting results regarding the significant enjoyable experience of their young participants with IDD who engaged in Drumtastic® and African group drumming respectively. Their findings suggest that it is the unique aspect of drumming to the same beat, in a social group setting that contributed to their additional significant changes in motor

coordination, memory, engagement (eye contact), aggression impulse control, and listening that children with special needs respond positively to. This suggests the need to further investigate this Drumtastic® protocol beyond this pilot study.

Research in both neuroscience and socio-emotional development show that movement to music, such as dance, has additional benefits that go beyond traditional learning. The strategic use of drum choreography with dance type movements were a main part of our protocol that finds support in the dance and movement to music research (Bonbright Bradley, & Dooling, 2013; Gonzalez, 2015; Paulson, 2002; Pierman, 2016; Reinders, Fletcher, & Bryden, 2015). Paulson (2002), for example, argues that learning and performing activities physically changes the brain due to plasticity, and it is possible to use dance to create new neurological pathways for learning. When participants engage in dance or rhythmical movement, such as drum choreography, they activate multiple systems in the brain. Furthermore, dance inspires emotion, and because emotion stays linked to learning, the dance-elicited emotion is a powerful learning tool. In addition, Pierman's "Dancing for Development" program was correlated with gains in all three areas of development in socio-emotional, cognitive, and motor domains. In our study, we asked participants to come up with their own signature drum moves during the game portion of the program to promote cognitive self-creativity, social awareness, and learning.

Central to Bonbright, et al. (2013) and Overy and Molnar-Szakacs (2009) research, dance stimulates mirror neurons (i.e., neurons in the brain that activate both when one performs an action and when one sees another person performing the same action). In our drum choreography, participants watched the demonstration of movement before they attempted it themselves which is similar to dance instruction. Because mirror neurons are activated in both cases, learning can happen more quickly and effectively. Mirror neurons have also been related to the development of empathy in children. In mirroring exercises, students imitate one another while they express themselves through movement. Specifically designed for children with ASD, Gonzalez incorporated in her program the goal of improving "social skills such as listening, taking turns, greeting and parting, and making eye contact" (2015, p. 16). Her class structure was highly regulated to provide a consistent routine which was also a strategic focus of our program as this has been shown to be crucial for children with ASD. Conceivably, this may be the reason for the changes in social-emotional behaviors in our study.

There were some general limitations to our study. The nature of pilot studies themselves limit the generalizability of the findings due to the small sample size and a lack of a control group. Thus, our findings act as suggestions for further research. In addition, we were piloting a new SPRS based on the specifics of the Drumtastic® program components, thus the lack of significant changes in social relationships may have not been adequately captured by this new instrument. Furthermore, the lack of findings on the PANAS-C completed by the parents of the participants before and after the eight drum sessions could be explained by non-transferable behavior changes outside the camp setting.

Conclusion

In summary, educators and therapists have long understood the connection of rhythmic movement, learning, and growth (Hannaford, 2005). Kinesthetic activities have the power to unlock cognitive processes which otherwise remained trapped or inaccessible (Kartasidou, et al,

2012). The viewpoint taken in this study supports other research that there are less stigmatizing therapies that can maximize whole brain impact through incorporating strategic drumming movement to music through dyadic partnerships for children with ASD.

Conclusively, this pilot research indicates that there is a positive social-emotional effect of dyadic within-group drumming with an intergenerational partner (GSM) for children with ASD. Such skills and abilities are critical to positive and lasting inclusion of children with intellectual disabilities into recreational pursuits with their peers (Siperstein, Glick, & Parker, 2009).

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Level of Support by Collaborator Teacher for Field Training in Special Education at Jordanian Universities

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Abstract

This study aimed to establish the degree of support offered by collaborator teachers in special education from the perspective of teacher trainees, and its relationship with variables of student' gender and GPA level, in Jordan. The answers to a valid and reliable questionnaire of 30 items of 183 subjects (males and females) in field training provided the

data for this study. The study found that the level of support presented by collaborator teachers for field training, in general, was average. A statistically significant difference ($\alpha \leq 0.05$) in the level of support was due to the variable of gender of students, in favor of females.

Keywords: *level of support, collaborator teacher, field training students, specialization of special education, Jordanian Universities*

Introduction

Field training programs constitute the basic building block of the application of knowledge, skills and theoretical strategies the student has acquired during his/her study of the major courses in special education.

In general, field training results in lots of pressure for most students in the educational fields, as the students try to turn theory into practice. And, in spite of the importance of field training the extent to which the student received the appropriate training and method implementation is still unknown (Begeny & Marten, 2006). Many researches and practitioners agree on assuming that the student's study of different theoretical academic courses does not guarantee successful practice of the teaching profession (Black and Halliwell, 2000). Therefore, we would rely on the training program that poses the final ring of a series of teacher preparation programs (Almakanin, 2015).

The field training programs in special education seek to enable trainee students, and develop their perceptions and knowledge, concerning the basic concepts of teaching students with disabilities, such as, real teaching experiences, identifying the learners' growth stages, its natural and unnatural indicators; managing the individual differences among the students during the teaching process. The concepts also include availing teaching opportunities proportional to these differences; planning the teaching process according to the results of the evaluation and diagnosis, in a way that suits the needs and characteristics of the learners, and supports the employment of teaching strategies that booster the students' development, and provides methods of problem solving and performance skills. Moreover, they include application of the behavior management skills through the preparation of a learning environment that encourages the positive social interaction and effective participation in the learning process (CEC, The Council of Exceptional Children).

The criterion for the field training quality forms one of the most important standards set by the National Council for Accreditation of Teacher Education (NCATE). This criterion has many related sub-dimensions, such as level of partnership between the schools and teacher preparation institution to provide field services, implement and evaluate them in a manner that helps student teacher develop their knowledge, skills and necessary trends in the teaching system (NCATE, 2000).

As such, for the programs to succeed, the principle of the profession based on partnerships should be established and rooted between the teacher preparation institutions,

such as institutes and universities, on one hand, and the local training institutions, on the other. Furthermore, many other elements should be readily available for the success of these programs, such as providing moral support by the participant teachers (collaborators) in field training; developing the positive relationship between the student teacher and collaborating teachers; size of the burden on the student teacher; harmony in the educational content related to the curricula, educational programs and teaching methods. There are also additional factors, such as feedback, which affect the teacher- student achievement during the training period, in particular. This is especially important once these programs are offered through humanitarian and ethical ways, to guarantee the benefit of the teacher-student of the academic knowledge within a social vocational context (Beck, 2002).

Field training programs are based on several parties that include special education department, field training supervisor, the trainee student, the collaborating school and the collaborating teacher. Thus, it is a must to assess these programs and know their positive and negative aspects; the challenges they face to know the reality of the roles of the parties involved in training, to realize the required vocational training, and prepare the desired special education teacher. This is particularly of vital significance, given that the role of the collaborating teacher is one of the most important and influential elements in the educational process. It has a major role in assisting the trainee students to face the problems they may encounter, the most important of which was termed in the educational literature "*The Reality Shock*", through discussing the problems, identifying the curricula, teaching methods, planning ways, application and implementation styles, and the use of modern techniques in teaching.

Thereupon, no wonder if the modern educational systems place utmost attention to the teacher, such as methods for selecting him/her, teachers' building and training programs, based on the notion that all the educational reforms are subject to the reformation of the workers' quality and personality in this field (Abu Shandi, Abu Shaireh & Ighbari, 2009). This made the effectiveness and quality of the field education in the special education departments rely, in one of its dimensions, on the vocational support and booster level, provided by the field education institution, through its collaborating teachers, whether such institutions were a training institute, special center for disability or mainstreaming education program.

In the light of the above, many studies targeted exploring the role of the collaborator teacher in building the trainee students on the knowledge, skills and behavior. For instance, Al-Oqool (2012) conducted a study aimed to identify the role of the collaborator teacher in the application schools as viewed by the teacher students in King Saud University. The study showed that the collaborator teacher is performing the role assigned to him satisfactorily, in the domains of the teacher students' interaction with the school life and school activities. On the other hand, it showed low satisfaction level in the follow-up of the collaborator teachers of the academic performance of the teacher students. The study concluded that the collaborator teacher should perform the roles assigned to him in a better manner; and assume the supervision process, which is currently assigned to the collaborator teacher, to teachers of high experience and skills in the area of the educational work. The study of Al-Sha'er (2011) showed a difference in the means of the effectiveness degree of the teacher's role in the educational process in the Jerusalem Open University, as practically viewed by students in

the Bethlehem area, attributed to the gender variable, in favor of the males. There were other differences attributed to the specialization variable, in favor of English Language. The results of Al-Abbadi study (2007) showed that the college supervisor performed the role required from him, and the school principal performed the role assigned to her at low degrees; and the collaborator teacher performed the role assigned to her at a medium degree. In addition, the results showed disadvantages in the practical training programs and the college procedures. Finally, the study showed statistically significant differences between the viewpoints of the learner students in their assessment of the supervisor's role and the collaborator female teacher's role and the college procedures, attributed to the specialization variable.

Al-Qasem's study (2007) aimed at identifying the problems that preclude the training of the teacher students in the practical education program in the Jerusalem Open University. The results showed that availability of the potentials domain ranked first among other axis, in terms of the appearance of problems; meanwhile the collaboration axis by the part of the collaborator teacher ranked last. The results did not show statistically significant differences attributed to the teacher student's gender; but there are statistically significant differences attributed to the specialization of the teacher student, in favor of the elementary education and Arabic language. Finally, there were statistically significant differences attributed to the educational district, in favor of Nablus district.

Rashid and Al-Shabbal study (2006) showed that the role of the collaborator teacher in all the practical educational areas was good, and the most positive practical education, in terms of the role of the collaborator teacher, was the classroom environment and supplies domain. While the least positive areas were the both the evaluation methods and teaching materials, which indicated that the role of the collaborator teacher in guiding the teacher student was acceptable. The results did not show statistically significant differences in the role of the collaborator teacher, in guiding the teacher student in the practical education, as viewed by the class teacher students, attributable to their gender, stream of their secondary education, and their accumulative average variables.

Attar and Kinsara (2005) conducted a study, which results showed that the benefit from the collaborator teacher in the area of using the teaching aids, as viewed by the teacher students in Umm Alqura University and Teachers College, Mecca Mukarramah, was high. The results further showed statistically significant differences in the benefit from the collaborator teacher in the teaching aids area, attributable to the experience variable, in favor of those over ten years of experience. Ambabi's study (2002) showed lack of sufficient collaboration from the class teacher, misguidance and lack of attempts to establish friendly relations with the teacher student. The study further showed that the (teacher trainees) were assigned to fill lessons, which are originally allocated for the in-service teachers, carry out administrative works, and not allowing them attend lectures in the college.

Al-Sho'awan (2000) conducted a study aimed at defining the degree of participation of the collaborator teacher in the field education, as viewed by the school principals and the trainee students. The results showed that the degree of involvement of the collaborator teacher in the field training was medium, in general. His participation was mostly present in the emotional aspect, while his degree of involvement in the vocational aspect was less than that of the emotional. The results further showed statistically significant differences, in favor

of the school principals, and other differences among the results of both the emotional and vocational dimensions, in favor of the former. The study also concluded that there is a need to increase attention to the role of the collaborator teacher in field education, and conduct similar research that takes into account exploring the role of the teacher, in the light of educational variables not included in this study.

Al-Ajjaji (1997) made a study which showed that only 16% of the sample participants were highly satisfied with their role toward the teacher student. Meanwhile, 47% of the participants showed medium satisfaction degree of their roles; and that 44% of the teachers take part in evaluating the teacher student. On the other hand, over 46% of the teachers indicated their non-involvement in the evaluation process. As for the nature of the relationship between the collaborator teacher and the teacher student and college supervisor, the results showed that 60% of the teachers of the sample reported that their relationship with the teacher student was good. Meanwhile, the results showed a poor relation between the collaborator teacher and the college supervisor.

Results of the study of Kathy and Nadine (1995) showed that the collaborator teacher provides valuable assistances to the trainee student, particularly in providing him freedom and encouragement in finding the modern teaching methods and styles. Finally, the study of Al-Qahtani (1994) showed that the role of the collaborator teacher was relatively moderate in providing the teacher student classroom management skills, teaching skills and evaluation; and introducing him to the school management, system and examinations. Yet, the results showed shortcomings of the teacher student's performance, which might be due to the fact that he did not know the role he would perform. In this regard, the role of the collaborator teacher does not go beyond offering certain simple contributions. For instance, receiving the trainee student in the beginning of the training stage. As a result, the study recommended the necessity of preparing the collaborator teacher, to be aware of the nature of the role assigned to him.

In the light of the results of the previous studies, it is clear that there is a fluctuation in these results concerning the role of the collaborator teacher. Some studies emphasized the role of the collaborator teacher in providing support to the trainee students; others assert lack of or poor role of the collaborator teacher. Here the position of the current study becomes sufficiently clear in its serious attempt to investigate the role of the collaborator teacher in a practical cognitive area, not particularly addressed by previous studies. The area of the field training, specifically in special education, imposes the need to find out the role of the collaborator teacher, due to the very privacy of this field domain, as it targets preparing the students with different specialty in dealing with special categories in mental, cognitive, behavioral and physical aspects.

Study Problem and Questions

Researchers noted, in the light of their experience in the academic teaching domain, field supervision, close knowledge of the field-training course in special education, obscurity surrounding the role of the collaborator teacher, and in the learning resource rooms, which collaborate with the special education departments in the Jordanian universities. Particularly, there is a recurrent complaint of the field-training students from the poor cooperation and

support provided by the collaborating institutions, most apparent in the poor role of the collaborator teacher in supporting the trainee students. This was further assured by Taskin (2006), who found that the trainee students, in certain practical training situations, find out that their opportunities to obtain the actual teaching experiences is almost very close to zero. In addition, results of the revision of many related studies on the assessment of the practical education programs, and identifying the problems of the teacher students, during the field training period, were similar to the results of our study. For instance, Al-Zaidi (2016); Al-Ja'afreh& Al-Qatawneh (2011); Al-Ajez and Halas (2011); Mahaftheh (2008); Al-Tarawneh& Al-Huwaimel (2008); Al-Hind (2006); Alabbadi (2004); Abu Nimreh (2003); Alqow (2001); Al-Agha (2000) and Guyton & McIntyre (1996). All of which showed shortages in the collaborator teacher's assistance to the teacher trainee student; a case that may lead to that the trainee student would not appreciate the collaborator student; in addition to the inefficiency of the collaborator teacher, and his poor role in supporting the trainee students.

In order not to allow an inevitable fact that the role of the collaborator teacher is weak in the special education domain, specifically, based on the recurrent students' complaints, this study was made. The main objective of this study was to identify the level of the collaborator teacher's support to the special education major students, during their field training courses in the special education institutions. It also aimed at revealing the fact that this support provided by the study population was not addressed before in the previous studies. In this concern, the aim is to identify the factual role of the collaborator teacher, as one of the participant parties in the field training programs, as seen by the field-training students; who are the closest to the collaborator teacher's role, being in his classroom on a daily basis. They are very close to him, and the most capable to identify the actual professional role through him. In addition, this study also aimed at measuring the effect of the trainee student-related variables, i.e. gender, accumulative average, and collaborator teacher-related variables, i.e. gender, academic, academic degree and experience.

In the light of the above, and more specifically, the study problem is clear in its attempt to answer the following questions:

- 1- What is the level of support offered by the collaborator teacher to the field-training students in special education major at the Jordanian universities?
- 2- Are there statistically significant differences in the support level of the collaborator teacher to the field-training students in special education major in the Jordanian universities, attributable to student gender and GPA level?

Importance of the Study

The importance of this study is represented in two aspects, one is the theoretical and the other is the empirical. In the theoretical domain, the study is a scientific research effort to reveal the actuality of the collaborator teacher's role in implementing the field training procedures, which are directed to the special education major students. To the best knowledge of the researchers, this topic was not clarified or identified in many of the previous studies, which were conducted to explore the role of the collaborator teacher. In spite of the large amounts of the readily available research works on the educational

specializations, yet, special education remained largely limited to the theoretical issues; no study was conducted to invest in the training, practical field sufficiently. This may be one of the reasons of conducting this study, which results form an actual opportunity to evaluate the support level of the collaborator teacher, as a main factor in the field-training programs.

On the practical aspect, it is hoped that the results of this study will benefit in assessing the field training programs, and improve the training level provided by the collaborator teacher in the field-training institutions, to provide the best training conditions to the trainee student. In addition, the study instrument is of vital importance in assessing the role of the collaborator teacher, and the possibility of utilizing the results of the current study to construct various training programs for the collaborator teachers.

Method

The researchers employed the descriptive method to identify the support level of the collaborator teacher to the field-training students specialized in special education in the Jordanian universities as seen by the trainee students and its relation with certain variables.

Study Population and Sample

The study population consisted of all the special education major students in the Jordanian universities, who are already enrolled for the field-training course in the second semester of the academic year 2015/2016 (n=583 male and female students). The students are assigned by their universities for training in the special education centers and resources rooms, of both the public and private sectors, which are designated as collaborators in the field-training. The study sample consisted of (183) male and female students, representing (31%) of the total study population, who were randomly chosen. Tables (1) and (2) illustrate this.

Table 1. Distribution of the Sample Participants by Students Gender and GPA level Variables

Variables		No	%
Gender	Male	60	33
	Female	123	67
GPA level	Excellent	18	10
	Very Good	67	37
	Good	66	36
	Acceptable	32	17
Total		183	100

Study Instrument

The researchers developed a measurement instrument to measure the role of the collaborator teacher's support to the students in special education, during their field training. The instrument consisted of 30 items distributed on a graded answer scale from (1-5) degrees, in compliance with Likert five-point grading scale. The degrees were as follows: Always= 5

points; often=4 points; sometimes=3 points; rarely=2 points; and never= 1 point. The researches adopted the following scale to judge the satisfaction degree of the items:

- Low level: 1-2.33
- Medium/moderate level: 2.34-3.66
- High level: 3.67-5.00

This measure was achieved through dividing the range into three categories: $\{(5-1)/3=1.33\}$.

Validity of the Instrument

Following to the construction of the instrument in its initial form, the researchers verified its validity in two ways: content validity and construction validity. The functions of the content validity were verified by presenting the instrument to 11 arbitrators, who are faculty members of the following universities: Hashemite University, University of Jordan, Balqa' Applied University, Tafila Technical University. In addition to the above arbitrators, five highly experienced, efficient, and capable collaborator teachers in the domain of field training, were selected to be arbitrators. They were all requested to review the items, judge them and identify their suitability to the study objectives, and state their views on the clarity and belonging of the items; so that the validity of the content and construction of the instrument be achieved. The arbitrators made a consensus judgment that the items belong to the study objectives. Their comments, following to the retrieval of the instruments, showed a (100%) consensus agreement on keeping all the items as they are. However, the remaining of their comments were on paraphrasing some items such as (19,27 and 28) and replacement of certain vocabularies by clearer ones.

Instrument Reliability

The researchers used Chronbach Alfa equation to calculate the reliability of the instrument. The results of the analysis showed high reliability degrees of the instrument (0.89). This result was pursuant to the performance of 24 male and female trainee students, from outside the sample, who are enrolled in the field training course in three main universities; the Hashemite University, University of Jordan and Balqa' Applied University, at the rate of eight students per each.

Procedures

To realize the study objectives, the researchers applied the following procedures:

- Review of the in-depth theoretical literature related to the collaborator teacher, within the framework of the practical education, for the preparation of the study instrument.
- Construct the instrument that takes into consideration the roles of the collaborator teachers in the special education area, and the privacy of the roles expected of them.
- Present the instrument to a pool of arbitrators and experts of the faculty members and neutral teachers, whose schools were not targeted by this study to include any of the trainee students.

- Call the field-training students in special education in the targeted universities, individually, for a general meeting, to get them aware of the importance of the current study. They were also informed the vitality of responding objectively; and the entailed effects of their results of the evaluation of the nature of the anticipated roles of one of the most important collaborator parties in the special education area.
- Distribute the instrument over the sample participants, who did not participate in the reliability sample. The students were given sufficient time to answer the items. The researchers collected the instrument after making sure of the completion of the responses on the items.
- Carry out the relevant statistical analyses and obtaining the results.

Statistical Processing

To answer the first question of the study, the researchers used the means and standard deviations. On the other hand, for answering the second question, they used the t-test and one-way ANOVA analysis.

Results and Discussion

Question one: "What is the level of support of the collaborator teacher to the field-training students in special education major in the Jordanian universities?"

To answer this question, the researchers obtained the M's and SD's of the measure of the collaborator teacher's support level to the field training students in special education major in the Jordanian universities, as illustrated in Table (2).

Table 2. M's and SD's of the Collaborator Teacher's Support Level to the Field Training Students in Special Education Specialization in the Jordanian Universities Arranged in a Descending Order.

No.	Rank	Item	M	SD	Degree
22	1	The teacher helps me develop the individual educational plan and goal coining.	3.39	2.693	Medium
12	2	The teacher provides chances for selecting the theory, practice and application in the class.	3.07	0.836	Medium
3	3	The teachers check my field-training plan and follows-up its implementation.	3.05	0.930	Medium
14	4	The teacher cooperates with the training supervisor in the University, and informs him the course of the training process (what is	3.04	0.880	Medium

		achieved and not yet achieved)			
5	5	The teacher provides me forms of education (teaching, training) which avail me a chance to learn about his experience and methods.	3.02	0.815	Medium
4	6	The teacher provides me the teaching aids and necessary instruments I need.	3.00	0.877	Medium
11	7	The teacher calls me to adopt positive attitudes towards the student and the teaching profession.	3.00	0.883	Medium
9	8	The teacher encourages me to cooperate with the multidiscipline team members, and pushes me to an active communication with them.	2.99	0.866	Medium
8	9	The teacher provides me feedback about my performance, regularly.	2.97	0.811	Medium
15	10	The teacher avails to me opportunities to engage in educational activities and assigns to me certain tasks during these activities.	2.93	0.843	Medium
16	11	The teachers provide me sufficient information about the students.	2.93	0.753	Medium
6	12	The teacher shows me pattern of the child's performance.	2.92	0.788	Medium
2	13	The teacher facilitates to me integrating with the working cadre in the institution.	2.91	1.678	Medium
7	14	The teacher tolerates my stumbling in training- if occurred- directs and guides me.	2.90	0.815	Medium
13	15	The teacher calls me to use the available learning resources in the institution.	2.89	0.860	Medium
1	16	The teacher explains to me the work system in the institution, and provides me directives.	2.83	0.749	Medium
17	17	The teacher shows me the students' record and files.	2.79	0.749	Medium
19	18	The teacher helps me analyze and interpret the	2.63	1.311	Medium

18	19	results of the exams and nature of the data obtained. The teacher avails to me the exams used to evaluate the children, and directs me how to use them.	2.56	1.207	Medium
20	20	The teacher helps me in writing the report for the child's evaluation and progress.	2.50	1.342	Medium
30	21	The teacher guides me to the necessity of knowing the profession standards and adherence to them.	2.49	1.257	Medium
23	22	The teacher helps me in developing and implementing the individual educational plan.	2.44	1.336	Medium
24	23	The teacher assists me in planning for the behavior management programs.	2.42	1.327	Medium
25	24	The teacher helps me in the use of the active behavior management methods.	2.41	1.297	Medium
10	25	The teacher facilitates to me communications with the child's family and encourages me do so.	2.38	1.324	Medium
27	26	The teacher helps me overcome the problems that face me within the training framework.	2.35	1.283	Medium
29	27	The teacher allows me carrying out amendments and adaptations required for the learning environment and task presentations.	2.30	1.263	Poor
21	28	The teacher gradually makes me hold the student's teaching responsibility in the classroom.	2.25	1.319	Poor
28	29	The teacher accepts my suggestions and allows me assign my viewpoint in certain discussions.	2.15	1.217	Poor
26	30	The teacher assists me in developing and preparing the required teaching aids.	2.15	1.253	Poor
Total			2.72	0.782	Medium

Table 2 illustrates that the level of the collaborator teacher's support to the field training students specialized in special education, at the Jordanian universities was medium, with (2.72) overall mean. The means ranged between 2.15 and 3.39, with the item providing, "The teacher helps me develop the individual educational plan and goal coining", ranking first with a (3.29) mean and medium support level. The researchers attribute this result to that the development of the individual educational plan and goal coining represent the base of work with the disabled individuals, in the different special education institutions. This requires providing support to the trainee students in building the individual educational programs, which form the foundations for building the subsequent individual educational plans. This result is in line with the study of Al-Abbadi (2007), which indicated that the collaborator teacher carries out the required role at a medium level. This result is also in line with the studies of Al-Sha'awan (2000), Al-Qahtani (1994), and Al-Qasem (2007), which all indicated that the focus of collaboration by the part of the teacher was high. This result further came in the last rank among the problems that may impede the students' training.

As for the poor assistance provided by the collaborator teacher to field training students, in the domain of developing and preparing the required educational aids, it ranked last, with (2.15) mean, the lowest of all the items. The researchers ascribe this to the persuasion of the collaborator teachers in the ability of the trainee students to design and produce the required educational aids. Particularly, because these students had taken courses on these topics in the university, which are designed for this purpose. Accordingly, the field-training students are not in need for further clarification or guidance in this concern. This result agrees with those of Al-Aajez and Halas (2011) and Al-Abbadi (2004), which both reported that the most frequent problems facing the trainee students is the rarity of the educational aids, and difficulty in providing them in the collaborator school, as well as the poor support for producing them. Moreover, this result is in agreement with that of Imbabi (2002), which indicated the insufficient cooperation of the collaborator teacher with the field-training students, especially in preparing the aids, which is one of the cooperation domains the teacher should support. On the other hand, this study is not in line with that of Al-Attar and Kinsara (2005), which indicated that the benefit provided by the collaborator teacher in the area of utilizing the educational aids, as seen by the trainee students, was high.

Question two: Are there statistically significant differences in the support level of the collaborator teacher to the field-training students in special education major in the Jordanian universities, attributable to trainee student gender and GPA level?

To answer this question, the researches obtained the M's and SD's of the support level of the collaborator teacher to the field training students, who are specialized in special education in the Jordanian universities, by the student's gender and GPA level. Table (3) illustrates this.

Table 3. M'S and SD's of the Collaborator Teacher's Support Level to the Field-Training Students, by Gender and GPA level

Variable	Level of Support			
	Number		Mean	Standard Deviation
Gender	Male	60	2.42	0.68

GPA level	Female	123	2.86	0.78
	Excellent	18	2.97	0.87
	Very Good	67	2.61	0.77
	Good	66	2.83	0.77
	Acceptable	32	2.57	0.71

Table 3 indicates statistically significant differences in the means and standard deviations among the variables of the study (gender and GPA level), in the support level of the collaborator teacher. To account for these differences, the t-test was applied to identify the differences by gender variable and the one-way ANOVA of the GPA level variable, as explicitly shown in Table No. (4).

Table 4. Analysis of T-test Variance of the Collaborator Teacher's Support Level to the Special Education Trainee Students by Gender

Variable	Gender	M	D f	F Value	Significance
Level of Support	Males (n=60)	2.42	181	-3.750	.000
	Females (n=123)	2.86			

Table 4 shows statistically significant differences in the support level of the collaborator teacher to the training of special education students, by the gender of the students. The differences were in favor of the female students, with a (2.42) mean. On the other hand, the mean of the male students was (2.86) with (-3.750) F value, which is statistically significant at ($\alpha=0.05$) level. The researchers attribute the result to that the female students are more interested in the field training and implementing its requirements to the best possible level. This always reflects care and attention of their female teachers for the necessity of supporting and training the female trainee students. Meanwhile, most of the male students do not show the required level of attention and interest in the field training, and thus the student is not careful to evaluate the collaborator teacher's support level. This result is not in line with that of Al-Sha'er (2010), which results showed statistically significant differences in the activity level of the collaborator teacher in the practical education in Jerusalem Open University from the viewpoint of the practical education students, attributed to the gender variable, which was in favor of the males. On the other hand, our study is also not in line with that of Al-Jaafreh and Al-Qatawneh (2011), which did not show statistically significant differences in the factuality of the practical education attributed to the gender variable. Table 5 illustrates this.

Table 5. Results of the One-Way ANOVA of the Collaborator Teacher's Support Level to the Field Training Students by the GPA level Variable

Variable	Variance Source	Total Squares	D f	Squares Mean	F Value	Sig.
Level of Support	Between group	3.622	3	1.207		
	Within group	107.538	179	0.601	2.009	0.11
	Total	111.159	182			

The above table shows that there are no statistically significant differences in the support level of the collaborator teacher to the special education teacher trainees, attributed to

the students' GPA level. The researcher ascribes this to the fact that the objective estimation of the collaborator teacher's support level does not necessitate possession of a certain level of the GPA. This result is not in line with that of Al-Ja'afreh (2011), which results showed statistically significant differences in the reality of the practical education, attributable to the GPA level, in favor of those with excellent GPA level.

Recommendations

In the light of the study results, the researchers recommend the following:

- 1- Assigning the supervision and follow-up of the field-training students, specialized in special education, to efficient, highly experienced teachers, with at least 5 year-experience.
- 2- Holding training courses and semester meetings for the collaborator teachers to develop their abilities, improve their viewpoints on training, and deepen their feeling of responsibility, to be actual supervisors, capable to direct the trainee students.

Conducting other studies aiming at identifying the factuality of the challenges that face collaborator teachers, and impede providing the optimal supervision and training.

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Reflections from a Teachers' Perspective about the Challenges Faced by Students with Disabilities Majoring in Japanese as a Foreign Language

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Abstract

Learning to read and write the Japanese language is not an easy task. For the non-Japanese speaker this can be a struggle and a challenge. Some schools in Western Australia offer children the opportunity to learn Japanese as a foreign language. Consequently, Japanese as a foreign language unit is offered to all undergraduate students in Education. All undergraduate students face challenges in mastering Japanese as a foreign language because of the stringent requirements of the language. It appears that the recognition and writing of Kanji (logogram) is one of the most challenging learning task for the learners.

This paper is a reflective study based on the teacher's perspective about University students' challenges and problems in relation to writing and recognising Kanji.

In this study, the teacher reflected on three questions:

- (1) The identification of the challenges and problems that university students with disabilities face in writing and recognising the Kanji script;*
- 2) What are the adaptations that need to be considered in the delivery of the program while retaining the integrity of the unit?*
- (3) What changes should be made in the assessment requirements to include the learning needs of students with disabilities?*

Keywords: *Disability, Kanji Script, Japanese, teachers' perspective*

Introduction

All educational institutions provide various levels of counselling, support and other disability services, for any student who may be experiencing learning difficulties. It is not uncommon for undergraduate students to request additional learning support from the institution's counselling and disability services department. The requests vary from assessment requirements to course enrolment. More often, the changes are addressed by the lecturer and the undergraduate student concerned to meet the needs of the student. A method that is similar to the Individual Educational plan (IEP, Foreman & Arthur-Kelly, 2014). Reasonable adjustments can be made to meet the needs of the undergraduate students with special needs. This strategy of adapting the classroom programme, and in this case the undergraduate degree programme, to meet the needs of the learners has been addressed in other research (Mitchell, 2014). Mitchell (2014) suggested that for inclusive classrooms to be successful the following components need to be present and these included: Vision + Placement + 5 A's (Adapted curriculum, Adapted Assessment, Adapted teaching, Acceptance and Access) + Support + Resources + Leadership. Of interest to this study is the Adapted Curriculum and Adapted Assessment which Mitchell (2014) suggested should be flexible, relevant and adjustable to meet the needs of the learners. Educators are expected to pitch their content to the needs of the individuals in a growing diverse classroom. Such diversity in classrooms would mean that Educators would have to consider the different rates of learning and therefore adaptations become necessary (Mitchell, 2014).

The Disability Standards for Education, Australia (2005) were developed based on the Disability Discrimination Act 1992 and for which it clearly explains that the education provider is able to make any decisions in relation to the admission, enrolment and or participation for students with disabilities. This is done through what is called 'reasonable adjustments' (Disability Standards for Education, Australia, 2005).

Mitchell (2014) suggested that educators could enhance the accessibility of learners to curriculum by making modifications, substitution, omission and compensation to the curriculum. For example, making modification by expecting responses using computers or I-pads rather than oral responses from learners. An educator could expect braille for written materials for the student with visual impairment, omitting very complex work and allow for practical and functional activity in place of the written work (Mitchell, 2014).

Similarly, Tomlinson (2014), stressed the importance of differentiating classroom teaching based on the diversity of students and their differing needs. The author rationalises that in differentiating classroom content educators would give access to learning, motivate and engage learners. In addition, it would make the learning experiences relevant as the content takes the students interests, readiness and learning profile into consideration (Tomlinson, 2014). The consideration of the learning profile that Tomlinson (2014) writes about is similar to the IEPs that the field of Special Education Specialist would use when planning for learning activities in a classroom (Foreman & Arthur-Kelly, 2015; Hyde, Carpenter & Conway, 2016) Further, Tomlinson (2014) suggested that differentiation would also affect the efficiency of learning and challenge the individual at the appropriate level. An idea that was also suggested by Mitchell (2014).

Language acquisition and foreign language learning

Literacy and oral skills make up the fundamental macro skills in understanding Japanese as a foreign language. The four macro-skills of listening, speaking, reading and writing form the basis and are the core of modern language learning (Akram & Malik, 2010). Listening (L) and Speaking (S) are categorised as oral skills, and Reading (R) and Writing (W) as literacy skills. The research suggests that oral language serves as the foundation to the development of literary skills (Bayetto, n. d.). In addition that in language acquisition, literacy skills will require more time to master compared with oral language development (Hill, 2011). The literature suggests that to support and enhance the learning in the target language, class activities should focus on the students' understanding and mastering these skills with no isolation of each other but via integrated approaches leads to the effective enhancement in the other skills. This may eventually result in the improvement of the one's target language performance in general (Oxford, 1996), while the language teachers tend to concentrate on particular skill (Akram & Malik, 2010). Learning Japanese as a foreign language is no exception and improvement of one's proficiency in Japanese as a foreign language would require the mastery of the four macro skills (see Table 1).

Table 1. Four Macro skills

	Receptive skills (Passive/Input skills)	Productive skills (Active/Output skills)
Oral skills	Listening (L)	Speaking (S)
Literacy skills	Reading (R)	Writing (W)

The communication style is served by the foundation of the receptive skills, aka passive/input skills (L & R) and productive skills, aka active/output skills (S & W). The former (L & R) are perceived as the necessary skills for people to communicate with each other during any type of interactions occurring daily. In a foreign language class in which communicative teaching is the major influence, conversations as in the oral skills, in the foreign language tends to have a larger focus leaving the literacy skills at risk. Consequently, the literacy skills are often overlooked and under taught (Ayadogan & Aydogan, 2014). In other words, aiming at creating students with conversation and verbal performance in the target language may run the risk of producing students who do not have the literate skills of reading and writing (Ayadogan & Ayadogan, 2014). Given that both Oral and Literacy Skills (Receptive and Productive Skills) are linked, then one would expect that reading and writing be included in any foreign language education programme. Further, since writing can be categorised as part of the literacy receptive and productive skills, time and effort to master writing and in this case the 'kanji' script could be a difficult task for students.

In learning the Japanese language, one has to understand that unlike the Latin alphabet, the written scripts are based on three characters called Hiragana, Katakana, and Kanji. There is a total 46 basic Hiragana syllabaries (aka Kana in Japanese), representing sounds and utilised for the creation of any words. Katakana words are also expressed by the phonetics of the Japanese syllabaries, primarily of non-Japanese origin words. Hiragana and Katakana contain phonograms which is most students do not find difficult to comprehend.

However, Kanji which has its origins from the Chinese characters, is one of the major learning tasks in Japanese due to its logographic nature. This difficulty is faced by both native and non-native learners of the Japanese language. The total number of existing Kanji can be found in the Dai Kanwa Jiten, the largest Kanji dictionary (Morohashi, 2000). The Dai Kanwa Jiten has approximately 50,000 Kanji characters. However, the Agency of Cultural Affairs, Government of Japan (2010) lists 2136 of the Kanji characters for common use in the current society of Japan. These 2136 Kanji characters are to be learned through the nine years of compulsory school years. It is generally considered that individuals with an additional 1000 to 1500 Kanji knowledge could help with reading information in various written articles such as the newspapers and advertisements in daily life (Gottlieb, 2000).

However, the concerns about Kanji characters goes beyond the particular number of scripts to be mastered, rather, each Kanji character represents a meaning and its' interpretation depends on the multiple ways in which it can be read. For example, the Kanji character could be read by multiple quasi-Chinese pronunciations based on the original Chinese sound (referred to as *on* reading), as well as native Japanese translations indicating the meaning of characters (*kun* reading, Sugimoto, 2009).

A logogram system such as Kanji can be fostered through both receptive and productive skills. From the perspective of receptive skills, the learners' knowledge of Kanji can be obtained through reading and it can be assessed through human contact (such as teacher-developed instruments and feedback) as well as various media and technological devices. However, in the productive skill, assessing one's skill in writing Kanji characters cannot be demonstrated in the same way as receptive skills. There are two concerns. The first relates to Kanji typing which is primarily supported by computer devices which use phonemic orthography. The conventional practice for students learning Japanese as a foreign language is that they are allowed to type Hiragana/Katakana syllabaries, which is produced by the Roman alphabets. From here, the computer converts them to possibly multiple Kanji characters. The students then select the Kanji character that best fits their meaning in relation to their context. However, this process does not help students to practice the skill of writing the Kanji script and only caters to recognising the script. The second concern relates to the differences between typed syllabaries on a keyboard compared with hand written Kanji. Given that the Kanji script (logogram) contains more strokes than Hiragana/Katakana (phonograms), when students hand-draw with a pen or pencil, there is a greater risk of it becoming dissimilar or non-identical to the appropriate and/or acceptable written Kanji characters. In addition, the availability of multiple fonts on various computer programmes may enhance the differences when compared with the written form of the Kanji script.

It has become apparent to the researcher that students have a variety of challenges that arise as a consequence of the requirements of the understanding and learning Japanese as a foreign language. Japanese language is a non-Latin script language, containing Hiragana, Katakana and Kanji, and recognising, pronouncing and writing the Kanji character (logogram) requires learners to spend a large amount of time to master. Prior to that, learners with non-logographic language background need to acknowledge and are familiar with the concept of the logographic characters such as Kanji. Among the four macro skills, productive literacy skill which is writing expects learners to focus on their accuracy. Therefore, Kanji naturally forms one of the most integral part

of the learning process in Japanese. Anecdotal observations in classroom teaching suggests that undergraduate students will need more time to the skill of script writing the Kanji character. The problem arises when the undergraduate student is unable to write or type and will eventually fail to meet the full range of the literacy and the key productive skill as highlighted in this paper (see Table 1).

This paper is a reflective study from the teacher's perspective, of undergraduate student's challenges and problems in relation to writing and recognising Kanji characters. The first aim is to identify the challenges and problems that university students with disabilities encounter in writing Kanji. The reflection is guided by the questions which include firstly, the challenges faced by students with disabilities in relation learning the content requirements of Japanese as a foreign language. Secondly, the teacher reviews the adaptations that should be taken into consideration in the delivery of the programme while retaining the integrity of the subject. Lastly, from the reflections of the two questions, the research aims to review the current practice in the unit to assist undergraduate students with disabilities in undertaking the unit Japanese as a foreign language. Currently, there is a lack in university's understanding of such challenges students' with disabilities face in writing the Kanji character. This study hopes to fill this gap of knowledge in the field of learning Japanese as a foreign language.

Method

This study was based on the reflections of a university lecturer (teacher) with 23 years of experience of teaching and assessing undergraduate students in Japanese as a foreign language. Using a qualitative approach, a framework of specific questions was used to guide the reflection of experiences in teaching and assessing undergraduate students in the unit (Colomer, Pallisera, Fullana, Burriel & Fernandez, 2013).

The framework of the reflective questions included:

1. What are the challenges faced by students with disabilities in relation to the content requirements of Japanese as a foreign language?
2. What are the adaptations that should be taken into consideration in the delivery of the subject while retaining its integrity?
3. What changes are needed in the assessment requirements to address the learning needs of students with disabilities for the unit of Japanese as a foreign language?

The reflective process

The reflective process as a whole examined multiple emails, discussions with students with disabilities in class and meetings with students sometimes with their parents by the first author.

The Reflections and Discussion

1. What are the challenges faced by students with disabilities in relation to the content requirements of Japanese as a foreign language?

The physical requirement of writing “kanji”. It is anticipated that students who are unable to hand-write will not be able to fulfil the subject requirements and/or apply their skills in a classroom when teaching Japanese as a foreign language. The tertiary qualification awarded to students of Japanese as a foreign language is based on the students gaining specific skills and in this case the importance of writing the Kanji script. Students’ academic marks cannot be allocated fairly if they are unable to produce and provide evidence of their writing skill. The biggest challenge that students with a disability faced in studying Japanese as a foreign language is writing the Kanji Script. Kanji hand-writing plays an integral part, and many students need to spend an extremely large amount of time improving their knowledge (receptive skill) and writing (productive skill) of Kanji in order to have a broad understanding of the overall Japanese ability including Listening, Speaking and Reading. The authors recommend that students’ participation and record of the number of hours spent by the students to master writing the Kanji script in future studies.

In adapting the curriculum to the needs of the learners with disabilities (Hyde et al., 2016; Mitchell, 2014), the adjustment made in the unit to assist the individual would be to remove the requirement of writing the ‘kanji’ character script. The authors suggest that based on the reflection that students with disabilities have difficulty with writing the “kanji” script, this would be a reasonable requirement for the unit. However, it is also suggested that prior to enrolment of students, that this information is made transparent to all students with a clear understanding that while they could embark on the full requirements of the unit course, they would not be assessed on the requirement of the writing the “kanji” character. It is understood that the difficulty and inability to write the script of Kanji will limit the learning of Japanese as a foreign language as it forms the core area in the language. An alternative and depending on the degree of the disability, Mitchell (2014) suggested that other than omitting complex work, consideration could also be given to modify and substitute expectations in the programme. Using Mitchell’s (2014) suggestions, the researchers in this study suggest that while the writing of kanji is removed from the assessment, perhaps, and extension of the Listening, Speaking and Reading areas could be used as part of the assessment.

However, a major challenge arises from the recommended adjustment in omitting the requirement of writing “kanji” character from the unit requirement. The implication of an undergraduate teacher not being able to write ‘kanji’ would mean that they would have limited employment prospects in the schools. In the school system, Japanese as a second language for the ATAR (Australian Tertiary Admission Rank) course in 2016 has listed a total of 188 Kanji, including 86 productive ones (aka writing Kanji) and receptive (for one to read and comprehend) 102 Kanji in the Year 12 syllabus (Government of Western Australia, School Authority, 2016). In response to this requirement in the schools, the Japanese Language was introduced as part of a degree course at tertiary education level. The expectation is that university students are expected to allocate three to four years study in Japanese and to master the language thus knowledge of writing beyond 188 Kanji characters.

Writing Kanji takes a large portion of the time spent for learning Japanese learning and irreplaceable by other Information, Communication Technology supportive materials. The authors suggest that while this is a bold step in teaching Japanese in schools and if and when schools choose to employ and include individuals with disabilities to teach students in Japanese as a foreign language, they would have to review how to accommodate for these changes so that students in the school will be able to meet the curriculum requirements. The authors in this study suggest that the local school could allocate the task of writing Kanji to a part-time staff thus enhancing the employment opportunity for the individual with a disability in a school. The findings of this study suggest that a further investigation into understanding the perceptions and understanding of anticipated challenges of school leaders and teachers toward employment of teachers with a disability in Japanese as a foreign language.

2. What are the adaptations that should be taken into consideration in the delivery of the programme while retaining the integrity of the subject?

The challenges described above have brought about practical implications, which are motivated by theoretical insights. The following set of three factors have been proposed for assisting students with learning Japanese as a foreign language.

Analysing the student's challenge as temporary or permanent. The collaborative team working with the student with the disability plays a vital role to ensure the smooth start and end in any course and unit and this would involve the student and the parents. Determining the nature of the challenge as to a long term (permanent) or short term (temporary) problem could be identified and plans could be made to assist the student. It is anticipated that a student with a disability will have a case profile that could help understand the abilities of the student while also giving details about the individual's difficulties in learning and or physical challenges. Using this information and in consultation with the student and the parent, a unit plan for Japanese as a foreign language could be developed to meet the needs of the student concerned. It is noted that the plan is a working document and will need reviewing from time to time to meet the changing needs of the student. Adjustments and adaptations could continue based on the growing needs of the individual over the duration of their degree programme. This would mean that if and when a programme has proved to be working for the individual student, it could be enhanced. At this point the authors would stress that the lecturer has a large contribution as to the how this individual programme could be developed for the student.

Assessing the student's four-macro skills and the type of unit assessment tasks. In mastering the Japanese as a foreign language, it has been recommended that the four -macro skills, in parallel with micro-skills should be assessed. The assessment requirements will need to include these skills. It would be important to understand whether students have challenges in learning these skills and if so what these challenges are needs to be clearly identified. From here, the support team will need to work with the students to identify suitable strategies to assist the student with the challenges to assist with the completion of the assigned tasks. This could be suitable assistive devices and/or modifying the expected responses of the students to cater for their individual needs (Mitchell, 2014).

Understanding the student's purpose of study in Japanese as a foreign language. Despite some variations in personal motivations, obtaining a certificate/degree successfully is a common goal for all students to undertake specific higher education courses. If a student has a specific difficulty that might preclude him or her, the support team must investigate further the student's aim in taking higher education certificate and or degree with Japanese as a foreign language. It is necessary to consider which macro-skills are in demand, if the student's future desired profession can only be attained with the certificate/degree of Japanese as a foreign language. For example, an occupation such as a secretary using Japanese language would require the student to be fluent in all macro-skills in Japanese for oral and literacy purposes. However, a translator would need to focus more on his/her literacy skills (Reading and Writing). On the other hand, one would anticipate that a tour guide may only prefer to have an understanding of conversational Japanese and may not require the depth of the literacy skills as in Reading and Writing. A simultaneous interpreter, however, required to interpret from Japanese to another language or vice-versa at an official press conference, needs all four macro-skills, along with extra professional techniques including shorthand writing.

3. What are the changes needed in the assessment requirements to include the learning needs of students with disabilities to certify their Japanese as a foreign language completed at higher education?

Clarification of the students' eligibility in mastering Japanese as a foreign language. In order to accept as many students as possible, modifying the assessment requirements to include the individual with a disability is a challenge. One would recommend continued conversations to solve this dilemma of meeting the minimum requirements in mastering Japanese as a foreign language, school requirements and enhancing the inclusion of individuals with disabilities in enrolling in such a unit at any tertiary institution.

The importance of the unit content in Japanese as a foreign language. The realisation is that until local school systems change to accommodate for the changes that are made at the University level, the content requirements cannot change to include the individual with a disability in such a unit. However, if this is not the aim of the undergraduate student (i.e. to teach Japanese as a foreign language in a school or other educational setting) then changes to meet the needs of the individual as in excluding the script "kanji" for example, could be a possible learning outcome for the student. This must be made clear to the student prior to commencement of the unit.

Omission of the written Assessment (kanji script).

The Disability Standards for Education, Australia (2005), advocates that an education provider could make 'reasonable adjustments' to meet the needs of students with disabilities, a consideration that was taken in this paper. Consideration was given to omit the written assessment and to only include the other assessments with a recalculation of all other assessments up to a 100 percent. This may, however, not be a preferable option for the students with disabilities and further investigation in another study is warranted.

Conclusion

This paper has identified the challenges and problems that university students with disabilities encounter in learning the Japanese Kanji script in Japanese as a foreign language through the reflections of a professional with more than 23 years of teaching students in the subject area. The information obtained from the reflections can be used to help create an awareness of the problems experienced by students with disabilities undertaking Japanese courses in higher educational institutions, especially those facing obstacles in writing Kanji scripts. Specific modifications to course design and or delivery have been recommended here, in order to meet individual student needs. Furthermore, the reflection helps to inform the current body of knowledge relating to writing Kanji script, especially about the necessity to consider students with disabilities who wish to study Japanese as a foreign language and equip themselves with alternative strategies based on their individual needs.

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Perceptions of Using Assistive Technology for Students with Disabilities in the Classroom

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Abstract

In special education, professionals interact with families and individuals with special needs who seek support. One part of the support that professionals and educational agencies can provide is assistive technology. This study was conducted to determine education professionals' opinions regarding the use of assistive technology in the classroom. There is a significant connection between what people think and what they practice regarding assistive technology. Educators should acknowledge this relationship and how it may shape the entire educational experience of students with disabilities. In this particular study, the researcher intended to reveal the factors behind the lack of availability of assistive technology in the classroom, as well as to determine peoples' attitudes towards supporting individuals with disabilities and their right to access the general education curriculum in the classroom. Twenty-eight students and staff members from a Midwestern University in the United States participated in the study; generally, participants were asked if they support the use of assistive technology or not, and to pinpoint obstacles that might prevent people from using assistive technology.

Keywords: Assistive technology, disability, general classroom, students with disabilities. Students' attitude.

Introduction

Recently, assistive technology and its importance has been a controversial aspect associated with special education because of people's attitude towards the use of assistive technology. People may look at assistive technology as a tool that leads students with disabilities to succeed, while others believe assistive technology makes them dependent and students with disabilities will not be able to do the tasks on their own (Edyburn, 2006). A great deal of research has been conducted to measure the significance of using assistive technology in the classroom and how it can be integrated into the general curriculum and used for assessment. Individuals with disabilities sometimes have difficulty with tasks, leading to others making decisions for them (Carlson, Ehrlich, Berland, & Bailey, 2001). The complexity of tasks may interfere in their daily lives and education as well. People with disabilities have the right to practice their life in the way they choose; however, if they are incapable of this and are prevented from accessing assistive technology, it can lead to a dependency on others. In the case of students with disabilities in the classroom, assistive technology has the potential to enhance and increase their learning and academic performance (Edyburn, 2006). Currently, many students with disabilities are included in the classroom. Students may have difficulties in different areas like reading, listening, organizing information, or writing. An inclusive classroom may help them to overcome some of their challenges, yet it may also create other problems if they are unable to access the general education curriculum. Some professionals support using assistive technology in the classroom while others have different perspectives of using assistive technology (Edyburn, 2006). Assistive technology is a broad concept that includes a range of services and devices. Assistive technology devices are identified in the Individuals with Disabilities Education Act (IDEA) 2004 as: "Any item, piece of equipment or product system, whether acquired commercially off the shelf, modified, or customized, that is used to increase, maintain, or improve the functional capabilities of children with disabilities". As defined in IDEA, an assistive technology service is any service that directly assists a child with a disability in the selection, acquisition, and use of an assistive technology device (IDEA, 2004). Assistive technology devices can be divided into two categories; high tech and low tech. High-tech devices are more complicated and cost more. They also require training or guidance from the user, such as adaptive equipment, voice recognition software, or word prediction software (Johnston & Watson, 2007). In contrast, low-tech is low-priced equipment, as it costs less than high-tech, it is simply designed, and requires limited training. Examples of low-tech devices include but are not limited to talking watches, pencil grips, highlighting marker tape, eyeglasses, and ear plugs to reduce distraction (Johnston et al., 2007). Assistive technology is intended to help and assist people who have challenges or disabilities. As a special educator, the researcher is concerned with the well-being of students, especially those who have disabilities. Students with disabilities need to have an accessible educational environment allowing them to participate in the classroom. The Least Restrictive Environment (LRE) is one of the significant elements that should be provided for individuals with special needs (Turnbull et al., 2001) as required by the IDEA. In order to promote the classroom acceptance of students with disabilities, there are many techniques that have to be considered, one of which is assistive technology. The classroom is one place that children with disabilities, regardless of the nature of the disabilities, spend most of their time; thus, it should prepare them academically by providing them with content knowledge and social interaction with their peers. Assistive technology can help create the accessible environment that children with disabilities, parents, and special educators are looking for. Students with disabilities can be as successful as their peers when the educational system

provides the necessary accommodations (Edyburn, 2004). For example, if schools adapt the general curriculum using assistive technology, whether it is hardware or software, students with disabilities are given the opportunity to participate in the general education curriculum. Educators frequently seek new strategies to help their students understand the context of the subject being taught. Assistive technology can aid students with disabilities in overcoming or bypassing their learning challenges. When educators acknowledge not just the disability, but also the ability that students with special needs have to benefit from assistive technology, they would support providing it in the classroom. Even though education professionals understand the importance of assistive technology, it is unknown what the general public understands about assistive technology. In order to learn more about the general public's understanding of assistive technology, the researcher conducted a pilot study to determine the general public's opinions regarding the importance of using assistive technology in the classroom. The study investigated the most common types of technology people used, opinions regarding the rights of students with disabilities to use assistive technology in their daily and academic life, and also what kind of difficulties might prevent students with disabilities from having access to assistive technology.

Review of the Literature

The following literature was reviewed to gather the professional perspectives from educational research regarding the use of assistive technology in the classroom, and to gauge how students with disabilities can benefit from using assistive technology in the classroom. Law and Assistive Technology.

Assistive Technology Laws

The special education laws have passed through multiple stages, beginning with a focus on preventing the segregation of people with special needs, to a focus on laws that require people with disabilities to be included in public education. Since special educators are an essential aspect in the Individual Educational Program (IEP) planning, it is necessary for them be aware of the laws associated with the use of assistive technology. The following sections will review the most important laws that have been created regarding the rights and use of assistive technology.

Ordovery (1994) outlined forty assistive technology rights under the Individuals with Disabilities Education Act (IDEA). In IDEA Part B, children and youth ages 3 through 21 attending the state school system and other public agencies that educate students with disabilities must be provided with assistive technology devices and services. Education agencies must ensure that students with disabilities are offered the free, appropriate public education to which IDEA entitles them (Judge, 2000).

Russell, Hendershot, Leclerc, and Howie (1997) stated that people with disabilities have a lawful right to be accommodated in public places and the workforce because of the passage of the Americans with Disabilities Act (ADA). The authors point out that accommodation consists of providing assistive technology that includes devices or adjusting the existing surroundings to best serve people with special needs.

Russell et al., (1997) reported that in The Technology-Related Assistance for Individuals with Disabilities Act of 1988, the federal-state agencies intended to establish programs to notify

and educate people with disabilities and those who serve them regarding the availability of assistive technology devices and their use.

Judge (2000) found that the law requires local schools to provide assistive technology for students with disabilities; which allows students with special needs to receive an education in the least restrictive environment. He demonstrated that the need for assistive technology, whether services or devices, has to be addressed in the IEP. When the IEP team decides that a student needs assistive technology, the school system has to find funding to acquire the device for the child. Merbler, Hadadian, and Ulman (1999) also reported that The Technology-Related Assistance for Individuals with Disabilities Act of 1988 makes AT equipment accessible to students with disabilities in the grant program. Equal access to AT for students allows students with disabilities access to competitive employment and training that general education peers complete; accordingly, AT must be provided at the school's expense.

Benefits of the Use of Assistive Technology

Aiken and Whitney (2009) studied the use of technology in the curriculum. In their study, students in the School of Business rated their comfort with using technology in the classroom and also using a specific software program in their studies during their academic life and beyond. The study examined participants' level of comfort in using technology in the classroom through the use of software in the classroom. The programs used were the Comfort Scale (CCS) and an Excel-based assessment to determine computer proficiency. The results indicated that students used the software successfully, and it helped them to participate in the School of Business and understand the statistical programs without difficulty.

Assistive technology in the classroom is one of the most important accommodations that educational agencies have to provide; moreover, teachers should be aware of their students' needs (Watson & Johnston, 2007). Additionally, Watson and Johnston report that high-tech computers and software can be helpful tools for students with mild disabilities such as dyscalculia, dyslexia, or dysgraphia. One of teachers' major responsibilities is to provide children, regardless of their disabilities, with successful learning experiences and assistive technology can help teachers to reach this goal giving their students an opportunity for a brilliant future (Netherton & Deal, 2007). However, accessibility to assistive technology devices is still difficult for financial reasons and prevents some students with disabilities from having access to them in the classroom (Watson & Johnston, 2007).

In schools, millions of students with learning disabilities are not able to access the technology and information available, while in the same school the rest of the students can access the information they need with the click of a mouse (Bausch & Hasselbring, 2006). Through the use of assistive technology and digital technologies, students with learning disabilities are able to gain the same benefits as their peers in the classroom (Bausch & Hasselbring, 2006). Additionally, using software and assistive technology in the home, students with learning disabilities can learn alongside their typically developing peers in the classroom (Bausch & Hasselbring).

Typically, students with physical disabilities face difficulties that prevent them from accessing and participating in regular education programs. However, assistive technology allows

them to be included in the regular classroom (Behrmann, 1994). Assistive technologies also provide students with disabilities opportunities for learning independence. There is a great deal of software and assistive technology that can open a bright future for students with disabilities (Hopkins, 2006).

Assistive technology can help students with physical disabilities tremendously; similarly, Bateni and Maki (2005) found that assistive technology also has many clinical benefits, such as improving people's mobility and their ability to complete daily tasks through the use of canes and walkers. Mobility aids can increase people's self-confidence and feelings of safety, which helps them to achieve the highest level of independence in their lives.

Bryant (1998) demonstrated that teachers used cooperative learning in the classroom to promote academic achievement and social acceptance of students with and without learning disabilities. Cooperative learning is of interest to classroom teachers because it can provide an opportunity for more instruction and feedback by classmates than that which is provided by teachers to individual students who require additional assistance. Bryant stated that students with learning disabilities may need assistive technology allowing them to engage and interact with their typically developing peers during cooperative learning activities in the classroom. Barriers to the Use of Assistive Technology.

Barriers to the Use of Assistive Technology

Some assistive technology services and devices may require a great deal of effort in order for students to access and properly use them. The barriers of accessing assistive technology may include but are not limited to funding, training, and insufficient assessment. The literature below describes some of the obstacles that might prevent individuals from accessing assistive technology.

Judge (2000), stated that financing for assistive technology has been a major barrier to acquire assistive technology (AT) devices and services. He claimed that different public and private sources offer funding to individuals with disabilities in order to obtain assistive technology they need; however, obtaining assistive technology can still be difficult for families due to the cost. Copley and Ziviani (2004) reviewed the literature to identify and recognize the major obstacles in assistive technology assessment and implementation for children with multiple disabilities. The authors listed several barriers including a lack of appropriate teacher preparation and support, negative staff attitudes, insufficient assessment and planning processes, insufficient financial support, difficulty obtaining and managing equipment, and time constraints. The authors stated that with the use of AT, some deficit areas can be improved such as handwriting, motor skills, reading, and math skills.

Edyburn (2004) indicates there is little proof that preservice teachers receive sufficient training in the use of assistive technology to prepare them for their responsibilities to evaluate the need for, and even consider assistive technology in Individualized Educational Program (IEP) meetings. Likewise, in-service teachers have obtained inadequate preparation. Edyburn found that the majority of the members of the IEP team had little preparation in assistive technology or no training whatsoever. Similarly, Judge (2000) stated that in some special education teacher preparation programs, most of the time the course in assistive technology is

not obligatory; consequently, preservice teachers do not get the preparation they need regarding assistive technology.

Regarding the impact of using assistive technology on students' academic performance, Edyburn (2006) said when students with mild disabilities cannot accomplish their academic tasks, teachers must find a strategy to help them. Professionals should understand that at some point, technological tools can be helpful, and assistive technology can help students with disabilities to complete their tasks successfully and independently. Owens, Leung, Lamb, Smith, Shaw, and Hauff (1999) demonstrated issues related to assistive technology. They investigated the effectiveness of assistive technology for students with disabilities and university staff who work with them in an Australian university. The aim of the study was to explore the barriers of using assistive technology in the Australian university. Participants, 88 university students, were asked to complete a questionnaire developed by the project team. The questionnaire was designed to gather specific information regarding the use of assistive technology. The participants were asked about the costs and funding for AT. Participants reported that the cost of most AT ranged from \$10 to more than \$2000, which in many cases, prevented them from accessing AT devices and services. Several students received funding for AT, while the remaining had no funding and/or had difficulty knowing about funding sources and how to access them.

The literature reviewed in this study supports the use of assistive technology in the classroom for students with disabilities. Moreover, it demonstrates that using assistive technology has many advantages in the classroom such as a positive impact on performance for students with disabilities, leading to greater independence and improved quality of life for individuals with disabilities. In this study, the researcher intended to determine if the general public understood and supported previous studies regarding the use of assistive technology. The following section describes the methods used to obtain people's understanding of and perceptions toward the use of assistive technology.

Method

Participants

The participants in this study responded to an online survey that was designed using the Google website. The link was published in an electronic newsletter distributed weekly to all members (faculty, staff and students) of the College of Education at Midwestern University in United States. The participants were asked to complete the survey by clicking on the link, filling out the survey, and anonymously submitting it. After the surveys were submitted, the researcher received a spreadsheet that included all the responses through the Google website. There were no limitations on participation; anyone receiving the newsletter could participate in the study.

Survey Instrument

The data collection instrument used for this study was a survey that included ten open-ended questions that were required to be answered in order to submit the survey. The questionnaire was designed to investigate people's perceptions and attitudes regarding the use of assistive technology for students with disabilities in the classroom. The survey included ten questions addressing the use of assistive technology, the fairness to other students, the

relationship between socio-economic status and access to AT, and the availability of AT in the classroom.

Procedure

Three months prior to conducting the research, a pilot study was designed, which was described earlier. It took two months to create the pilot study. The instrument was an online survey that was designed through the Google website and a link was posted on Facebook for participants to respond to.

The survey in this research was a modification of the questionnaire that was used in the pilot study. The pilot study was conducted after official approval was granted by the University's Office of Research Compliance. The questionnaire in the pilot study was modified and sent to the Ohio University Office of Research Compliance to approve the changes. After approval was received, a link to the new survey was published in the electronic newsletter distributed by the University's College of Education, along with an invitation to participate. There was no obligation for participation in the survey and the data was collected anonymously. A statement of agreement/consent was posted with the link that informed participants that they had to be over 18-years-old in order to complete the survey. The statement of agreement also clarified that the participant had the option to exit the survey without any repercussions or penalties. By clicking on the link, the participant simultaneously consented to participation. The link was open for three weeks during April of 2010 and the participants could access the link at any time.

Results

The following section describes the results of 28 responses to an online survey that was designed to gather people's perceptions regarding the use of assistive technology in the classroom for students with disabilities. Assistive technology in this study was defined according to the Assistive Technology Act of 1998 as "products, devices or equipment, whether acquired commercially, modified or customized, that are used to maintain, increase or improve the functional capabilities of individuals with disabilities"

The data in table shows that 92% of the participants did not report having any kind of disabilities, with the remaining 7% of the participants having a disability. In regards to individuals' experiences with using assistive technology during their education, 78.6% state that they have not utilized assistive technology whether devices or services, but in contrast, 21.4% have used such technology.

Use of AT. Seventy-five percent of the participants reported having been allowed to use assistive technology in the classroom, while 25% of them have not. Regarding the positive impact of using assistive technology on the academic performance of students with disabilities, 96% believe (AT) makes a significant difference in students' performance, yet 3% of the participants disagree. The participants who agree on the positive impact of (AT) explained that AT can help students perform tasks that they struggle with. Moreover, the (AT) is one of the strategies that educators must consider to help children better overcome their challenges.

AT and fairness. The data in table demonstrates that 85% of the participants disagreed with the following statement: “When students with disabilities are allowed to use assistive technology, it is unfair to others.” Participants reported that the term “fair” means students should obtain what they need in the classroom to help them improve academically, and AT gives them the opportunity to acquire the assistance they need. On the other hand, 14% of the participants agreed that AT for students with disabilities is unfair to others and they state that using AT depends on the situation, as well as on the kind and degree of the disability.

Funding for AT. The majority of the participants disagreed with the statement that “All students with disabilities regardless of their social economic status have an opportunity to get the assistive technology they need” and they clarified that funding and cost are the major barriers that may prevent students with disabilities from gaining access to AT.

Teachers’ knowledge of AT. Regarding teachers’ awareness of the benefits of using assistive technology, 89% of respondents believe teachers are not completely aware of the benefits, yet 10% believed that teachers acknowledge the importance of assistive technology. The greater percentage of the participants agreed that schools should provide assistive technology to students with disabilities because educational agencies are responsible for educating students and funding them. However, as seen in figure 3, 10% believe that schools are not obligated to provide assistive technology and no explanation was reported regarding that belief. Availability. In response to the following statement: “The availability of assistive technology in the classroom gives students with disabilities opportunity to access to the general curriculum,” 92% agreed with emphasizing the necessity of training students with disabilities on how to use AT, whereas 7% disagreed with the previous statement due to the difficulties that students with such issues might face in the general curriculum. Advantages and disadvantages. The participants listed many advantages regarding the use of assistive technology in the classroom. For example, a number of the individuals said that assistive technology can help in terms of having inclusive classroom for all students, regardless of their disabilities. Participants reported that AT might help students in some ways to achieve their academic tasks and AT allows students with disabilities to be independent and participate in the curriculum. However, respondents also state that AT might have some disadvantages, such as labeling students with disabilities negatively, which can also cause emotional harm. The following figures provide a visual representation of additional survey results.

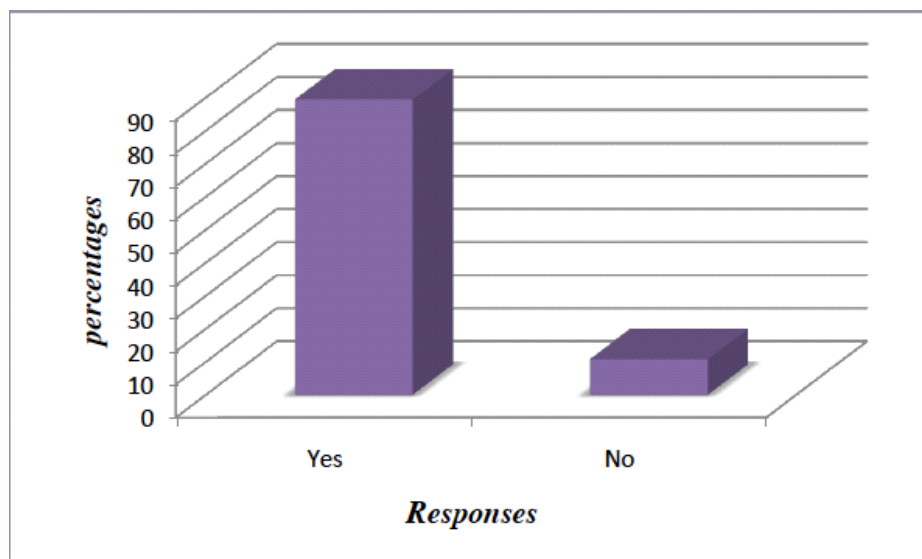


Figure 1. Impact of AT on Academic Performance of Students with Disabilities

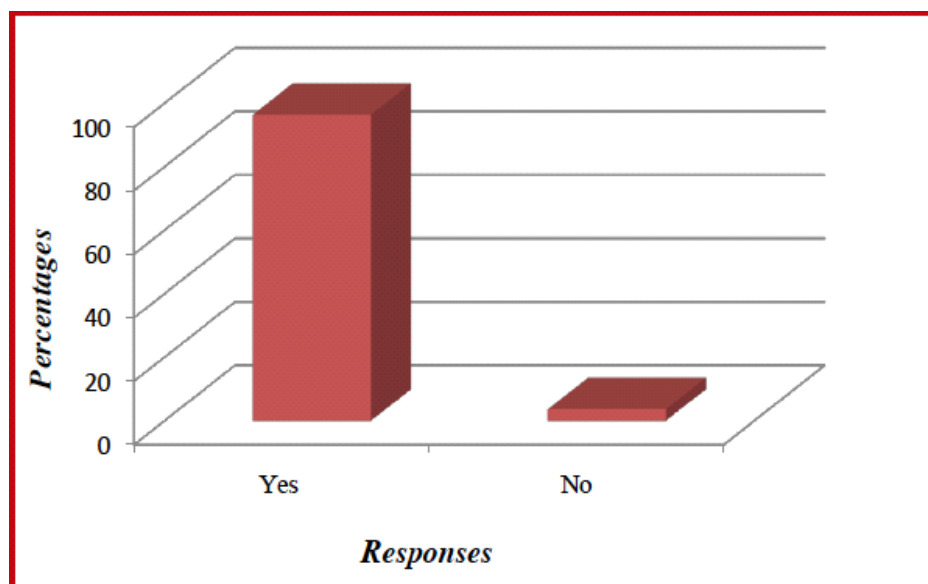


Figure 2. Perceived Relationship Between Socio-Economic Status and Access to AT

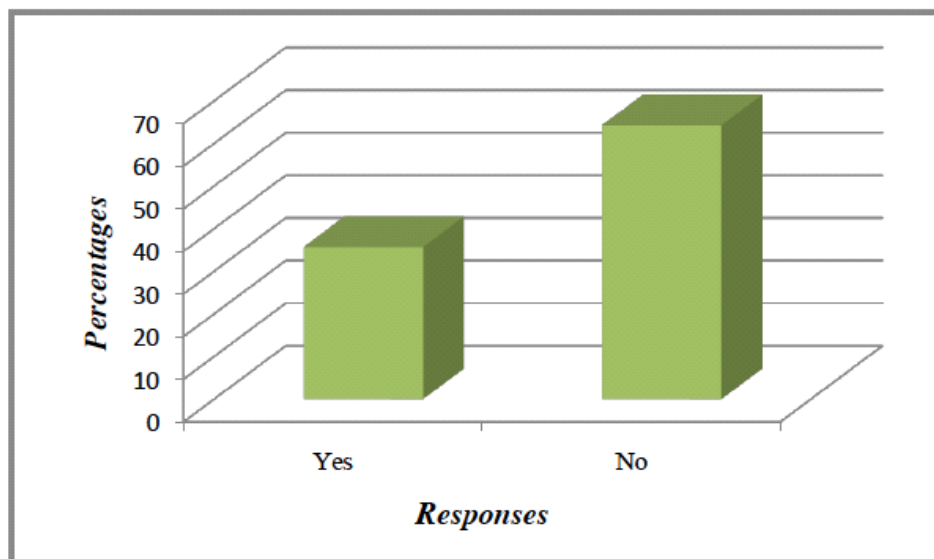


Figure 3 . Provision of AT in the Classroom: Should it be provided?

Conclusions/Recommendations

Assistive technology can be a useful and supportive tool for students with disabilities. It helps both teachers and students create an unforgettable learning experience. The researcher strongly believes that every individual can learn and improve themselves academically, yet individuals must have access to the learning environment in order to achieve these goals. Teachers, parents, families, and the community can work collaboratively to provide a successful learning environment. In modern societies, technology has become a crucial part of life and social advancement. It is part of the educators' role to provide assistive technology to people with disabilities and to allow them to benefit from and improve their quality of life through the use of the best technological assistance available.

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Meta-Analysis of Disability Simulation Research for Elementary Students in Korea

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Abstract

Disability simulation is an educational approach to modify attitudes and behaviors toward persons with disabilities by allowing participants to experience simulated life activities of individuals with disabilities. Despite the controversy regarding the effectiveness of disability simulations and its potential counterproductive effects, however, disability simulations are considered as a common means for improving disability awareness in educational settings. The current research examines the effectiveness of disability simulations for elementary students in Korea by replicating meta-analytic research of Flower et al. (2007). Results show that the overall effect size is .80 which is different from the results of previous meta-analytic research (= .04). This research discusses the difference in results and provides practical advice that complements identified shortcomings of disability simulations.

Keywords: *disability simulation, meta-analysis, elementary student, attitude, behavior*

Introduction

In 2014 the Ministry of Education in Korea reported that more than 70% of students eligible for special education are placed in inclusive classrooms (Ministry of education, 2014). However, students in the inclusive environment do not fully enjoy the benefits of integrated education because students with and without disabilities have not reached socio-emotional integration beyond mere physical integration (Jung, Song, & Lee, 2015). According to the 4th Five-Year Plan for Special Education Development (2013-2017), the Ministry of Education

plans to solve this issue through educational programs and campaigns. For example, K-12 schools are required to provide disability awareness education at least twice a year.

Disability simulation is one of the most frequently used programs for disability awareness education (Kim, 2015; Kim, 2014). Disability simulation was developed to modify attitudes and behaviors of participants without disabilities toward persons with disabilities by raising empathy through sensitizing to limitations in everyday life activities (Kiger, 1992). Disabilities are simulated in a way that participants without disabilities experience what it is like to have a disability using devices that restricts the functions of the designated body. In the past disability simulation exercises were usually conducted as a one-time event without structured pre-education or post-discussion about participants' experiences. However, recent disability simulation programs tend to expand to a course of disability awareness programs which include information about disability, direct or indirect contact with individuals with disabilities, and group discussion. According to the 4th Comprehensive Plan of Policy for Persons with Disabilities (2013-2017) in Korea, the Ministry of Health and Welfare plans to increase the number of disability simulation participants up to 18,000 per year by the year 2017 to improve awareness of disabilities.

The effectiveness of disability simulation has been reported in many literature (e.g. Bang & Seo, 2009; Kang, Kim, Kim, Park, & Lee, 2004; Seo & Kim, 2009, Yu & Cho, 2008). Researchers noted that the simulated disability experience helped students without disabilities understand the discomfort and frustration that students with disabilities face. After the disability simulation exercise, students without disabilities were able to share empathy with their peers with disabilities and address societal responsibility for identified problems such as accessibility and equal opportunities (Yu & Cho, 2008). The simulated disability experience has been reported to have a positive correlation with attitudes toward persons with disabilities (Yuker, Block, & Campbell, 1970). These changes in perceptions and attitudes also affected changes in behavioral preferences. Among studies about the effectiveness of disability simulations, studies that used Siperstein's Activity Preference Scale observed positive behavioral changes (Bang & Lim, 2007; Lee & Lee, 2006; Na & Kim, 2004; Ryu & Kim, 2005; Yoon & Choi, 2007). However, there is a study that have found differences in the degree of effectiveness according to age. This comparative study on disability awareness in elementary, middle, and high school students noted that younger children who have attended disability awareness programs including disability simulations showed a higher capacity to accept others with disabilities. The researcher consequently stated that disability awareness programs should begin as early as possible before certain attitudes are formed for children (Kim, 2015).

Disability simulations do not seem to be conducted as a way to impose a certain perspective. Rather, there are scholars who hold a critical view of emphasizing the joy of disability simulations (French, 1992; Herbert, 2000). In that people do not easily alter their attitudes and behaviors under force (Kuno, 2009), it can be educationally meaningful that participants of disability simulation exercises rate their experiences as valuable or satisfactory (e.g. Crotty, Finucane, & Ahern, 2000; Kang, 2015).

At the same time there are critics of disability simulations who doubt the effectiveness of disability simulations. First, disability simulations are criticized for failing to simulate what is really going on with disability. Disability simulations do not provide opportunities to fully experience everyday lives of individuals with disabilities because disability simulations are conducted for a limited time (Kiger, 1992). The simulation participants know that they will return to their ordinary life right after the exercise so they do not have to make an earnest effort

to adapt to situations they have never faced. Even for the serious participants, what they can experience is at best the initial stage of disability experience which might be embarrassing and unfamiliar to anyone who has neither developed nor mastered coping skills (Olson, 2014). It is not reasonable to simulate the lives of people with disabilities only in terms of loss of function, ignoring other values of life. Even if the lives of people with disabilities are views only in terms of loss of function, disabilities are not as simple as simulated disabilities. For instance, using wheelchair does not only mean a loss of mobility. Individuals with paraplegia also experience bladder dysfunction and senselessness.

Second, those superficially simulated experiences are strongly oriented to individualized functioning limitations. Many persons with disabilities state that the impairment itself is not a core of disability experience because they can find their own coping strategies with their impairments. What makes people with disabilities disabled is psycho-social difficulties such as unemployment and resulting poverty, restricted participation in the mainstream social life due to prejudice toward people with disabilities (French, 1992). Since disability simulations activities emphasize physical difficulties, disability simulations may lead participants to a conclusion that difficulties people with disabilities experience are due to only intrinsic factors.

Third, some disability simulations knowing that simulated activities cannot provide an accurate experience, focus on emotional aspect of disabilities to develop empathy and positive attitudes (Kiger, 1992; Wurst & Wolford, 1994). However, disability simulations could potentially reinforce negative feelings related to disabilities such as low self-esteem, helplessness, humiliation, feelings of inferiority, sympathy, pity, inconvenience, and loss of control (Woo, 2015). For instance, 8 and 9 years-old students who participated in a disability simulation study reported feelings of unhappy, lonely, upset, and being treated differently (Wood, 1990 cited in French 2016). Such feelings are products of personalized reactions to disabilities which stimulate anxieties about the participants' own vulnerabilities (Siller, Chapman, Ferguson, & Vann, 1967) and an over generalization of a partial experience of being disabled influenced by pervasive negative social perceptions of disability that participants without disabilities have. Those unpleasant feelings may result in perpetuating negative attitudes toward disability rather than improving awareness of disability (Kiger, 1992). Students without disabilities who participated in a disability simulation study agree that students with disabilities have equal rights and opportunities with them. However, students without disabilities present ambivalent feelings of appreciation that they do not have disabilities (Yu & Cho, 2008)

Flower and her colleagues (2007) stated that, in their meta-analytic research of 10 disability simulation studies, disability simulation is not an effective practice. Additionally, researchers pointed out that the effects of disability simulations for children are largely unknown. Despite the controversy regarding the effectiveness of disability simulations and its potential counterproductive effects, however, disability simulations are considered as a common approach for improving disability awareness in educational settings. To investigate the effectiveness of disability simulations for children in educational settings, this study analyze research on disability simulations for elementary students published in Korea by replicating meta-analytic research of Flower et al. (2007). Specifically, this research asks the following questions:

- How effective are disability simulations in changing perception, attitudes, or behaviors of elementary students in Korea?
- Do any negative effects occur among elementary students who participate in disability simulations?

Method

Data Collection

RISS (Research Information Sharing Service), an online search engine developed by Korea

Education and Research Information Service (KERIS), was searched on Jan 2017 using the keyword ‘disability simulation’ in Korean. The search identified 18 studies, the references of which were examined to identify additional sources. Additional 11 studies were identified, resulting in a total of 29. These studies were then subjected to the following criteria for inclusion in the meta-analysis:

- Participants were placed in situations designed to help them experience what it is like to have disabilities in order to change the participants’ perceptions, attitudes, and/or behavior.
- Participants’ were elementary students.
- The study included at least one between groups (i.e., experimental and control group) comparison or at least one within-group (i.e., pre- and post-test) comparison.
- The study presented quantitative data that could be used to compute effect sizes. Means and standard deviations for both experimental and control groups or for both pre- and post- implementation were necessary. However, the study was also included if enough data were provided to compute the necessary means and standard deviations or if statistical analyses provided enough data to compute an effect size.
- The study was published in a peer-reviewed journal since year 2000.
- The study was written in Korean.

Of the 29 studies identified, eight studies met the aforementioned criteria. Many research on disability simulation which may have meaningful empirical data are excluded due to their subjects are not elementary students. Qualitative studies and quantitative studies which have incomparable data sets are also excluded.

Categorization of Studies

The eight research studies are classified based on disability, simulation format, dependent variable, age, length of time, and study design, the result of which are displayed in Table 1. First, disabilities are categorized based on how authors of each study address in their studies because most updated governmental categories of disability may not properly categorize disabilities addressed in each study which would have followed the past categories. Authors of each study categorize disabilities into physical disability (P), visual impairment (V), hearing impairment (H), communication disorder (C), learning disability (L), developmental disability (D), intellectual disability (I), autism (A), and emotional and behavioral disturbance (EBD). Unlike Flower et al. (2007), except for two studies which addressed a single disability, most studies addressed more than one disability in their simulation research. Since there are no distinct differences between studies, disability is not used as a moderator variable in this research. Second, the formats of study include presenting information, direct or indirect contact with people with disabilities, vicarious experiences, and group discussion. Most studies used combined simulation formats, whereas two studies provided a simulation exercise only. Third, dependent variables are categorized into perception, attitude, and behavior. Perception was not included in the study of Flower et al. (2007). However, two studies which included perception as their dependent variable, conceptualized it as a distinct entity in that the formation of positive attitudes requires a precedent process to correctly perceive disability (Shin, Park, & Kang, 2010).

Fourth, studies included in this research collected data from non-adult subjects. Participants of the studies were all elementary students. Finally, the length of time required to complete the simulation varied. However, most studies devoted more than 400 minutes total because they addressed more than one disability using various educational formats. Some studies stated only the number of activities instead of the length of time required to complete the activity.

Table 1. Characteristics of Studies Included in the Meta-Analysis

Study	ES	n	DC	SF	DV	Age	Duration	Study design
Bang & Lim, 2007	1.06	26	P,V,H,I	Simulation & Group discussion	Attitude	4 th	Total 800 min, 40min/each (4 times/week, 20 times)	Within Group
	1.23	26			Behavior	4 th		Within Group
Choi & Kim, 2003	.08	26	P,V,H,I	Combined all	Attitude	1 st	6 weeks	Within Group
	1.46	26			Attitude	3 rd		Within Group
	.82	26			Attitude	5 th		Within Group
	.83	26			Behavior	1 st		Within Group
	1.72	26			Behavior	3 rd		Within Group
	1.00	26			Behavior	5 th		Within Group
Chu & Kang, 2009	.55	23/20	P,V,H,I, EBD,A,L	Combined all	Behavior	5 th	Total 880 min, 40min/each (2 times/week, 22 times)	Between Groups
	1.11	23			Behavior	5 th		Within Group
Kuk & Mun, 2000	.20	230	P,V,H,I,L	Simulation	Attitude	5-6 th	Total 800min, 40 min/each (4 times/week, 20 times)	Within Group
	.29	230			Behavior	5-6 th		Within Group
Lee & Lee, 2006	.05	26	V	Simulation	Attitude	2 nd	Total 800 min, 40min/each (2 times/week, 20 times)	Within Group
	2.51	26			Behavior	2 nd		Within Group
Park & Kim, 2008	1.94	28	P,V,HC	Simulation	Perception	3 rd	Total 480min, 40min/each (2 times/week, 12 times)	Between Groups
	1.03	28			Attitude	3 rd		Between Groups
Shin et al., 2010	.35	40	P,V,H,I	Simulation	Perception	3 rd	Total 1200min, 40-80min/each (2-3 times/week, 20 times)	Within Group
	.25	40			Attitude	3 rd		Within Group
Yoon & Choi, 2007	.63	31	H	Information & Simulation	Attitude	4 th	Total 600 min, 40min/each (2 times/week, 15 times)	Within Group
	.64	31			Attitude	4 th		Between Groups
	.62	31			Behavior	4 th		Within Group
	.52	31			Behavior	4 th		Between Groups

Note. ES = effect size, DC = disability category, SF = simulation format, DV = dependent variable

Effect Size Calculation and Interpretation

Coe (2002) noted, “effect size is simply a way of quantifying the size of the difference between two groups” (para. 1). Effect size of each study is computed using Cohen’s *d* which subtracting the mean of the control group from the mean of the treatment group, or the mean of the pretest from the mean of the post-test, and dividing the deference by the pooled standard deviation of the two groups. It should be noted that one study used a measuring tool designed to have participants achieve lower scores when they possess more positive attitudes or behaviors. For the correct interpretation of the study, effect sizes of the study were inverted. According to Cohen (1988), effect sizes are categorized into three groups. Effect size of .20 or lower are interpreted as small, .50 as medium, and .80 or higher as large. The negative effect size means the control group has a better effect. In addition to Cohen’s *d*, bias corrected effect sizes (Weighted ES) using Hedges’ formula (1982) and 95% confidence intervals are presented in Table 2. For estimating more reliable heterogeneity of weighted effect sizes are also computed. Review Manage 5.3 and Center for Evaluating and Monitoring (CEM) Effect Size Calculator are used for computing the data.

Results

The results of testing heterogeneity of effect sizes indicate the presence of considerable heterogeneity of aggregated effect sizes (=81%). Thus, effect sizes are calculated using the random effects model. In addition, heterogeneity is analyzed by subgrouping moderator variables.

For the first research question, effectiveness of disability simulation, a total of 22 effect sizes are computed from the eight studies, with a median effect size of .73. The weighted d for aggregated studies is .80. The range of 22 effect sizes is .05 to 2.51. Three effect sizes are equal or less than .20, another eight are between .20 and .80, and the other 11 are over .80 in magnitude. Table 2 lists the number of computed effect sizes along with median and weighted effect size and the 95% confidence interval for moderator variables. Three of 12 median effect sizes are less than .50, another three are between .50 and .80 and the rest six exceed .80. The weighted unbiased estimates suggest .54 to 1.13 which mean medium to large effects. The 95% confidence interval for weighted effect sizes also indicate that two weighted effect sizes include zero. For the second research question, negative effects of disability simulation are not found. None of the weighted and unweighted effect sizes appear to be negative.

Table 2. Summary of Dependent Variables and Moderator Variables with Median and Weighted Effect Sizes

Variable	n of ES	Median ES	Weighted ES	95% CI	
				Lower	Upper
Desired Change					
Perception	2	1.15	1.11	-.42	2.65
Attitude	10	.64	.58	.30	.86
Behavior	10	.92	.98	.59	1.03
Format of Simulation					
Simulation	6	.32	.58	.24	.91
Simulation & Information	6	.63	.78	.25	1.31
Simulation & Discussion	2	1.15	1.13	.71	1.54
Combination	8	.92	.92	.57	1.27
Age group					
Elementary 1-2	4	.46	.83	-.15	1.81
Elementary 3-4	12	.84	.91	.61	1.20
Elementary 5-6	6	.69	.54	.27	.80
Duration					
Less than 800min	6	1.25	.86	.48	1.23
800min and more	10	.45	.67	.36	.98

Note. ES = effect size, CI = confidence interval

Dependent Variable

The effects of experiments that targeted changes in perception, attitude, and behavior are examined. All median and weighted effect sizes of this section exceed .50. Specifically, effect sizes for perception and behavior indicate large in magnitude. However, the 95% confidence interval for the effect size of perception include zero which means no statistical significance at 5% significance level.

Format of Simulations

All median and weighted effect size estimates for the various formats of disability simulation exceed .50 except for the median effect size of simulation only. Simulation and

group discussion has the highest median effect size and a weighted effect size of 1.13. The weighted effect size of combination of various formats such as disseminating information, direct and/or indirect contact with persons with disabilities is also large in magnitude.

Age Group of Participants

Next moderator variable examined the effect sizes for studies among different age groups. The age groups are categorized as shown in Table 2. All median and weighted effect sizes exceed .50 except for the median effect size for the first and second graders. The 95% confidence interval for the effect size of the first and second graders also include zero. The median and weighted effect sizes for three to fourth graders and fifth to sixth graders are large and medium in magnitude.

Duration of Simulation

Most studies reported required time for simulation exercises and frequency. Duration of simulation was converted to total minutes and categorized as shown in Table 2. The reported duration of simulations ranged from 480 to 1200 minutes. The median and weighted effect size for less than 800 minutes exceed .80. The weighted effect size for 800 min and more exceed .50 whereas the median effect size is less than .50.

Discussion

This research is conducted to investigate the effects of disability simulation for changing perception, attitude, and behavior of children in Korea replicating the meta-analysis research of Flower et al. (2007). The median and weighted effect sizes for perceptual, attitudinal, and behavioral change are within the medium to large range according to Cohen's (1988) criteria. As found in Flower et al. (2007), studies that targeted behavior changes appear to have relatively larger effects than perceptions or attitudes. Although the perceptual change leads to largest effects, effect sizes are computed from only two studies. Therefore, the stability of its effect size can be warranted with additional investigation.

The results appear to be different from the results of Flower et al. (2007). Flower and her colleagues concluded that, although the harmful effects were not observed, the disability simulation was not an effective practice either. Authors added that the effects of disability simulations for children seemed larger than those with adult participants, however, it should be noted that the effects for children were questionable due to the small number of studies available. The different results of this research from those of Flower et al. (2007) can be explained with three reasons.

First, the age difference may be a leading factor. The targeted participants of this research are children receiving elementary education. The overall effect size is .80. When the ages are categorized as shown in the table 2, effect sizes of each group ranges medium to large in magnitude. As observed in Flower et al. (2007), the simulation exercises for children brought about larger effects than those for adults. Children are in a growth phase. Considering that children are in the developmental stage of evaluating information, establishing belief system, and practicing actions, what they gain from disability simulation is more like developing attitudes rather than changing attitudes. Worchel and Shebilske (1992) describe that changing attitudes is not only different from developing new attitudes, it is also more difficult because you have to go through one more process to give up an old attitude which is a part of your system.

It should be also noted that the 95% confidence interval for the effect size of the youngest group include zero. Thus, the explanation that the simulation exercises for the younger group are not as effective as those for older children may be possible. Although Piaget explains the cognitive-developmental stage for children from 7 to 11 years old, however, differences within this age group which might help analyze current observations have been largely unknown. Further research may be needed for this difference.

Second, the formats used in the studies are another factor. Flower and her colleagues (2007) categorized formats into four types, presenting information through videotapes, contact with people with disabilities, vicarious experiences, and combination of those three. Studies in Flower et al. (2007) used only one of the four and none of effect sizes for the simulation format exceeded medium effects ($ES=.50$). Specifically, studies which used vicarious experience recorded the lowest median effect size. Even in this research, the format of simulation only has the lowest median ($ES=.32$) and weighted effect size ($ES=.58$). However, all weighted effect sizes for different formats exceed .50 in this research. Studies included in this research used at least a simulation exercise and used additional formats as needed. For example, studies which used the combination format had an educational plan to help participants a) learn about disabilities through lectures or videos, b) experience simulated disabilities, c) organize feelings and thoughts and learn from others through discussions, and d) misspell the myths and become familiar with people with disabilities through direct and/or indirect contacts. The current data appear to show that the effects of multiple uses of various means are stronger than the use of a single means. Therefore, participants of studies might have had an opportunity to complement the shortcomings of the simulation only format through various approaches.

Third, the duration of simulations for the studies in this research is considerably longer compared to Flower et al. (2007). As described above, studies in this research used a variety of simulation formats so required a longer period to complete the educational plan. Except a study which did not specify exact time required to complete the disability simulation, the mean length was about 800 minutes. Flower and her colleagues (2007) found merely small effects for all different time groups. Specifically, authors noted a smaller effect of longer activities. Even in this research, simulations of less than 800 minutes have larger effect sizes. The cause of this observation is unclear because research results on the relationship between study time and achievement are inconsistent. However, it is worthy to note that there are some studies that found inverse association between study time and grades (e.g. Greenwald & Gillmore, 1997; Olivares, 2002). Since there is a possibility that confounding variables may have affected the inverse relationship in this research, additional research is needed.

Limitations

Somewhat different results of this research may interest readers who found interests in the meta-analytic research of Flower et al. (2007). However, some inherent limitations should be noted. First, there are only small body of literature. Since this research began with the question raised by Flower et al. (2007) about the effects of disability simulations for children, only eight studies that met the aforementioned criteria were found. It was also not easy to obtain the full text of unpublished master's theses. This difficulty has created another potential limitation of publication bias. Publication bias refers to the tendency of "investigators, reviewers, and editors to submit or accept manuscripts for publication based on the direction or strength of the study findings" (Dickersin, 1990, p.1385). Relatively positive results of this research might be influenced by publication bias. Finally, studies included in this research used different

interventions, research methods, and measurement tools. Thus, finding heterogeneity between studies may be more natural. However, the considerable heterogeneity of this research may have a potential to affect the incorporation of data to elicit meaningful descriptions.

Recommendations for Practice

In 2013, the average social expenditure for people with disabilities in Organization of Economic Cooperation and Development (OECD) countries is 2.11% of Grand Domestic Product (GDP), 3.5 times higher than Korea's 0.61% (2016 Annual report on disability statistics, 2016). Korean government and society still need to pay more attention to improving disability awareness and the quality of their lives. In this sense, the quantitative expansion of disability awareness education is welcome. However, discussions should be held simultaneously to improve the quality of disability awareness education. Although the results of this meta-analytic research appear to support the effectiveness of disability simulations, it does not mean that information and recommendations suggested from individual studies critical to disability simulations can be ignored. First, many disability awareness education programs are provided as a one-time event. In such cases, a disability simulation exercise is considered an easy choice because it does not seem like you need much educational preparation and you believe that it can also be interesting to people. However, it is unreasonable to think that disability simulations is a panacea for improving disability awareness (Behler, 1993). The results from this research and Flower et al. (2007) also show that a single use of a disability simulation exercise has at most medium effects. Therefore, it is recommended that the disability simulation exercise needs complements to achieve its designated objectives, such as, disseminating information about disabilities and simulations, contacting with persons with disabilities or their family, and/or debriefing experiences with a small group. Throughout these activities, educators can place particular emphasis upon reducing adverse effects of disability simulations and improving cognitive and affective awareness of disability. For example, Behler (1993) recommends to combine disability simulations with a role-playing activity which makes it possible to control the situation and monitor elicited behavior, thereby targeting a particular educational goal. Rather than placing emphasis on disability simulations, educators can consider that disability simulations is accompanied as a part with other cumulative and organized educational efforts to improve awareness of disability (Kiger, 1992; Yoon & Kwon, 2016).

Second, it has been already discussed that disability simulations could potentially reinforce negative feelings. Disability simulation studies which measured changes of attitudes using Disability Factor Scales (Siller et al., 1967) consistently noted that participants did not show statistically significant differences or showed negative results in the factor of distressed identification (Kang et al., 2004; Lee & Hoe, 2012; Yang & Lim, 2004). These results indicate that the participants' negative reactions to disabilities are maintained or reinforced through disability simulations. Scholars suggest several ways to prevent negative emotions. The disability simulation activity should not be mysterious (Kiger, 1992) because no positive insights can be expected from participants whose abilities are deprived for the first time. Thus, it is recommended to structure the disability simulation exercise with pre-education which provides as much information as possible about the objectives of exercise, restricted functioning, possible obstacles participants may face, and coping skills and techniques. In addition, educators must create a safe environment so that participants can freely share each other's thoughts and feelings (Kiger, 1992). During a debriefing session, participants' negative experiences and feelings as well as their cognitive, affective, and moral conflicts can be discussed (Behler, 1993). However,

educators should be careful of preventing this session from becoming too depressing. Providing resources and information of available accommodations could prevent them from thinking that lives of people with disabilities are hopeless (Clark, Foos, & Faucher, 1995).

Third, Woo (2015) proposed an alternative form of disability simulation exercise. This alternative format provides a disability simulation by creating a limited environment, unlike existing disability simulations which restrict some body functions. For instance, when you experience visual impairments, the facilitator places you in a dark room without a blindfold, instead of providing a blindfold in ordinary space. The biggest conceptual difference is that the cause of disability is placed in the environment. In this case, instead of focusing on individualized functional limitations, educators can naturally lead discussions to find solutions that change the environment.

Finally, some studies understand the result that participants without disabilities feel lucky not to be disabled is a positive effect of disability simulation (Lee & Lee, 2006; Wurst & Wolford, 1994; Yoon & Choi, 2007). However, educators should be careful of interpreting an appreciation for participants' being able-bodied because their consequently raised self-esteem can be projected negatively toward people with disabilities in the form of pity or inferiority. Since disability simulations are not designed to raise participants' self-esteem about not having a disability, educators need to focus on an educational process to allow participants to experience serious social barriers to disability, critically review their perceptions of disability through internal reflection, and learn how to change these disabling social systems and infrastructures (Kuno, 2009).

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Social Positioning: Increasing the Nonsymbolic and Symbolic Communication of Students with Complex Communication Needs

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Abstract

The purpose of this single case A-B-A-B study was to determine if the dependent variables of eye gaze, vocalization, and reaching would increase among students and peers with severe and multiple disabilities and complex communication needs when the independent variable of positioning for communication and socialization (peers facing each other and no more than two feet apart) was manipulated. Speech-generating devices were also provided as part of the intervention package. Three middle school students attending a therapeutic day school participated in the study during their out-of-wheelchair time. A functional relation was demonstrated between eye gaze and social positioning across all students. However, they did not maintain these levels of communication one and two weeks after completion of the study. Future research and implications were discussed.

Keywords: *social positioning, non-symbolic communication, symbolic communication, developmental disabilities, complex communication needs, speech-generating devices*

Introduction

Communication is “both a fundamental human right and a behavior that occurs naturally across settings in the school and community” (Bailey & Murray-Branch, 1993, p. 29). Yet, individuals with severe and multiple disabilities and complex communication needs (SMD-CCN) can struggle to convey their most basic needs, experience limitations in developing and maintaining relationships, and have fewer opportunities to participate in daily life (Bailey &

Murray-Branch). Consequently, their daily life and quality of life may be compromised without appropriate supports.

Oftentimes, individuals with SMD have intellectual and physical impairments, due to a developmental disability (e.g., cerebral palsy, autism spectrum disorder, and intellectual disability), in conjunction with CCN (Buekelman & Mirenda, 2005). Students with CCN may have difficulty communicating through conventional, symbolic means which can interfere with daily activities and communication (Clendon, Sturm, & Cali, 2013; Douglas, Light, & McNaughton, 2013). Symbolic communication includes but is not limited to speech, speech-generating devices (SGDs), written language, sign language, or picture communication systems. Non-symbolic communication is a means of communicating and can include but is not limited to using vocalizations, eye gaze or eye contact, reaching, body movement, or methods that are unique to the individual (Beck, Stoner, & Dennis, 2009; Bunning, Smith, Kennedy, & Greenham, 2013; Dennis, 2002; Houghton, Bronicki, & Guess, 1987; Snell, 2002).

Theoretical Framework

The theoretical framework for this study was based on a combination of Albert Bandura's work in human thought and behavior as described in *Social Learning Theory* (1977) as well as Jerome Bruner's ideas of education theory as conveyed in *The Process of Education: A Landmark in Educational Theory* (1977). Social Learning Theory suggests that individuals can learn by observing the actions of others and Bruner's educational theory is grounded in the ideas that individuals must have structure, be ready to learn, and have a desire to learn. In this study, the participants were positioned in proximity to one another for socialization with their peers. In this position, they could observe each other and interact together in an environment that promoted success.

Social Positioning

The positioning of individuals with SMD-CCN can influence the development of basic social-communication skills (McEwen, 1992). Communication attempts, whether symbolic or non-symbolic, must begin with the opportunity to communicate and physically positioned to have the best chance for interaction. Numerous researchers have emphasized positioning individuals with SMD-CCN for functional purposes, such as for therapeutic benefit or SGD use (Costigan & Light, 2011; Hulme, Gallacher, Walsh, Niesen, & Waldron, 1987; McEwen & Karlan, 1989; McEwen & Lloyd, 1990; Nwaobi & Smith, 1986). However, with the exception of McEwen and Karlan, these authors focused their studies mainly on seating in wheelchairs. These studies emphasized that positioning can facilitate peer interaction (Causton-Theoharis & Malmgren, 2005a; Causton-Theoharis & Malmgren, 2005b), improve breath support for vocalization (Nwaobi & Smith), enhance functional activities (McEwen, 1992), and increase access to SGDs and communication aids (McEwen & Karlan). Social positioning (i.e., a term the authors used for positioning individuals with SMD-CCN in order for them to communicate socially with peers as opposed to communicating wants and needs) can be accomplished by placing individuals in proximity (no more than two feet) and having individuals face each other. Providing access to SGDs with appropriate messages for communicating and socializing with peers is also important for maximizing their symbolic communication.

Social positioning is important for individuals with SMD-CCN as they are frequently out of their wheelchairs during the day. Adaptive equipment “such as wedges, sidelyers, standers, adapted chairs, and different types of wheelchairs” (McEwen & Lloyd, p. 21) are oftentimes required for comfortable repositioning. Repositioning is usually necessary throughout the day to perform various functional tasks, increase participation, relieve pressure, manage muscle tone/contractures/abnormal reflexes, improve breathing, and to relax (Costigan & Light, 2011; McEwen, 1992; McEwen & Karlan, 1989; McEwen & Lloyd, 1990; Nwaobi & Smith, 1986). Furthermore, specific positioning of individuals with SMD-CCN can increase their functional communication and communicative abilities (McEwen & Lloyd).

Eye gaze. Eye gaze or eye contact is one means to express preferences and interact non-symbolically (Houghton et al., 1987). Socially, eye gaze can be used to supply information, regulate social interactions and social control, convey intimacy, and enrich communication and cooperation (Kaartinen et al., 2012). Increasing opportunities for eye gaze through social positioning in proximity with peers can facilitate the interaction of individuals with SMD-CCN.

Vocalization. Vocalization is another non-symbolic form of communication for individuals with SMD-CCN (Houghton et al., 1987). Positioning for communication can increase respiratory function and improve vocalizations (Nwaobi & Smith, 1986). Many individuals with SMD-CCN are nonspeaking and may only be able to vocalize or make subtle movements (Bunning et al., 2013), thus attention to their positioning is critical so that they can communicate in the most effective and efficient way.

Reaching. Body movement, such as attempting to reach, is a form of non-symbolic communication, especially for individuals with physical limitations (Houghton et al., 1987). Positioning of individuals with SMD-CCN can increase hand function (McEwen & Karlan, 1989) and overall upper extremity function (Nwaobi & Smith, 1986), which can improve the ability to reach toward their peers and increase socialization attempts. Proper positioning can also increase the ability to activate a speech-generating device (SGD).

SGDs. Individuals with SMD-CCN can benefit from the use of SGDs (Stoner, Angell, & Bailey, 2010). In order for a student to use SGDs, it is crucial for him or her to be positioned so that it is possible to reach and activate the SGD. For example, if a student has access to a SGD but is not positioned for communication, he or she is unable to effectively communicate with a partner. McEwen and Karlan (1989) studied students in different positions and found that many positioning options were available, but that the success of SGD and other communication aid use in each position was dependent on the individual.

Communication Partners

Carter, Sisco, Chung, and Stanton-Chapman (2010) emphasized “the relationships students have with their peers can make important contributions to social and emotional development, promote success in school, and enhance overall quality of life” (p. 63). Much of the literature that addresses the communication of students with SMD-CCN focuses on interactions with the staff members who care for them (Bunning et al., 2013; Houghton et al., 1987; McEwen, 1992) or communication opportunities with typically developing peers (Arthur,

Bochner, & Butterfield, 1999; Sigafoos, 1999). However, even in this era of inclusion, many students with SMD-CCN are in segregated classrooms and in closer proximity to students with similar needs and abilities. According to the U.S. Department of Education's National Center for Educational Statistics (2012, Table 46), students with disabilities are actually spending more than half of their time in a segregated setting or in some cases all of their time in a segregated setting. Given this, it becomes important for students with disabilities to be able to communicate with each other. Because communication can occur at any time during the day, the time spent out of the wheelchair may be ideal for social communication with peers. Yet, unless the individuals are properly positioned for communication, this time is lost.

Purpose of the Study

The purpose of this study was to determine if the positioning of students with SMD-CCN would increase their non-symbolic communication. The specific research questions that guided this study were: (a) Will social positioning increase the non-symbolic communication of eye gaze, reaching, and vocalizations for students with SMD-CCN? and (b) Will students maintain their communication after the final intervention condition of the study?

Methods

Participants

Two male students (pseudonyms were Terry and Julian) and one female student (pseudonym was Gianna) from different school districts attending a private, therapeutic day school in a middle school classroom participated in the study. All three students had SMD-CCN, gastrostomies for nutrition and hydration, and wheelchairs for mobility. The inclusion criteria consisted of (a) middle school age students with SMD-CCN, (b) students who required repositioning out of their wheelchairs at least once per school day, (c) students with communication goals focused on SGD activation, (d) students who had some active movement of their upper extremities in order to indicate reaching, (e) students with the ability to access a SGD in some way, and (f) guardian consent.

Julian. Julian was an 11-year-old, Caucasian male with a diagnosis of 1Q chromosome deletion syndrome, dysgenesis of the corpus collosum, seizure disorder, and hypospadias with severe developmental delay. He had a tracheostomy with a speaking valve and limited upper extremity mobility due to uncontrolled movements. His IEP stated that he had severe to profound cognitive and physical impairments. He communicated with vocalizations, facial expressions, body movement, eye gaze, pictures, and a variety of SGDs when available (BIGmack¹TM, LITTLEmack²TM, LITTLE Step-by-Step³TM, Twin Talk⁴TM, TalkableIII⁵TM). He communicated his preferences, yes and no, and physical feelings regularly with at least 75% accuracy overall according to his most recent speech-language pathology annual evaluation. He was often alert and responsive to communication partners. During a typical day, he participated in the classroom curriculum, one or more group therapies (e.g., speech therapy, occupational therapy, recreational therapy, music therapy, physical therapy), and relaxation time out of his wheelchair repositioned in a Tumbleforms2⁶TM chair. Julian sat in the Tumbleforms2 chair in all conditions of the study.

Gianna. Gianna was a 10-year-old, Hispanic female with a diagnosis of metachromatic leukodystrophy. Her IEP stated that she had profound cognitive and physical impairments. She communicated non-symbolically through eye gaze and facial expressions to express physical feelings and to make choices. Prior to this study, as reported by her father to the classroom teacher, Gianna had never used a SGD or pictures for communication and she had never been enrolled in school until the year of the study. She used a SGD for the first time during this study after a speech-language evaluation. She activated the LITTLEmack by facial movements registered by a Twitch Switch⁷TM secured near the corner of her mouth with medical tape. She acquired this switch and SGD during the fourth intervention session and continued using them through the remaining observations during both intervention conditions. Gianna was alert about 50% of the day and responded intermittently to communication partners as stated on her most recent speech-language pathology annual evaluation. She participated in similar activities and therapies as Julian. During time out of her wheelchair throughout the study, she was positioned side lying on the same wedge.

Terry. Terry was a 13-year-old, Caucasian male with a diagnosis of cerebral palsy. His IEP stated that he had severe to profound cognitive and physical impairments. Terry's motor movements were uncontrolled and he had limited upper extremity mobility. Terry communicated non-symbolically with vocalizations, facial expressions, body movements, eye gaze, and used pictures with eye pointing for communication on occasion. He used a variety of SGDs (Twin Talk, LITTLEmack, and LITTLE Step-by-Step) as well as an ECO⁸TM with ECO point⁹TM communication device mounted to his wheelchair. He used his ECO by selecting messages using eye gaze (e.g., color choices, biographical information, activity preferences). He was moderately accurate when activating it though appeared to lack motivation to use it. This opinion was corroborated by his most recent speech-language pathology annual evaluation. He did not use the ECO during this study as he had difficulty accessing it when appropriately positioned out of his wheelchair. He communicated choices, yes and no, physical feelings, basic concepts, and preferences in these ways regularly with about 80% accuracy overall. He was often alert, aware of his peers, and appeared to respond to communication partners. During school, he participated in the classroom curriculum, group therapies, and relaxation time out of his wheelchair positioned prone over a wedge. He was positioned prone over a wedge in all conditions.

Setting and Materials

The students attended a private, state-certified, therapeutic day school dedicated to serving students aged 3 to 21 with SMD-CCN in a Midwestern state. All 25 students in the school received services from a nurse, speech-language pathologist, physical therapist, occupational therapist, occupational therapy assistants, recreational therapist, and music therapist throughout the week. The study took place in a middle school classroom staffed with a certified special educator, three paraprofessionals, and seven students. The classroom was roughly 400 sq. ft (121.9 sq. m), with one side dedicated to academics (table, instructional materials, books) and the opposite side reserved for repositioning (mats, wedges, standers, Tumbleforms² chairs). The study took place when the students were out of their wheelchairs for repositioning on weekdays between approximately 11:00 a.m. and 1:00 p.m. Staff members were present during the study.

The first author videotaped the students when they were out of their wheelchairs during all study conditions. Each student was videotaped for 10 min using either a Canon Powershot

G12 10.0 MP Digital Camera¹⁰™ or a Sony Cyber-shot DSC-T5¹¹™ Digital Camera. The first author viewed the videos daily to collect data on the number of eye gazes, vocalizations, reaches toward a peer, and SGD activations.

The SGD offered by staff members for the students to use during intervention and maintenance sessions included but were not limited to: BIGmack, LITTLE Step-by-Step, Twin Talk, and Talkable III. SGDs were programmed to provide simple messages, such as, *“Hi, How are you?” “How was your weekend?” “I like that music. Play some more!”* or recorded with music as if the student was singing.

Response Definitions and Recording Procedures

The communication behaviors observed throughout the study included eye gaze, vocalization, and reaching. SGD activations were tallied only during the intervention conditions. Eye gaze was recorded any time the student looked in the direction of a peer with whom he or she was paired. Vocalization was recorded as any vocalization that occurred when the student looked at a peer or in response to interaction with the peer with whom he or she was paired (within 20 s of the dyad partner using his or her SGD, vocalizing, reaching for, touching, or looking at the student). Reaching was recorded any time a student reached toward or touched a peer. SGD activation was recorded any time the student activated his or her SGD or a switch connected to the SGD.

The first author developed a direct observational recording system for the study. In particular, she used event recording to tally each instance of eye gaze, vocalization, reaching, and SGD activation. She watched video recordings of each student for 10 min per day during each condition of the study (baseline, intervention, and maintenance) to collect the data.

Research Design

This study used a single case withdrawal design (Gast, 2010) with five conditions presented in the following order: baseline (A₁), intervention (B₁), baseline (A₂), intervention (B₂), and maintenance. The withdrawal design allowed us to determine if there was a functional relation between the intervention of the social positioning intervention package (students facing each other, no more than two feet apart, with access to a SGD) and the students' non-symbolic communicative behaviors (i.e., eye gaze between students, reaching for another student, and vocalizations) through the repeated introduction and withdrawal of the intervention package. The mean and range per condition were calculated and a visual analysis of the change in level and trend of the data across conditions for each behavior took place. Specifically, the relative and absolute level change and percentage of non-overlapping data (PND) across adjacent conditions illustrated the magnitude of effect for a population of students where small changes are significant. These are described below.

Between conditions relative level change. To determine the between conditions relative level change, we (a) found the median of the last half of the first condition and the median of the first half of the second condition, (b) subtracted the smaller from the larger, and (c) determined if the level of the data were increasing or decreasing (Gast, 2010).

Between conditions absolute level change. To ascertain the between conditions absolute level change, we (a) compared the last data point in the first condition to the first data point in the second, (b) subtracted the smaller number from the larger, and (c) concluded the level change had increased or decreased (Gast, 2010).

PND. To find the PND, we (a) found the data range in the first condition, (b) noted how many data points from the second condition were outside of the range found in the first condition, (c) divided the number of data points outside the range of the first condition by the total data points in the second condition, and (d) multiplied by 100 (Gast, 2010).

Procedures

Baseline. During A_1 and A_2 , the students were positioned out of their wheelchairs by the staff and SLP (first author) in a typical arrangement (on positioning wedges or in Tumbleforms2 chairs up against a wall around the periphery of the classroom) that was observed before the study began. Students were positioned in the same manner daily. See Figure 1 for a graphic representation of the classroom during baseline. Students did not have access to a SGD when out of their wheelchair. Each session was videotaped in order to collect data. The first author arranged the video cameras in a position that would capture the communications of the students. She placed each camera as close to the student(s) being recorded as possible at an angle that allowed her to see each student's eye gaze to their partner. She taped the students for 10 min (generally in the beginning of their out of wheelchair time, but occasionally in the middle or at the end of their out of wheelchair time due to changes in staff schedules) sometime between 11:00 a.m. and 1:00 p.m. on weekdays a total of seven times during A_1 and five times during A_2 . The first author collected data on the three non-symbolic target behaviors by viewing the videos after the students were dismissed from school.

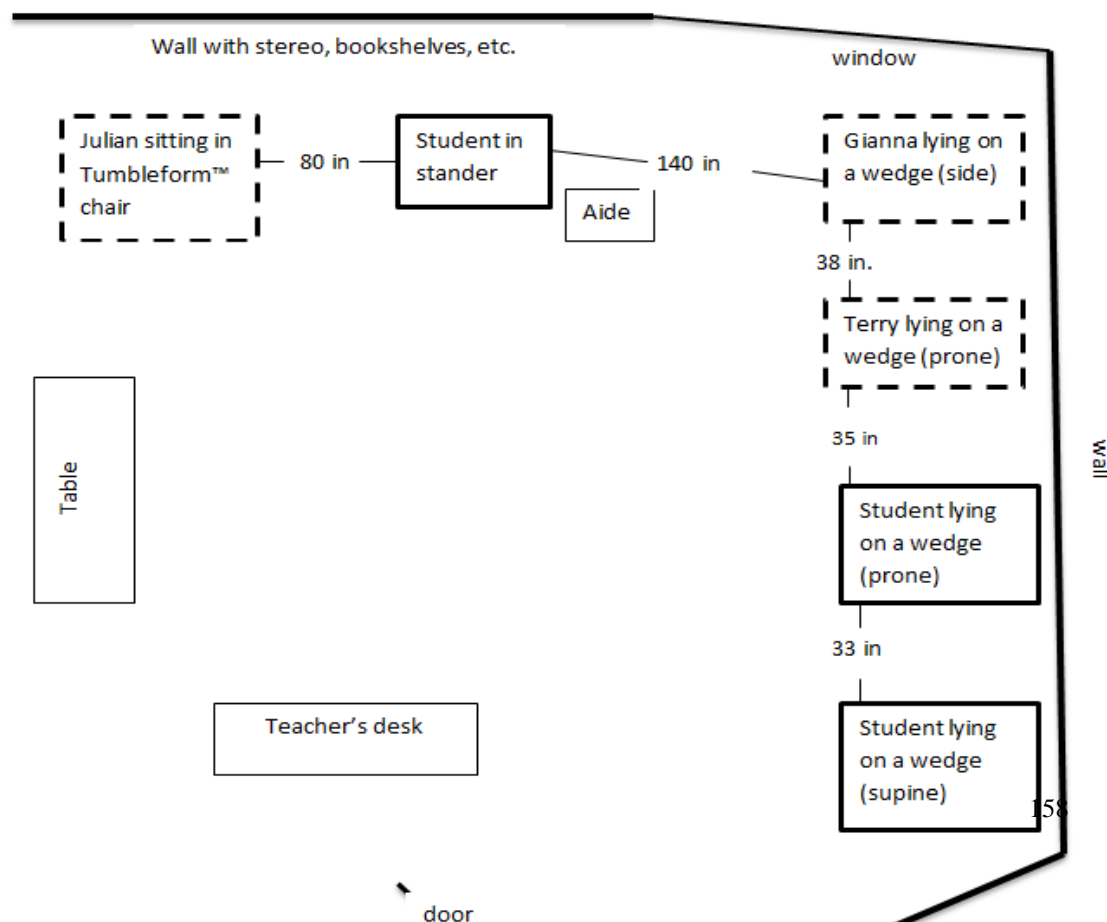


Figure 1. Typical classroom arrangement during baseline observations. The middle to right side of the classroom is shown. Students participating are denoted by dashed boxes. Other students in the classroom are denoted by boxes with solid lines. The distance between students was measured from head to head and noted between the solid lines between each student.

Staff preparation. After the first baseline condition (A_1), the first author explained social positioning to the four staff members in the classroom in a 15-min session in the classroom. She (a) presented the staff with the rationale of the study, (b) described how to position the students to promote peer interactions, (c) provided a demonstration of proper positioning, (d) discussed placement SGDs, and (e) answered questions. This informational session prepared the staff to assist the first author with social positioning during intervention and then maintain the positioning after the study was completed.

Intervention. At the beginning of each intervention session (B_1 and B_2), the first author recorded the students in attendance for that particular day, made a diagram of how to position each student, and shared the diagram with the staff members in order to utilize their assistance in positioning the students. Communicative partners were chosen based on convenience with study participants and nonparticipants.

The staff members, with assistance from the first author and using the diagram, positioned the students during their out-of-wheelchair time. Students were no more than two feet (.60 m) from each other (as the first author measured using a standard measuring tape), facing each other. SGDs with pre-recorded greetings, comments, questions, or music were placed next to the student's dominant hand. The students were able to reach the SGDs or had access to the SGD via a switch connected to the SGD. See Figure 2 for an example of positioning during the intervention condition. Sessions were videotaped in the same manner as during baseline. Data were collected on the three non-symbolic communicative behaviors in addition to SGD activation.

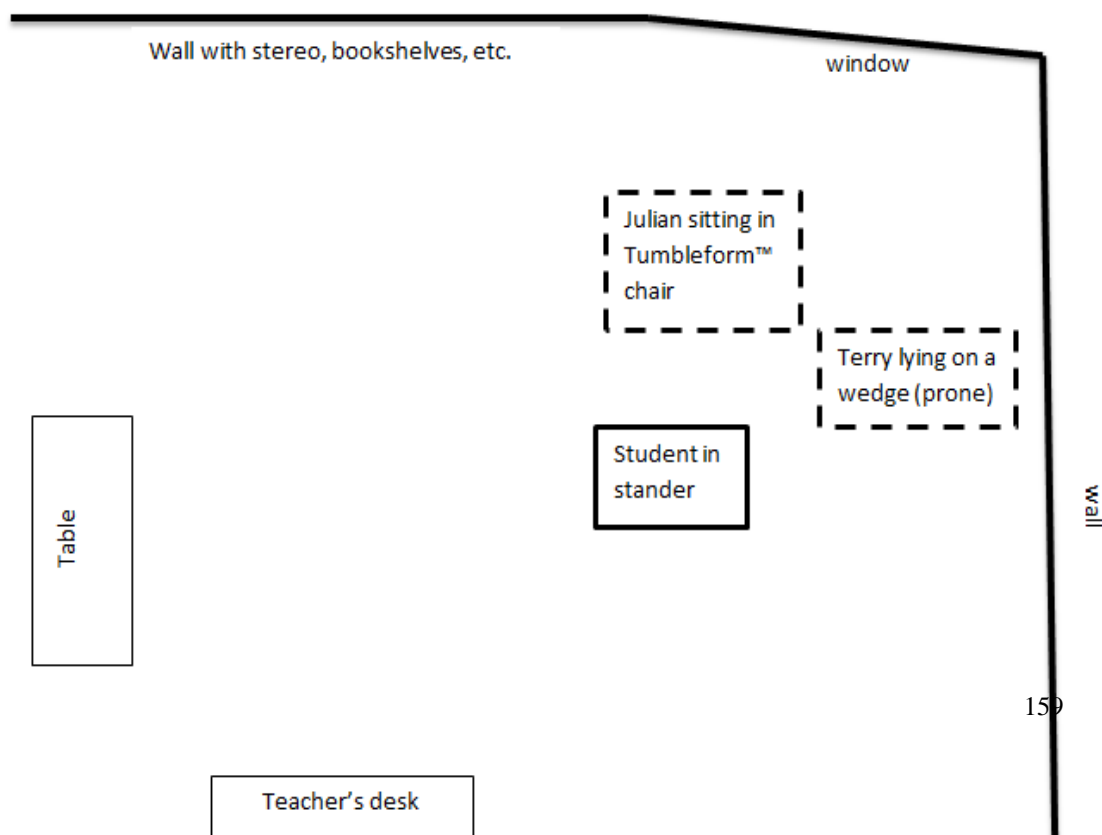


Figure 2. Example of positioning during the intervention condition. The middle to right side of the classroom is shown. The left side of the classroom included a changing table, closet, and storage space for wheelchairs. Students not participating in the study are denoted by boxes with solid black lines. The distance between students was measured from head to head to be 2 feet (24 inches) or fewer.

Maintenance. Maintenance sessions were conducted at one and two weeks following the final session in the second intervention condition (B₂). Staff independently positioned the students without any help or cues from the first author. The video cameras were set up in the same manner and at the same time of day as the other conditions. Students were videotaped for 10 min each to determine if there was carryover of peer socialization. Data were collected on the three target behaviors and SGD activation.

Reliability

Procedural Reliability. At the start of each session, the first author completed the steps on the following procedural checklist: (a) take attendance, (b) make a diagram of the desired student positions and sharing the diagram with the staff members, (c) assist the staff to position the students, (d) set up the video camera, and (e) write down the type of SGD each student was given. The second author was provided with diagrams and videos to score the procedural reliability for at least 20% of the sessions in each condition. Procedural reliability was calculated by dividing the number of observed behaviors by the number of opportunities to observe the behavior and multiplying by 100 (Billingsley, White, & Munson, 1980).

Interobserver Agreement. The second author also viewed at least 20% of the videos in each condition to determine interobserver agreement (IOA) on each dependent variable. The first author trained the second author on reliably observing the target behaviors (counting how many instances of eye gaze to a partner, vocalizations to a partner, reaches toward a partner, or SGD activations were completed per 1-minute intervals). Training occurred prior to the start of the start with nonparticipants and until the second author met the criteria of at least 95% correct for two consecutive sessions. Each 10-minute session was divided into 1-minute intervals. IOA was calculated by dividing the number of agreements per 1-minute interval by the number of agreements plus disagreements and multiplying by 100 (Gast, 2010). IOA was calculated and reported for each target behavior in each condition.

Results

The data from this study were analyzed visually to determine the effectiveness of social positioning on the target behaviors (see Figure 3 for data on each target behavior for each student). In addition, Tables 1, 2, and 3 present the mean and range occurrences, between condition level changes, and PND for each target behavior across conditions for Julian, Gianna, and Terry, respectively. SGD data were also presented in these tables.

All three students increased their communication during both intervention conditions. Julian communicated through eye gaze and vocalizations (though his vocalizations did not return to baseline levels in A_2), while Gianna and Terry increased their eye gaze toward a peer. Julian and Gianna did not reach toward a peer at any time and Terry only reached occasionally. Maintenance data were variable across students. A functional relation was demonstrated for eye gaze for each student. All students activated their SGD when it was presented during intervention.

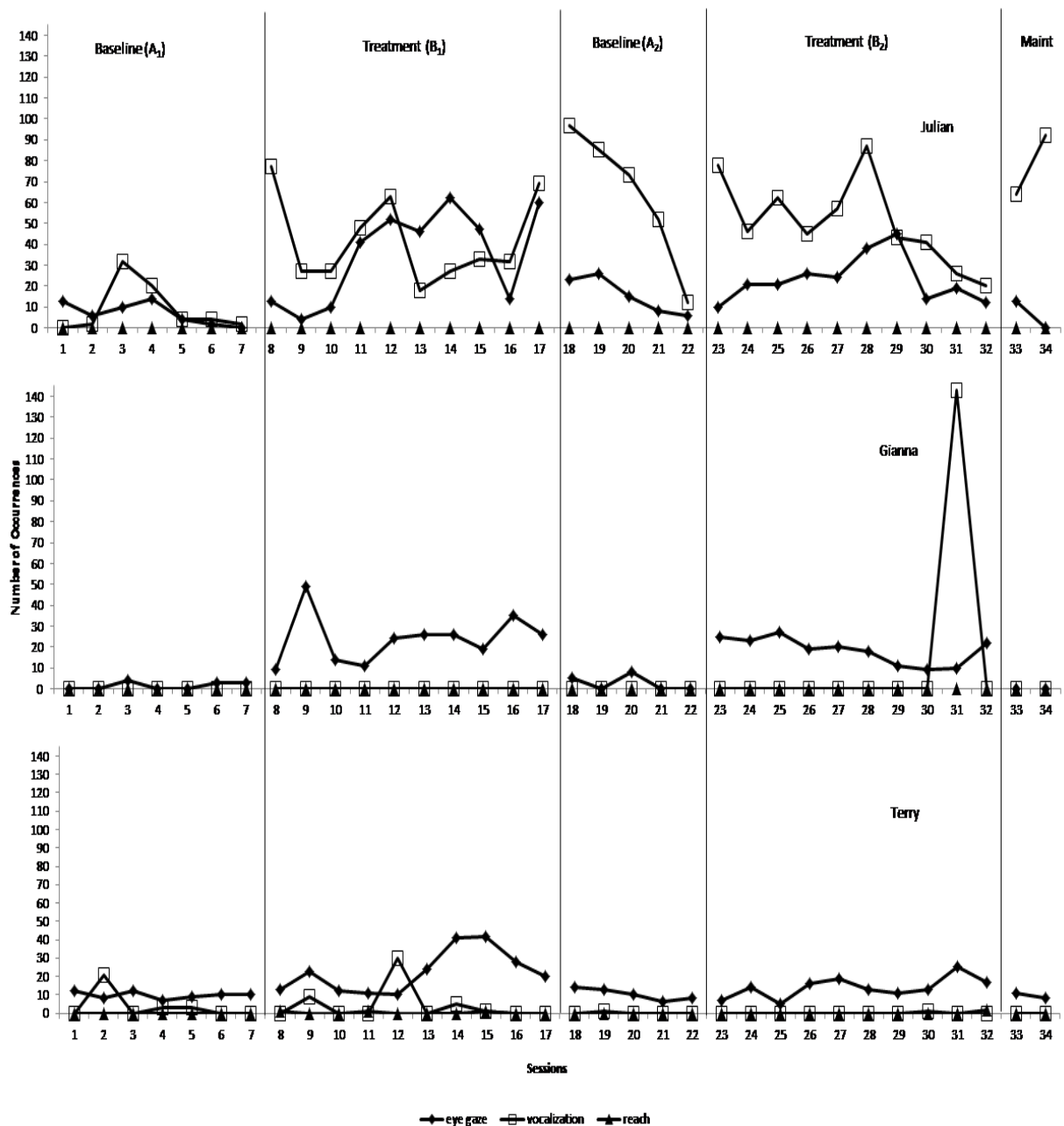


Figure 3. Participant communicative behaviors observed in each condition. Eye gaze is noted with a closed diamond, vocalization with an open square, and reaching with a closed triangle

Julian

During both baseline conditions, Julian demonstrated low and stable data for all of the target behaviors except for vocalizations. During A₁, vocalizations started and ended low (0-4 occurrences) but had a spike during sessions three and four with 32 and 20 occurrences respectively. During A₂, vocalizations had a decelerating trend which overlapped with intervention data in B₁ and B₂. During B₁, Julian had an increase in level for all behaviors except for reaching, which remained at zero throughout. Data followed similar data patterns during the second intervention condition (B₂).

The similarities between the number of occurrences of each behavior in similar conditions and the differences in the number of occurrences between adjacent conditions are clearly portrayed in Table 1. The higher the relative and absolute level change, the stronger the demonstration of effect or impact of the intervention. The relative level changes were high for eye gaze but lower for vocalizations and zero for reaching. The absolute level changes were also high for all behaviors across all condition comparisons except for vocalization during B₁ and A₂. Additionally, it is preferable to have high PND, which strengthens the demonstration of effect. Julian's PND was high for eye gaze and vocalizations between A₁ and B₁. A functional relation was demonstrated for eye gaze through the change in level, immediacy of effect, and PND. During maintenance, staff positioned Julian for social positioning. Julian's vocalization data were accelerating, but eye gaze data were decelerating and reaching data had zero celeration. Julian consistently activated his SGD when it was presented.

Table 1. Julian's Data

Target behavior	Mean (range) occurrences				
	A ₁	B ₁	A ₂	B ₂	Maintenance
Eye gaze	7(0-14)	39(10-62)	16(6-26)	23(10-45)	7(0-13)
Vocalization	9(0-32)	42(18-77)	64(12-97)	51(20-87)	78(64-92)
Reaching	0(0-0)	0(0-0)	0(0-0)	0(0-0)	0(0-0)
SGD activation		266(60-461)		230(33-477)	0(0-0)
Target behavior	Between conditions relative level change				
	A ₁ & B ₁	B ₁ & A ₂	A ₂ & B ₂	B ₂ & Maintenance	
Eye gaze	38	22.5	14	-11.5	
Vocalization	44	-58	25	-37	
Reaching	0	0	0	0	
Target behavior	Between conditions absolute level change				
	A ₁ & B ₁	B ₁ & A ₂	A ₂ & B ₂	B ₂ & Maintenance	
Eye gaze	13	37	4	1	
Vocalization	74	-28	66	44	

Reaching	0	0	0	0
Target behavior	PND			
	A ₁ & B ₁		A ₂ & B ₂	
Eye gaze	70%		20%	
Vocalization	50%		0%	
Reaching	0%		0%	

Note. The data displayed includes the mean number of times and range in number of times Julian completed a target behavior, relative and absolute level changes, and percent of non-overlapping data (PND).

Gianna

Gianna demonstrated zero or near zero levels for all behaviors across each baseline condition prior to the introduction of the intervention conditions. Conversely, the level increased for eye gaze during both intervention conditions. For vocalization, she demonstrated zero celeration until B₂ where one data point drastically increased to 148 occurrences but did not maintain. She had not been observed vocalizing before this session. Gianna's data remained at zero for reaching. There were similarities between the number of occurrences of each behavior in similar conditions as well as level changes between adjacent conditions for eye gaze as demonstrated in Table 2. PND was high for eye gaze between A₁ and B₁ as well as A₂ and B₂. A functional relation was established for eye gaze. During the maintenance condition, staff positioned Gianna for social positioning. Gianna's data demonstrated zero celeration for eye gaze, vocalization, and reaching. Gianna activated her SGD intermittently when it was offered throughout the study.

Table 2. Gianna's Data

	Mean (range) occurrences				
Target behavior		B ₁	A ₂	B ₂	Maintenance
Eye gaze	1(0-4)	24(9-49)	3(0-8)	18(9-27)	0(0-0)
Vocalization	0(0-0)	0(0-0)	0(0-0)	15(0-148)	0(0-0)
Reaching	0(0-0)	0(0-0)	0(0-0)	0(0-0)	0(0-0)
SGD activation		1(0-3)		6(1-19)	1(0-2)
	Between conditions relative level change				
Target behavior	A ₁ & B ₁	B ₁ & A ₂	A ₂ & B ₂	B ₂ & Maintenance	
Eye gaze	8	23.5	23	-11	
Vocalization	0	0	0	0	
Reaching	0	0	0	0	
	Between conditions absolute level change				
Target behavior	A ₁ & B ₁	B ₁ & A ₂	A ₂ & B ₂	B ₂ & Maintenance	
Eye gaze	6	21	25	-22	
Vocalization	0	0	0	0	
Reaching	0	0	0	0	
	PND				
Target behavior	A ₁ & B ₁			A ₂ & B ₂	
Eye gaze	100%			100%	

Vocalization	0%	10%
Reaching	0%	0%

Note. The data displayed includes the mean number of times and range in number of times Gianna completed a target behavior, relative and absolute level changes, and percent of non-overlapping data (PND).

Terry

Terry demonstrated low baseline data with some variability prior to the onset of intervention conditions. After the introduction of the positioning intervention, eye gaze data increased more toward the end of the intervention conditions while vocalization and reaching data remained similar to baseline data. Table 3 provides Terry's within and between conditions data. Changes in level were small for eye gaze and vocalizations and nonexistent for reaching. Terry had high PND for eye gaze between A₁ and B₁. Eye gaze data illustrated a function relation. During the maintenance condition, staff positioned Terry for social positioning. Terry's eye gaze data slightly decelerated and had a similar level as the baseline data while his vocalization and reaching data were at zero. Terry activated his SGD frequently when it was offered.

Table 3. Terry's Data

Target behavior	Mean (range) occurrences				
	A ₁	B ₁	A ₂	B ₂	Maintenance
Eye gaze	10(7-12)	22(10-42)	10(6-14)	14(5-25)	10(8-11)
Vocalization	4(0-21)	5(0-30)	0(0-1)	0(0-1)	0(0-0)
Reaching	0(0-0)	0(0-1)	0(0-0)	0(0-2)	0(0-0)
SGD activation		10(4-18)		11(0-25)	0(0-0)
Target behavior	Between conditions relative level change				
	A ₁ & B ₁	B ₁ & A ₂	A ₂ & B ₂	B ₂ & Maintenance	
Eye gaze	2	14.5	7	-3.5	
Vocalization	0	-0.5	0	0	
Reaching	0	0	0	0	
Target behavior	Between conditions absolute level change				
	A ₁ & B ₁	B ₁ & A ₂	A ₂ & B ₂	B ₂ & Maintenance	
Eye gaze	3	6	-1	-6	
Vocalization	0	0	0	0	
Reaching	1	0	0	-2	
Target behavior	PND				
	A ₁ & B ₁		A ₂ & B ₂		
Eye gaze	70%		40%		
Vocalization	10%		0%		
Reaching	30%		10%		

Note. The data displayed includes the mean number of times and range in number of times Terry completed a target behavior, relative and absolute level changes, and percent of non-overlapping data (PND).

Reliability

Procedural reliability. At least 20% (range: 20-29%) of all sessions in each condition had procedural reliability data collected across each student. The mean procedural reliability across all students and conditions was 100%.

Interobserver agreement. During a minimum of 20% (range: 20-29%) of all sessions in each condition, IOA was calculated for each target behavior. The mean IOA for eye gaze across conditions was 81% (range: 70%-100%) for Julian, 95% (range: 80%-100%) for Gianna, and 81% (range: 65%-100%) for Terry. Percentages of IOA data for eye gaze were lower as eye gaze was difficult to measure at times given the video recording. The mean IOA for vocalizations was 90% (range: 75-100%) for Julian, 100% for Gianna, and 98% (range: 90%-100%) for Terry. The mean IOA for reaching was 100% for Julian, 100% for Gianna, and 99% (range: 95%-100%) for Terry. The mean IOA for SGD was 94% (range: 75%-100%) for Julian, 99% (range: 90%-100%) for Gianna, and 97% (range: 90%-100%) for Terry.

Discussion

Existing research with this population found that positioning in adaptive seating devices increased reaching and socialization (Hulme, Gallacher, Walsh, Niesen, & Waldron, 1987), increased lung capacity which had implications for speech (Nwaobi & Smith, 1986), increased student peer interactions after paraprofessional training (Causton-Theoharis & Malmgren, 2005a), and increased interactions when students needing high intensity of supports were out of their wheelchairs (McEwen, 1992). Despite differences in the aforementioned research with this population and positioning in general, the previous studies showed either increased socialization with proper positioning when participants were in or out of their wheelchairs, or increased interaction with peers given staff training.

To further this line of research, the results of this withdrawal design study indicated that when students were taken out of their wheelchairs for repositioning, they demonstrated increased communication for socialization when positioned facing each other, two feet or less from one another, and given SGDs. While a clear functional relation was only demonstrated for eye gaze, there was an increase in vocalizations too. Students also used their SGD when they were provided; however, specific SGD training is warranted to further increase usage and ensure intentionality.

Specifically, this study extends the literature on the communication of individuals with SMD-CCN by showing that communication can be promoted and can occur when individuals are appropriately repositioned out of their wheelchairs near their peers. In fact, it shows that repositioning time is a good time for individuals with SMD-CCN to socialize with their peers and should not be looked at as an unproductive time. Though the improvements were small in this study, simply giving individuals with SMD-CCN an opportunity to communicate can make a difference in their world. Social relationships have the chance to be formed, friends can be made, and social learning may occur when individuals interact with each other.

Julian. During social positioning, Julian increased his eye gaze and vocalizations. Reaching remained at zero throughout all conditions however. Julian's SGD activations, like the other students, were tallied any time he activated a SGD and he often activated it repeatedly. He appeared to enjoy a variety of SGDs (e.g., single, dual plate, or multiple message SGD) with

specific messages (e.g., “*Hi, Mike*” and “*Play me some music!*”) or with music recorded on them as evidenced by increased smiling and vocalizations. Although it is likely that many of his communications were intentional, it appeared as though he also liked the act of activating a SGD as his activations were continuous at times. Furthermore, Julian pressed a SGD recorded with music several times (which we interpreted as a form of singing) and it is possible that his peers’ responses may have been increasingly motivating for him. It is also possible that he enjoyed playing music for himself.

Gianna. During baseline conditions, Gianna often fell asleep, but during intervention conditions she was able to stay awake. In fact, if she began to close her eyes and a peer would activate his or her SGD to communicate with her, she would open her eyes and eye gaze in his direction. Gianna’s Twitch Switch was always connected to a SGD with multiple message capability. In general, her SGD was programmed with messages such as “*Hi, Terry,*” or “*How’s it going?*” etc. During the ninth intervention session of B₂, Gianna greatly increased her number of vocalizations, which was rare for her. It is unclear why she vocalized so much at this particular time. Except for this one instance, vocalizations and reaching remained at zero throughout the study. She showed the greatest increase in eye gaze during the social positioning intervention.

Terry. Terry demonstrated one instance of more than typical vocalization during A₁, but it was determined that this vocalization was directed at a staff member (whom he also followed with his gaze) as he apparently required a diaper change and did not prefer to be wet/soiled. His vocalizations decreased after he was changed. During both intervention conditions, Terry demonstrated an increase in eye gaze. His vocalizations decreased when he had the opportunity to use his SGD (most often a dual plate SGD or a multiple message SGD on occasion) with specific messages on it (e.g., “*Hi, Gianna!*” and “*How was your weekend?*”). Terry demonstrated variable and often erratic vocalizations throughout the study. It is possible that it was more difficult for him to vocalize in the prone position that he maintained in during out of wheelchair times for respiratory purposes. He did, however, have much more consistent increases in eye gaze during B₁ and B₂. In his wheelchair he used an eye gaze communication device, but in a prone position, he exhibited improved upper extremity movement and he was able to use SGDs that he could activate with his hands.

Limitations

First, this study had a small sample size and non-random sampling techniques given the population of students; however, this is common and appropriate in single case research. Second, SGDs were not provided in baseline conditions because they were a part of the social positioning intervention package, so a functional relation could not be determined between social positioning and SGD use. The number of SGD activations may have been due to availability. Future studies should assess SGD use across all conditions to ensure that positioning alone causes the increase in SGD use. Third, intentionality of communication was not a measure of this study and needs to be in the future. For example, creating a response definition for meaningful vs. accidental communicative behaviors would be important for determining the true communication intentions between baseline and intervention conditions. Fourth, the intervention was researcher directed and not teacher or staff directed. The researcher assisted with positioning through the

intervention conditions, which may have contributed to the decreased carryover into the maintenance condition. Future studies should collect fidelity data on the staff training and implementation procedures in addition to having the researcher present for support through staff coaching and cueing during B₁ and B₂ if necessary. Fifth, the responses of the communication partners were not measured. This could have provided information on the responsiveness or lack thereof to communication partners which would possibly warrant response training or prompting. Additionally, maintenance data should have been extended for additional weeks and more training should occur if positioning is not maintained by the staff. Also, no participant training was given regarding how to socialize when positioned in proximity to one another and should be included in future studies. This study was designed to record initial communicative behaviors after social positioning without specific communication instruction. Finally, SGDs, SGD messages, and partners were not always consistent throughout the study. Novelty could have played a role in increased or decreased behaviors at any point. This created confounding variables and should be controlled in future studies.

Future Research

Further research into positioning for social interaction among students with SMD-CCN is needed to confirm these findings and extend its external validity as future research seems promising and necessary given the results of this study. In addition to the suggestions made above, further research on positioning for social interaction should occur (a) at different times of the day, (b) with small groups, (c) with adults with SMD-CCN, (d) with individuals in their wheelchairs, or (e) in different settings (e.g., schools, day programs, and group homes). A study of how people with disabilities socialize with peers without disabilities following opportunities to socialize with peers with disabilities could be very interesting too.

Practical Implications

The data presented provide preliminary evidence that the combination of social positioning (with the availability of SGDs) can increase the amount of interaction (eye gaze) between children with severe communication impairment. The best practice evaluated for this study was based on the literature available for positioning students with SMD in the classroom (see Table 4 for best practices for positioning students for peer communication). Given this preliminary evidence and the limited research on this topic, teachers and staff should be trained to assist students with SMD-CCN to communicate with each other.

Table 4. Best Practices for Positioning Students with Severe and Multiple Disabilities for Peer Communication

<ul style="list-style-type: none"> • Teach communication in settings where it would occur naturally and be meaningful through functional activities (Bailey & Murray-Branch, 1993). This may involve arranging the environment to maximize peer interaction by changing the space available, toys offered, or the children in the group (Arthur, et al., 1999).
<ul style="list-style-type: none"> • Teachers, parents, paraprofessionals, assistants, etc. should teach communication collaboratively (Bailey

& Murray-Branch, 1993) at different points throughout the day (Snell, 1988) using methods such as “modeling, prompting, and reinforcement” (Arthur, et al., 1999, p. 376) or “incidental teaching, mand models, and time delays” and “interrupted sequence training” (Snell, 1988, p. 307) as these have been proven methods for teaching students with disabilities.
<ul style="list-style-type: none"> • Provide “structure and routine” when teaching verbal and nonverbal behaviors as “populations with severe multiple disabilities benefit” from these things. With structures and routines, students will start to understand that communication requires cooperation; they will be able to anticipate activities, initiate communication, and protest changes to the routine (Bailey & Murray-Branch, 1993, p. 40).
<ul style="list-style-type: none"> • Make adaptations for skills to keep students from remaining dependent (Snell, 1988). For example, use AAC instead of requiring students to answer yes/no questions in physical ways.
<ul style="list-style-type: none"> • Use positive feedback to teach and maintain social skills (Miller, Lane, & Wehby, 2005).
<ul style="list-style-type: none"> • Nurses can guide staff members on positioning (Madden & Parkes, 2010) especially during feeding times where other therapists (i.e. speech pathologists and physical therapists) may be able to guide positioning during other activities (Costigan & Light, 2011; McEwen & Lloyd, 1990).
<ul style="list-style-type: none"> • Staff members should keep students close to each other especially during work time (Causton-Theoharis & Malmgren 2005a), take care not to become a physical barrier to communication between peers with disabilities (Causton-Theoharis & Malmgren, 2005b), and should try to fade the assistance they are giving (Causton-Theoharis, 2009).
<ul style="list-style-type: none"> • Communication partners should face one another and give extra time for responses (Douglas et al., 2012).
<ul style="list-style-type: none"> • Stay in proximity to each other during communication (Arthur-Kelly et al., 2007; Chung et al., 2012) or times when communication is possible.
<ul style="list-style-type: none"> • Keep individuals within reach of their AAC devices (Chung et al., 2012).
<ul style="list-style-type: none"> • Communication partners should face one another and give extra time for responses (Douglas et al., 2012).

Note. A list of best practices to be used when positioning individuals with severe and multiple disabilities during out-of-wheelchair time for maximum communication.

According to Causton-Theoharis and Malmgren (2005a), training was the most effective way to teach staff to encourage communication and socialization. Training is essential for teachers and staff of students with SMD-CCN as the peer partners are often fully dependent on the staff for social positioning. Teachers and staff who are trained to properly position and provide SGDs can begin to facilitate interactions among peers with disabilities. This study is an important addition to the literature because it specifically details how educators can increase peer communication and socialization for students with SMD-CCN to promote friendships and quality of life. It further extends the literature on how students with SMD-CCN can and will communicate with their peers with disabilities when provided with the opportunity. While there were limitations of this study, the positioning of students as described above created opportunities for communication with peers that were previously unavailable. This positioning further changes the perception of whom communication partners can be as staff members were no longer the only possible communication partners at times when individuals were out of their wheelchairs.

Compliance with Ethical Standards

Ethical approval: All procedures performed in studies involving human participants 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 was obtained from all individual participants’ guardians included in the study and assent was obtained from all individual participants included in the study.

Conflicts of interest: The authors declare that they have no conflicts of interest.

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End Notes

- ¹ BIGmack is a product of AbleNet, Inc. of Roseville, MN.
- ² LITTLEmack is a product of AbleNet, Inc. of Roseville, MN.
- ³ LITTLE Step-by-Step is a product of AbleNet, Inc. of Roseville, MN.
- ⁴ Twin Talk is a product of Enabling Devices of Hawthorne, NY.
- ⁵ Talkable III a product of Enabling Devices of Hawthorne, NY.
- ⁶ Tumbleforms2 is a product of Patterson Medical of Warrenville, IL.
- ⁷ Twitch Switch is a product of Enabling Devices of Hawthorne, NY.
- ⁸ ECO is a product of Prentke Romich of Wooster, OH.
- ⁹ ECO point is a product of Prentke Romich of Wooster, OH.
- ¹⁰ Canon Powershot G12 10.0 MP Digital Camera is a product of Canon, Inc. of Tokyo, Japan.
- ¹¹ Sony Cyber-shot DSC-T5 Digital Camera is a product of Sony Corporation of NY, NY.

Authors' Note

The research was conducted as a pilot study prior to a doctoral student's dissertation. Correspondence can be directed to Dr. Dena R. Bonnike at dr.bonnike16@outlook.com.

The Problem of Disproportional Representation of Students from Minority Races in Special Education

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Abstract

The purpose of this study was to investigate the effects of integrating culturally responsive instruction (CRI) into a course hosted by the school of education at a higher education institution. The study participants were pre-service teachers who completed a pre-course survey and a post-course survey designed to discern their views on the factors that contribute to the disproportionality problem in schools. The participants were also asked to write and subsequently alter lesson plans to reflect their knowledge of CRI. The discussions and activities included in this project aimed to develop responsive instructional approaches with the ability to reshape the curriculum. The positive influence of this project is clear based on the participants' responses and the quality of their altered lesson plans. The results based on qualitative and quantitative methods are discussed.

Keywords: *Diversity, disproportionality, culturally responsive curriculum, pre-service teachers, teachers' preparation programs.*

Introduction

A problem that mandates serious remediation is the disproportional representation of minority groups in special education. The issue of overrepresentation is more pronounced in the diagnoses of high-incidence disabilities (e.g., specific learning disabilities, emotional and behavioral disorders, mild cognitive disabilities) than in the diagnoses of low-incidence disabilities (e.g., severe cognitive disabilities, deaf/blindness, cerebral palsy) (Arnold & Lassmann, 2003). The diagnosis process for these two groups of disabilities differs significantly (Reschley, 1988). The diagnoses of high-incidence disabilities, such as emotional disorders and specific learning disabilities, include “judgment categories” that are based on professional judgment (MacMillan & Reschley, 1998). In other words, the diagnoses of high-incidence disabilities are based on a social and behavioral model, whereas the diagnoses of low-incidence disabilities are based on a medical model (Vallas, 2009). The very nature of a high-incidence disability that allows students to overcome the associated conditions can also facilitate incorrect diagnoses and subsequent placement in special education (Eads, Arnold, & Tyler, 1995).

Many of the suggested factors that contribute to these disparities are complex, as the factors are interrelated and interact with one another, making it increasingly complicated to mitigate this phenomenon. Most researchers who investigate the leading factors contributing to the disproportionality problem appear to agree that the majority of these factors can be classified according to the following three major variables: social demographic variables, general education and related resource inequity variables, and variables related to the special education process (Skiba et al., 2006).

An examination of the social demographic factors associated with the disproportionality problem reveals that minority students are more likely to be enrolled in lower-track courses offered by schools with weaker academic standards because these students generally attend low-performing schools (Skiba et al., 2006). A large resource inequity among different races and classes is also documented (Togut, 2011), with the devastating consequences of poverty causing children to be ill prepared and lacking in school readiness (Skiba et al., 2006).

Cultural reproduction theory was further developed to explain the reproduction of class-based differences. The theory posits that class and racial inequities are reproduced through reoccurring decisions and behaviors that can be avoided if the relevant decision makers have the necessary knowledge and awareness (Skiba, Bush, & Knesting 2002; Stanton-Salazar, 1997)

General education and related factors contribute significantly to this problem, as inconsistent practices have been found in relation to the pre-referral process (Arnold & Lassmann, 2003). An African-American male who is behaving according to the norms of his local Black/African American community may be perceived by teachers who are unfamiliar with these norms as disruptive and threatening. These factors and others may explain why teachers refer minority students to special education programs more frequently than non-minority students for behavioral rather than academic problems (Gottlieb, Gottlieb & Trongue, 1991).

The assessment and evaluation process may be perceived as subjective, as it may be influenced by school politics and the perspectives of referring teachers (Harry, Klingner, Sturges, & Moore, 2002). According to the critiques identified by teachers, the time spent in the process of referral, assessment, and decision making is longer than the time needed to understand a student's areas of concerns (Skiba, Bush, & Knesting 2002). High-stakes testing is correlated with dropping out of school and retention rates for all students, but this correlation is stronger for poor and minority students. The typical students retained include poor males, Hispanic students,

and Black/African American students (Togut, 2004). Many teachers perceive high-stakes testing as creating pressure on both teachers and parents. Referrals for special education evaluations provide adequate justification for students' low performance; hence, the evaluations and accountability of teachers and schools are likely to be relatively unaffected by this low performance (Skiba, Bush, & Knesting 2002).

The Size of the Problem

According to the U.S. Department of Education (USDE) 30th Annual Report to Congress on the implementation of the Individuals with Disabilities Education Act (IDEA) (2008), the "Risk Index" is calculated by dividing the number of children/students in a specific age group served by the IDEA according to racial/ethnic groups by the estimated resident population of the same age group according to racial/ethnic groups in the U.S. and then multiplying the results by 100. The Risk Index for All Other Racial/Ethnic Groups Combined is calculated by dividing the number of children/students in a specific age group served by the IDEA across all other racial/ethnic groups by the estimated number of U.S. residents of the same age group across all other racial/ethnic groups and then multiplying the results by 100. The term "all groups" includes the following: American Indian/Alaska Native, Asian/Pacific Islander, black (not Hispanic), Hispanic, and white (not Hispanic). Finally, a "Risk Ratio" is calculated by dividing the Risk Index for each racial/ethnic group by the Risk Index for all other racial/ethnic groups combined. If, for example, a certain racial/ethnic group has a Risk Ratio equal to two with regard to receiving an intervention, then that group's likelihood of receiving that intervention is twice as large as the likelihood for all other racial/ethnic groups combined (United States Department of Education [USDE], 2008). For the purpose of this review, we use the Risk Ratio to discuss the size of the problem.

The most recently reviewed Report to Congress on the Implementation of the IDEA (USDE, 2013) reported that infants and toddlers (from birth to age two) who were of American Indian/Alaska Native, Asian, and Hispanic ethnicities had Risk Ratios of .9, .8, and .9, respectively; thus, they were slightly less likely than toddlers and infants of all other racial/ethnic groups combined to be served by IDEA. Native Hawaiian/other Pacific Islander and white children had Risk Ratios of 1.1 and 1.2, respectively, indicating that these infants and toddlers were slightly more likely than all other racial/ethnic groups combined to be served by IDEA. Black/African-American children ages 0-2 had a Risk Ratio of 1.0, which indicates that they were as likely as children in all other racial/ethnic groups combined to be served by IDEA (United States Department of Education (USDE), 2013).

Children aged three through five who were of American Indian/Alaska Native, Native Hawaiian/other Pacific Islander, or white descent had Risk Ratios of 1.4, 1.5, and 1.2, respectively; hence, these children were more likely to be served by IDEA than children of other groups. Asian and Hispanic children had Risk Ratios of .7 and .8, respectively, indicating that these children were less likely to be served by IDEA than other groups of children. Black/African-American children aged three through five had a Risk Ratio of 1; hence, they were as likely as children across all other racial/ethnic groups combined to be served by IDEA (United States Department of Education (USDE), 2013).

American Indian/Alaska Native, Black/African-American, and Native Hawaiian/other Pacific Islander students aged 6 through 21 years were more likely to be served by IDEA than students

in all other racial/ethnic groups combined, with Risk Ratios of 1.6, 1.4, and 1.6, respectively. Asian, Hispanic, and white students aged 6 through 21 years were less likely to be served by IDEA, with Risk Ratios of .5, .9, and .9, respectively (United States Department of Education (USDE), 2013).

An examination of the Risk Ratios of students aged 6-21 years served by IDEA reveals that the Risk Ratios for younger ages are smaller than those for older ages, except for students of Asian and white backgrounds. As students age, the gap between their abilities and those of their peers increases. According to Graph 1, the number of Indian/Alaskan Native, Black/African-American, and Native Hawaiian/Pacific Islander students served by IDEA increases along with the students' ages.

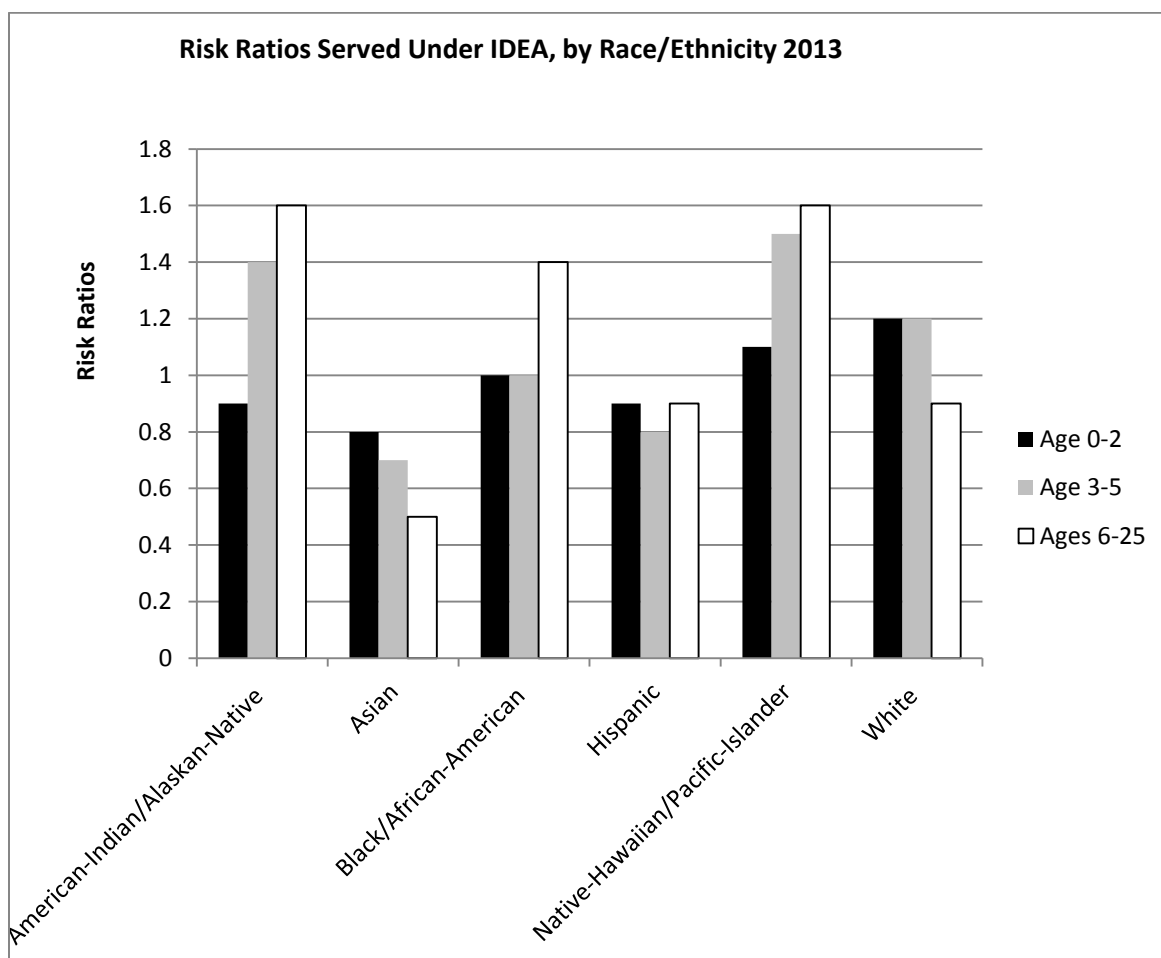


Figure 1. Risk Ratios for Groups of Students between 0- and 25-Years-Old Served by IDEA in 2013

Note: The graph was based on data retrieved from the 35th Annual Report to Congress regarding the Implementation of IDEA, 2013, U.S. Department of Education.

The percentages of students diagnosed with different disabilities vary across ethnicity groups. Specific learning disabilities are the most prevalent within each group of students from 6 to 21

years old. The percentages of students aged 6- to 21 years diagnosed with emotional and behavioral disorders according to racial/ethnic groups were as follows: Black/African-American (9.1%), American Indian/Alaskan Native (6.7%), white (6.5%), Native Hawaiian/other Pacific Islander (5.5%), Hispanic (4%), and Asian (2.5%) (United States Department of Education [USDE], 2013). Thus, the data suggest that students from specific racial/ethnic backgrounds have more referrals for emotional disorders, including behavioral challenges, compared with other groups (see Graph 1).

Culturally Responsive Teaching

Gay (2000) described culturally responsive teaching (CRT) as a validating, multidimensional method that integrates students' knowledge and culture into varied learning experiences. This approach is comprehensive in that it addresses the child as a whole. CRT can also be described as transformative, liberating, and empowering (Gay 2000). One of the most influential factors in the process of teaching students from diverse cultural backgrounds and/or lower socioeconomic levels is the aim to connect school and classroom experiences in a culturally relevant manner (Schmidt, 2005). Ensuring connections among home, school, and community environments promotes literacy and academic achievement (McCaleb, 1994; Schmidt, 2005). Because many students from diverse backgrounds perceive discontinuity between their lives at school and their home life, it is imperative for teachers and schools to connect with students and their families. This connection promotes the relevance of and positive attitudes toward school and consequently contributes to narrowing the academic gap (Edwards, 2004; Edwards, Pleasants, & Franklin, 1999; Ladson-Billings, 1995). Efforts to create this connection between home and school should not merely occur spontaneously; rather, it should be embedded in the lesson plans that teachers implement on a daily basis. Teachers should incorporate students' home-based literacies, experiences, talents, and resources into the daily teaching and learning experiences in the classroom (Edwards, 2004).

The purpose of the current study was to promote participants' knowledge by developing culturally responsive standards-based lesson plans. In a previous research review, Schmidt (2005) identified seven characteristics of culturally responsive instruction (CRI): high expectations, building relationships with families and communities, reshaping the curriculum, active teaching, teachers as facilitators, student participation, and grouping (Schmidt, 2005). The process and results of integrating culturally responsive standards-based curriculum/teaching into a required course in the School of Education at a higher education institution will be described below. Another purpose of the current study was to investigate the effect of this integration on participants' knowledge and perspective on issues related to diversity. According to Groski's analysis of multicultural teacher education (MTE) (2008), the structure of the discussions and activities used in this integration process can be described as liberal teaching with multicultural competence.

Methodology

Participants

Forty-seven participants with different majors in the School of Education were enrolled in the "Inclusion of Students with Exceptional Needs" course as part of their required professional studies (see Tables 1 and 2). Enrolled participants met with their instructor in class twice a week

for 13 weeks. One major goal of this course was to discuss the inclusion of students with exceptional educational needs in regular classrooms, in addition to discussing the laws, definitions, characteristics, adaptations, strategies and transitional services that pertain to persons with special needs. This course was used to integrate diversity and CRT.

Table1. Participants' Major Fields of Study

	Technology Education and Applied Sciences				Humanities and Art Education		Humanities and Pupil Service				
Participants' Programs/Majors	Technology Education	Marketing and Business Education	Math Education	Science Education	Family/Consumer Science Education	Art Education	Special Education	Vocational Rehabilitation	Early Childhood Education	Pre-Grad School	Total
	14	5	1	1	4	9	6	3	2	2	47

Table 2. Participants' Level of Study

	Freshman	Junior	Sophomore	Senior	Pre-Grad	Total
Participants' Level	4	6	15	20	2	47

Procedures

During the first week of this project and at regular class meetings, the participants were asked to complete a pre-course survey that measured their awareness of and ability to articulate the challenges of teaching students from diverse backgrounds (Appendix A). In their prospective programs, the participants were asked to write lesson plans on a topic related to their major field of study. During the following six weeks, they were encouraged to explore their own backgrounds by candidly discussing their cultural situations while growing up, including where they lived, their socioeconomic status, their ethnic or cultural background, and their spiritual traditions. A large proportion of the discussion that followed included a review of the research related to the disproportional representation of racial groups and the different factors that may have contributed to this disproportionality, including social and demographic variables, the inequity of general education and related resources, and the special education process. Small-group and whole-group discussions were encouraged to help students engage in critical, reflective, and analytical thinking regarding the possible factors contributing to these disparities. The participants were provided with the opportunity to compare their analyses of the disproportionality problem with existing analyses in the literature.

The next two weeks included discussions regarding the concept of CRT and its components: high expectations, cultural sensitivity-resaped curriculum, active teaching methods, teachers as facilitators, partial student control, group-based instruction, and positive relationships with families and communities (Gay, 2010; Schmidt, 2005). The participants then analyzed and discussed the lesson plans (Schmidt, 2005) that were written and implemented according to the practical guidelines from the CRT perspective. Near the end of the semester, the participants modified the lesson plans that they had written at the beginning of the semester to reflect their new knowledge of CRT. The survey that was administered at the beginning of the semester was again provided at the end of the semester (Appendix A).

Results

Quantitative

The participants' majors were categorized into three groups to allow for referential statistical analyses: (a) a Technology Education and Applied Sciences group (i.e., math education, science education, and marketing and business science education), (b) a Humanities group (i.e., family and consumer science education and art education), and (C) a Humanities and Pupil Services group (i.e., special education, early childhood education, vocational rehabilitation, and school counseling). This study attempted to answer the following questions:

- Are there significant differences among participants with different majors in their responses to the pre-course survey and post-course survey statement "Schools and teachers encounter challenges when working with students from diverse backgrounds (e.g., African-American, Native American, Hmong, Hispanic)"? The independent variable was the different majors. The dependent variable was the participants' self-ratings using a Likert scale of 1-5, with 5 indicating strong disagreement. The ANOVA result was not significant, $F(2, 44)=.154, p=.86$.
- Are there significant differences among participants with different majors in their responses to the pre-course survey and post-course survey statement "I have the necessary tools to write culturally responsive lesson plans"? The independent variable was the different majors. The dependent variable was the participants' self-ratings using a Likert scale of 1-5, with 5 indicating strong disagreement. The ANOVA result was significant, $F(2, 44)=6.59, p=.003$. A post hoc test was conducted to evaluate the pairwise differences between the means. The results revealed significant differences in the means between the Humanities and Pupil Services group and the Humanities and Art Education and Technology Education and Applied Sciences groups. The Humanities and Pupil Services group rated themselves more positively in possessing the necessary tools to write culturally responsive lesson plans ($M=1.65, SD=.47$) compared with the self-ratings of the Humanities and Art Education group ($M=2.35, SD=.625$) and the Technology Education and Applied Sciences group ($M=2.31, SD=.58$).
- Are there significant differences among participants from different majors in response to the pre-course survey and post-course survey statement "It is my responsibility as a teacher to use culturally responsive instruction"? The independent variable was the different majors. The dependent variable was the participants' self-ratings using a Likert scale of 1-5, with 5 indicating strong disagreement. The ANOVA result was significant, $F(2, 44)=4.52, p=.016$. However, post hoc analyses were not possible because one of the

subgroups had only 2 participants. Therefore, the direction of the level of significance is unclear, although an examination of the means for each group reveals that the Humanities and Pupil Services group agreed more with the statement ($M=1.12$, $SD=1.22$) than did the Humanities and Art Education group ($M=1.5$, $SD=.50$) and the Technology Education and Applied Sciences group ($M=1.52$, $SD=.43$).

Qualitative

Description of the problem and contributing factors. The participants were asked to describe some of the challenges that schools and teachers encounter when teaching students from diverse backgrounds. In general, the participants were more articulate when describing the factors causing these challenges or leading to the disproportionality problem than they were when providing descriptions of these challenges. Therefore, the suggested factors were compared to the factors that previous studies have identified as contributing to the disproportionality problem.

Resource inequity and other consequences related to poverty have been documented in previous literature as social and demographic factors that contribute greatly to the disproportionality problem. In the current study, the social factors associated with poverty and its related manifestations were identified by the participants as factors resulting in disproportionality less often than factors related to the educational system. However, the participants implicitly suggested that poverty was a factor contributing to the disproportionality problem, as their implicit responses mentioned a lack of family involvement, student anger resulting from their life conditions, and family and health issues. Poverty and its related manifestations were discussed more frequently in the pre-course survey than in the post-course survey. The latter included more specific language related to teachers and schools as factors contributing to the disproportionality problem.

Inconsistent practices related to the pre-referral of minority students to special education evaluation, particularly for disciplinary problems, is a well-documented factor associated with the overrepresentation of minority students in special education (Gottlieb, Gottlieb, & Trongue, 1991). In the current study, the term “discrimination” was evident in the participants’ responses when referring to teachers who are biased toward students from minority backgrounds. Other responses reflected a more implicit view of teachers, schools, and/or the system as discriminating against those students. In both the pre-course survey and the post-course survey, the participants did not distinguish between the practices of special education teachers and general education teachers, which could explain the disproportionality problem. Examples of such responses include the following: discriminated against students, being prejudiced, mistaking a second language for a disability, not accommodating English language learners (ELLs), not relating to students’ cultures, excluding students’ cultures from the curriculum, using a curriculum based on a single cultural perspective, using a curriculum that may be offensive to some cultures, insufficient efforts by schools to communicate with students and their families, parents feeling unwelcome in the school, a number of behavioral patterns related to a particular culture being mistaken for a disability, self-fulfilling prophecies, and teachers blaming students’ backgrounds for their academic and behavioral struggles.

Although most responses indicated a mishandling of cultural differences by teachers or the school system, some responses indicated that students’ cultural differences did not meet the

schools' standards and codes of conduct, which suggests that the responsibilities lies solely with students and their cultures. Responses that arose in the pre-course survey but not in the post-course survey included the following: students are offended easily based on values that are embedded in their culture; many minority groups are poor, which results in problems; education is not important in some cultures; and hygiene is not important in some cultures.

Direct definition of CRI. The participants were asked to define CRI and provide examples. Their responses were compared with how CRI has been identified in the literature: high expectations, cultural sensitivity-resaped curriculum, active teaching methods, teachers as facilitators, partial student control, group-based instruction, and positive relationships with families and communities (Gay, 2010). The most frequently identified component in both the pre-course survey and the post-course survey was reshaping the curriculum. The components that occurred only in the post-course survey were high expectations, active teaching methods, partial student control, and teachers as facilitators. Another difference between the pre-course survey and the post-course survey was the perception of accommodations as being instructional: curricular accommodations were discussed in the post-course survey, whereas only environmental and social accommodations were discussed in the pre-course survey. The number of examples of instructional and curricular accommodations that participants provided was nearly double in the post-course survey compared with the pre-course survey.

Indirect definition integrating CRI into lesson plans. The participants were asked to develop lesson plans that they believed to be culturally responsive prior to their discussions of the disproportionality problem and the components of CRI (pre-discussion lesson plans). The participants were subsequently asked to revise these lesson plans to reflect the CRI components (post-discussion lesson plans). The "pre-discussion lesson plans" lacked procedures or activities directed toward creating positive family and community communication, teaching practices that reflected high expectations, teachers serving as facilitators, and students having partial control over the lesson. The components that were identified most often in the "post-discussion lesson plans" were group-based instruction and active teaching methods. The components that were integrated into post-discussion lesson plans the least often were high expectations, teachers as facilitators, and students' partial control over the lesson.

Discussion and Conclusion

Quantitative: How Familiar Participants Are with CRI

The participants in the Humanities and Pupil Services group (i.e., special education, early childhood education, and vocational rehabilitation) rated themselves more positively in having the necessary tools to write culturally responsive lesson plans compared with the ratings of the other two groups. This result may have arisen because the participants in those majors are required to have more practicum experience within their programs than the participants with other majors. Moreover, the nature of their majors is closely related to working with students with special needs who may require accommodations and modifications to their academic, behavioral, vocational, and/or social learning experiences.

To further our understanding of this result, participants' confidence about having the necessary tools to write culturally responsive lesson plans, as measured by the pre-course survey was examined rather than focusing on the differences between the pre-course survey and post-course survey. An ANOVA was conducted to examine the responses to the following statement

on the pre-course survey: “I have the necessary tools to write culturally responsive lesson plans.” The ANOVA result was significant, $F(2,43)=7.99, p=.001$. The participants from the Humanities and Art Education group were the most confident when responding to this statement ($M=2.00, SD=.71$), followed by those from the Humanities and Pupil Services group ($M=2.83, SD=.58$) and the Technology Education and Applied Sciences group ($M=2.9, SD=.70$). Therefore, participants from all majors became more confident in their agreement with the above statement, but participants from the Humanities and Art Education group began the course with higher confidence levels compared with the other two groups of majors. This finding suggests that the participants in the Humanities and Pupil Services group experienced the greatest gains. However, the question arises as to why the participants from the Humanities and Art Education group began the course with higher confidence levels. One possibility is that some variables were overlooked in the current study; these variables could include taking other courses related to multiculturalism and/or the social and economic narratives in which those participants have adopted.

Qualitative: Participants’ Views of the Factors Contributing to the Disproportionality Problem

The course included two types of discussions: whole-group and small-group discussions. The participants shared information regarding their own cultures and backgrounds in small groups. During the course of the semester, the participants discussed factors related to the disproportionality problem. Based solely on frequency measures, the participants were more reserved at the beginning of the semester and were less likely to raise their hands and voice their opinions on poverty, race, school systems, teaching practices, and cultural values. The participants who did raise their hands to share opinions during whole-group discussions at the beginning of the semester continued to do so throughout the duration of the course. The frequency of participation increased as more students chose to participate in the whole-group discussions. Notably, the instructor needed to avoid taking sides during the discussions and instead needed to inquire about opposing perspectives to gain insight. Furthermore, the instructor was a person who was not born and raised in the U.S.; hence, it was important that she remain sensitive to and respectful of the evolution of social and historical contexts that she had not witnessed herself but had learned about subsequently.

In the pre-course survey, the number of responses connecting factors of poverty and its manifestations to the disproportionality problem was greater than the number of responses noting factors related to the educational system. However, in the post-course survey responses, the participants discussed factors related to the educational system as causing the disproportionality problem. In fact, responses of this nature doubled in the post-course survey relative to the pre-course survey. This result is important, because it suggests a shift in perspective from uncontrollable factors (e.g., “Students’ cultures and socioeconomic statuses are out of my control”) to controllable factors (e.g., “I am a teacher, and I am part of the educational system”). Understanding that some factors within the educational system contribute to the disproportionality problem increased the participants’ sense of responsibility and ownership of the problem.

Another gain that was observed in the post-course survey was the increase in the use of academic language. The participants avoided describing the problem using colloquial language and preferred to use expressions that are frequently used in the literature, including terms such as

“different learning styles,” “differentiating instruction,” “inclusion,” “English language learners,” and “universal design for learning.” Similarly, in the post-course survey, the participants avoided expressions such as “some cultures don’t strongly value education” and “some cultures don’t care about hygiene.” Notably, the instructor did not discuss those pre-course survey expressions with the participants; thus, this finding indicates that the participants decided to change on their own rather than being explicitly instructed to change.

Qualitative: CRI in Lesson Plans

In the post-course survey, the participants were more articulate when providing specific examples of CRI. An art education major suggested introducing Japanese art in a lesson. Another lesson proposed by an art education major included active teaching methods, such as allowing student input when using coil techniques. Furthermore, a family and consumer science major included Native American recipes in a lesson plan instructing on a healthy diet. A technology education major suggested taking a field trip to observe housing designs in the community prior to discussing drafting and graphing. Moreover, participants in the marketing and business education major used mnemonics from Native American culture to help in teach keyboarding techniques. Notably, the few accommodations that were suggested in the “pre-discussion lesson plan” were often environmental changes, such as hanging posters on walls referring to different cultures or inviting students to wear traditional costumes. In the “post-discussion lesson plan,” however, such responses arose less frequently, and the dominant nature of the suggested accommodations resembled instructional and curricular accommodations.

The component of high expectations was not evident in the post-discussion lesson plans. The participants discussed their integration of this component by describing the state and common core standards corresponding to their lesson plans. The inability to articulate how a teacher can demonstrate high expectations may be explained by the lack of implementation of these lessons. The participants’ understanding of the components of students’ partial control of the lesson and teachers as facilitators remains unclear. Because the participants were pre-service teachers who lacked consistent experience teaching grade school students, they had not yet developed strategies that would allow their students to facilitate their own learning.

Using Groski's analysis of MTE (2008), the current project can be described as liberal teaching with multicultural competence. Although some activities included some characteristics of the programs analyzed by Groski (2008) as being conservative and/or critical, the majority of the discussions and activities were focused on culturally responsive curriculum and differentiating instruction. The participants in this study appeared to begin the class with positive attitudes, as shown in their pre-course survey responses; hence, the change observed in their responses cannot be considered revolutionary. However, this study significantly affected on the degree to which the participants were able to articulate challenges and successes related to diversity and to create CRI-based lesson plans. One limitation of the current study is related to its sample size. Furthermore, this study did not measure the practical effects of the project. Therefore, one recommendation is that CRI-based lesson plans should be implemented in school settings to gain a better understanding of how to better prepare teachers for the increasing diversity of today’s classrooms.

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Appendix A

Pre-Course Survey and Post-Course Survey: *Pre-Service Teachers' Knowledge of CRI and the Disproportionality Problem*

What is culturally responsive instruction?	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Schools/teachers face challenges when working with students from diverse backgrounds (e.g., African Americans, Native Americans, Hmong, Hispanic).					
It is my responsibility as a teacher to use culturally responsive instruction.					
I have the necessary tools to write a culturally responsive lesson plan.					
Describe some of the challenges that schools and/or teachers encounter when interacting with students of diverse backgrounds (e.g., African Americans, Native Americans, Hmong, Hispanic).					
Describe some of the <u>behavioral</u> challenges that teachers encounter when interacting with students from diverse backgrounds (e.g., African Americans, Native Americans, Hmong, Hispanic).					
Provide two examples of culturally responsive teaching instruction.					

The Use of Metacognitive Knowledge and Regulation Strategies of Students with and without Special Learning Difficulties

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Abstract

In the current research, the use of students' metacognitive strategies with and without special learning difficulties was studied as well as any differentiation of this use because of class or gender. The tool which was used was Junior Metacognitive Awareness Inventory, Version B (Jr. MAI) of Sperling et al. (2002) and is based on Brown's theoretical framework and includes the two dimensions of metacognition: "the knowledge of cognition" and "the regulation of cognition". It's the first time that the tool has been used in Greek student population of this age with and without special learning difficulties. Two hundred and forty students (245) participated in this research, 58 students with special learning difficulties and 187 students without special learning difficulties. The students of the two groups of the 5th and 6th grade presented several similarities regarding their preference in the use of the knowledge of cognition. The

differentiation which appears in the rates is mainly quantitative and refers to the frequency of the use of strategies and not qualitative, which indicates that both teams are faced with difficulties because of the regulation of cognition as a cognitive process of superior level. Girls in relation to boys in the total of the sample use more often the strategies of regulation of cognition and not of the knowledge of cognition.

Keywords: *metacognition knowledge, strategies, SLD, MAI Jr*

Introduction

Kuhn and Dean (2004) define metacognition as the awareness and the management of the thoughts of the individual and Swanson (1990) defines as one's ability to understand and monitor one's own learning and how to use a particular learning strategy in problem solving. In broad definition, it concerns "one's knowledge and control of their cognitive system" (Brown, 1987, 66). The term metacognition has been used as the knowledge and regulation of one's cognitive activities in learning processes (Brown, 1978; Flavell, 1979; Schraw & Dennison, 1994; Schraw, 1998). According to Flavell, (1979) and Efkleides (2008; 2011) metacognition refers to the awareness of the necessity of the use of certain strategies such as planning, information management, monitoring, evaluation (Schraw & Dennison, 1994; Pintrich, 1999; Papaleontiou-Louca, 2014). The distinction of metacognition into the metacognitive knowledge, experience, skill and the self-regulation and the methodological differentiation which it entails seems to be confirmed in several studies in different fields of knowledge (Efklides & Misailidi, 2010; Koulianou & Samartzi, 2012).

In contrast to the tools of measurement of metacognition used to adult students, there are very few self-reference questionnaires for the measurement of metacognition in reading to younger students. The review of Koulianou & Samartzi (2012), revealed: a) absence of tools of the metacognitive knowledge to children aged 7-11, b) absence of studies of metacognition and teachers' self-regulation c) very few studies on metacognition in relation to learning difficulties. Gascoine, Higgins and Wall's, (2016) presents the results of a systematic review of methods and tools that have been used to measure metacognition in children aged 4-16 years, at over a 20-year period (1992–2012). The final number of methods and tools for metacognitive assessment included in the analysis was only 80. The key findings of this review include self-report measures (including questionnaires, surveys and tests) comprise 61% of the included tools, observational methods that do not rely on prompting to 'think aloud' (think aloud protocols) have only been used with students aged 9 years and under.

Although the examination of metacognition continues even today to be a promising object that attracts the attention of the scientific community, we find that there is a limited range of tools for evaluation of metacognitive awareness both generally, or specifically in reading and even for younger ages. Aim of this study is the use of a tool that can measure both elements of knowledge of cognition and those of regulation of cognition (Schraw & Dennison, 1994) for students with and without learning difficulties. Secondly, it is the only self-report tool that can be achieved by measuring metacognitive deficiencies and intervention to develop metacognitive strategies (Sperling, Howard, Miller & Murphy, 2002).

The Theory of deficient skills and the metacognitive approach

In the past Learning Difficulties had been defined as deficits in basic cognitive processes,

indispensable for student involvement in academic works (Lerner, 2003; Wong, 1985). According to the theoretical framework of cognitive deficits very soon students with learning difficulties were considered to be lacking metacognitive thought (Wong, 1985). The turn to the study of metacognition and the disproof of the assumptions of the Theory of Deficient Skills by Health professionals as well as through the survey data, which did not confirm the deficient performance skills, marked out metacognition into a significant factor in the attempt to understand learning difficulties.

Turning to metacognitive consideration emphasis is placed on the performing child and Brown introduces the notions of “Knowledge of Cognition” and “Regulation of Cognition”. Metacognition is defined by the terms of intentional and conscious control of the cognitive actions by the individuals themselves (Brown, 1978; Baker & Brown, 1984; Rouet & Eme, 2002).

Aydin & Ubuz (2010) in their study support the theoretical distinction of the two terms, metacognitive knowledge (Flavell, 1979) and metacognitive regulation (Brown, 1978). Metacognitive knowledge refers to acquired knowledge in terms of person, task and strategy (Flavell, 1979) while Brown (1978) classifies it into subcomponents as declarative, conditional and procedural knowledge. Flavell (1979) proposes a unified theory of metacognitive regulation referred to as conscious use of strategies of planning, monitoring, and controlling. On the contrary, Brown, (1978) presupposes the existence of planning, selecting, monitoring, evaluating and debugging processes without the necessity of awareness. Whereas both researchers regarded regulatory processes as strategic decisions, these decisions which individuals engage during the execution task are conscious for Flavell but unconscious for Brown.

The contribution of the study of the Metacognition will be judged crucial to the three areas of the Special Learning difficulties: 1. Metacognitive skills constitute the “pedestal” of the efficient study and reading (Brown, 1987). 2. Metacognition contributes to the understanding of the weak effort of the pupils with S.L.D. to conserve and generalize already taught knowledge, skills and strategies (Wong, 1986). 3. The crucial and central role of the phonological (metalinguistic) awareness as knowledge of the phonemes and the handling (control-regulation) as metacognitive skill is pointed out (Wong, 1986).

The new emerging metacognition models went on to the co-examination of the motivation factors and of metacognition (Bandura, 1993; Borkowski, Milstead & Hale, 1988). These models offer explanations as to how students’ motives finally shape their strategic activities. Additionally, the coordination of the students’ motives, knowledge and skills allows the recognition of the factors which threaten their successful participation in the cognitive work, as well as the utilization of the strategies of the metacognitive monitoring (Butler, 1998). Students with learning difficulties don’t appear strong motives; they usually adopt passive forms of learning and are characterized by an attitude of “learned helplessness”. These characteristics, which compose a vulnerability of motives for the children with Learning Difficulties, interfere and affect negatively the efficiency of cognitive and metacognitive actions of the students, making it difficult to generalize any results achieved.

Metacognition, metacognitive strategies and reading Comprehension

Up to nowadays Reading continues to be considered as the capstone of the academic work. In the field of reading, the theoretical framework of metacognition and the constructivist notion introduced by it, changes the perception about the way reading comprehension occurs and highlights the valuable role of the metacognitive strategies (Koutsouraki, 2009). In 1984, Baker

& Brown had already pointed out that metacognition is considered constructed course towards certain theories on reading. Reading comprehension becomes now a top-down process which emerges from knowledge organized into shapes. These shapes which contain organized prior knowledge affect the construction of meaning, the comprehension. Therefore, individuals structure their own interpretation about what they read, based on the existing shapes that are their personal prior knowledge (Smith, 2015; Koutsouraki, 2009).

The study of both the experienced and the beginners in various cognitive areas provides rich research data as the new research field of Cognitive Psychology. Very fast the proportion of experienced and beginners and their difference in the frequency of use of strategies was transferred to the field of learning difficulties and especially the reading ones in the form of experts-readers without learning difficulties versus poor readers with special learning difficulties. The research which was carried out according to this reasoning highlighted poor but existing strategies used by the beginners or poor readers. In fact, the use of some strategies was assessed as particularly poor to the experienced, the readers without special learning difficulties (Botsas & Padeliadu, 2003; Padeliadou, Botsas & Sideridis, 2002).

The experts' - novice's context and the use of strategies

The study of experts and novice's in various cognitive areas offers, as a new research field of Cognitive Psychology, rich investigation data. Very soon the proportion of experts – novice's and their difference in the frequency of the use of strategies was transferred to the field of learning disabilities and notably the reading ones in the form of experts – readers without learning disabilities versus poor readers with special learning difficulties. The research which was carried out under this concept revealed poor but also existent strategies used by the beginner or poor readers (Furnes & Norman, 2015; Padeliadou et al, 2002). Indeed, the use of certain strategies was assessed as particularly poor for the experts/readers without learning difficulties (Farahian, 2016; Bergey, Deacon & Parrila, 2015; Botsas & Padeliadu, 2003; Wong, 1994).

The profile of the children with reading difficulties

Furnes & Norman (2015) compared three forms of metacognition in normally developing readers and readers with dyslexia. Pupils with dyslexia showed insight regarding their reading difficulties but less general knowledge of how to approach a reading text. Very often they reported an absence of available reading strategies; however, both teams didn't differ in the use of deep and surface strategies. The writers conclude that the problems of dyslexia are not always connected with the lowest levels of metacognitive knowledge, metacognitive strategies or experiences.

Padeliadu et al (2002), explored the metacognitive skills in reading with the use of a verbal method and specifically with the questionnaire of Miholic to pupils of the last four grades of Elementary School and found that weak reading strategies are also used by children without difficulties in reading, which is probably due to the modern language teaching. The children with difficulties in reading possess metacognitive strategies, which are fewer and weaker than the strategies children of the same age use without having any difficulties in reading. They behave like younger children at the initial stages of reading. They possess few planning strategies of the reading process and they cannot select the proper strategies in order to deploy properly their cognitive skills. They know better strategies of weak and novice reading than strategies of good reading. They are likely to lack sufficient energy to bestow upon reading comprehension and develop metacognition due to time consuming and laborious cognitive effort to decode reading. Even when they possess certain strategies, they do not know when to use them and why in order

to achieve the desired target (the conditional knowledge). However, according to Griffith & Ruan (2005) and Brown, Armbruster & Baker (1986), the knowledge of cognitive processes is developed slowly. They have difficulty examining and evaluating the target of the reading trial or its results. Consequently, when they reach the end of their cognitive effort, they don't know if the results fulfill the necessary requirements, they can't redirect their efforts towards comprehension, when this is not achieved, with negative consequences to the final result. The weaknesses of children with reading difficulties as far as strategies are concerned prevent the evaluation of their cognitive efforts and sketch a passive reader, who is unable to modify its approach.

Metacognitive strategies and students with special learning difficulties

O'Malley and Chamot (1990) defined metacognitive strategies as "higher order executive skills that may entail planning for, monitoring, or evaluating the success of learning activity" (p.44), as any set of actions, plans, tactics, thoughts or behaviors that the learners employ to facilitate the comprehension, storage, retrieval, and use of information.

A common finding in several studies is that poor readers have less comprehension about which reading strategies are more suitable in different reading circumstances (Anderson & Armbruster, 1984). However, findings from the University students' area have shown that students having a history of reading difficulties use strategies to the same or greater extent (Corkett, Parrila & Hein, 2006). Finally, Gersten, Fuchs, Williams, & Baker (2001) in a study – review of several intervention studies, found that reading comprehension can be improved in students with learning difficulties through strategy instruction.

Furthermore, according to Wong (1994), during the teaching of strategies it is important for students with learning difficulties to be taught how to demonstrate awareness during strategy learning and transfer. Absence or inadequate awareness explains the weak transfer to students with SLD. According to Larkin (1989), students with learning difficulties must be taught simultaneously both the transfer of general strategies of knowledge which can be applied to various relevant areas, and the transfer of more specialized strategies applied to only specific knowledge areas.

Table 1. Differentiation between mean values and the existence of specific learning difficulties

	SLD	WLD	T-test
Jr MAI	3,44±0,58	3,78±0,48	$t(243) = 4,45^*$
Knowledge of Cognition	3,59±0,60	3,92±0,51	$t(243) = -4,09^*$
Procedural knowledge	3,02±0,82	3,31±0,87	$t(243) = -2,26^*$
Declarative knowledge	3,88±0,78	4,23±0,60	$t(79,06) = -3,15^*$
Conditional knowledge	3,67±0,79	4,00±0,63	$t(81,65) = -2,89^*$
Regulation of Cognition	3,29±0,69	3,63±0,60	$t(243) = -3,67^*$
Planning	3,56±1,07	4,07±0,85	$t(80,37) = -3,30^*$
Control	3,07±1,01	3,28±0,97	$t(243) = -1,36^*$
Monitoring	3,37±0,84	3,65±0,80	$t(243) = -2,26^*$
Management Information Ability	3,09±0,76	3,52±0,76	$t(243) = -3,74^*$

$p < 0,05$ Note: SLD: Children with special learning difficulties, WLD: Children without special learning difficulties

Metacognitive strategies can be taught to pupils with special learning difficulties (Furnes & Norman, 2015).

Method

The main aim of the present research was the investigation of the learning strategies and the metacognitive profile of the students both with and without learning difficulties. The research questions developed for this purpose, were oriented to: a) What qualitative or quantitative differences are observed between the use of metacognitive strategies of learning of students with or without learning difficulties? b) How is the metacognitive profile of the students with or without learning difficulties shaped through the above use and what differences are presented on the levels of knowledge of the perception and its regulation? c) What is the relation of the factor of sex and class in relation to the metacognitive information of the students with or without learning difficulties?

Participants

Two hundred and fort five pupils studying in Greek Primary Schools in Viotia took part in the research, average age $11,35 \pm 0,61$ years with or without special learning difficulties, formed two study groups; those with already diagnosed special learning difficulties (SLD) and those without special learning difficulties (WLD). In their total 117, (47,8%) were boys and 128 (52,2%) were girls. One hundred and four (42,4%) were five grade pupils and 141 (57,6%) were six graders with Greek as their first language.

The first group included 58 (23,7%) pupils, 27 (46,6%) boys and 31 (53,4%) girls of average age $11,48 \pm 0,62$ years, with already diagnosed special learning difficulties in Centers of Diagnosis, Evaluation and Support (CE.D.E.S.) and their cognitive difficulties were not due to other factors such as mental retardation, sensory impairments, emotional disturbances as well as socio-cultural differences. The difficulties had the students were confirmed by their teachers too. As research data imply, teachers' judgments about their students' performance are typically valid and correlate with the results of standardized performance tests (Martínez, Stecher, & Hilda, Borko, 2009). The second, included 187 pupils (76,3%), formally studying, 90 (48,1%) boys and 97 (51,9%) girls of average age $11,31 \pm 0,61$ years.

Instrument

In order to achieve the goal of the research we used the Greek adaptation of the scale for the metacognitive awareness, Junior Metacognitive Awareness Inventory, Version B (Jr. MAI) of Sperling et al. (2002) recently translated and evaluated for its psychometric qualities on the Greek population. Its construction is based on Brown's theoretical framework (1978), and includes the two dimensions of metacognition; the knowledge of cognition and the regulation of cognition, while it constitutes an evolution of the Metacognitive Awareness Inventory (MAI) of Schraw and Dennison (1994). The dimension for the knowledge of cognition measures the significative, the procedural and the occasional knowledge of the individual and is made up of nine questions. The dimension for the regulation of cognition measures elements such as the ability to manage information, planning, monitoring and control and is made up of nine questions (Sperling et al., 2002). In its total the scale of self-reference consists of 18 elements of self-reference in a five- point graded scale of measurement of Likert type. It was considered

important for its selection the fact that as a questionnaire it can be used easily whereas regarding research it has been proved that it can measure both the elements of the knowledge of cognition and those of the regulation of cognition (Schraw & Dennison, 1994). Additionally, it constitutes a unique tool of self-reference through which the measurement of metacognitive elements of pupils can be achieved and can be used as a tool for the diagnosis of the metacognitive weaknesses and of intervention for the development of metacognitive strategies (Sperling et al., 2002). Regarding the validity and reliability of the tool for this study, there was a successive evaluation of the indicator of internal cohesion Cronbach's α and the validity of notional construction through investigative factorial analysis. The indicator of internal cohesion Cronbach's α for the factors ranged from 0,72 to 0,77 while in its total the scale presented a rate/value equal to 0,80. Finally, satisfactory rates/values for both metacognitive dimensions came up through investigative factorial analysis.

Analyses

In order to explore the questions, teachers participating in an educational program about the development of metacognition in Primary Education were asked to give their pupils Jr. MAI, in the form of electronic questionnaires, after the teachers themselves had been trained to it. After the collection of the questionnaires and their connection to the demographic data of the subjects had been completed, the data were transferred to linear array tables in the statistical package Statistical Package for Social Science (S.P.S.S., Version 20.0) and were quantitatively analyzed. As for the missing values, though few in the total number of the questionnaires, we used the method of their replacement by the average. This particular method was considered more adequate than the alternative methods Listwise, in which each case which has a missing value for any variable is not included in the analysis, and therefore in this way the sample size can be reduced enough and Pairwise, in which each variable which has a missing value is not included in the analysis. Therefore, the method of replacement by the average includes all variables in the analysis in order to perform further tests. For the control of the differences among the subgroups of the sample we used the t-test and for the examination of the correlations, the correlation coefficient of Spearman's rho. As the level of statistical significance (p) 5% was set while findings with p -value <0.05 were considered statistically significant. For the presentation of descriptive characteristics averages (M) and standard deviations (SD) of the replies were used.

Results

Based on independent samples t-test, comparisons between the fifth and sixth grade pupils were evaluated on their performance in Jr MAI and in its subscales, as well as between genders, but also on whether or not they have special learning difficulties. According to the results of the analysis, pupils with special learning difficulties ($M = 3,44$, $SD = 0,58$) mark averages significantly lower $t(243) = 4,45$, $p = ,00$ compared to those who do not belong to this group ($M = 3,78$, $SD = 0,48$) in Jr MAI. Similar differences also emerge in the scale factors regarding knowledge and regulation of cognition. Specifically students without learning difficulties mark a higher average score on the subscale for the knowledge of cognition ($M=3,92$, $SD=0,51$, $t(243)=-4,09$, $p=,00$) and on the subscale for the regulation of cognition ($M=3,63$, $SD=0,48$, $t(243)=-3,67$, $p=,00$), statistically significant. (See Table1.)

Association between SLD and MAI J. strategies

According to the results of the analysis, students with special learning difficulties ($M=3,44$, $SD=0,58$) marked averages significantly lower $t(243)=4,45$, $p=,00$ in relation to those not

belonging to this group ($M=3,78$, $SD= 0,48$) in Jr MAI. Similar differences also emerge in the scale factors regarding knowledge and regulation of cognition. Specifically students without learning difficulties mark a higher average score on the subscale for the knowledge of cognition ($M = 3,92$, $SD = 0,51$, $t(243) = -4,09$, $p=,00$) and on the subscale for the regulation of cognition ($M=3,63$, $SD =0,48$, $t(243)=-3,67$, $p=,00$), statistically significant in comparison to the students with learning difficulties (see: Table 1).

The average measurement value in procedural ($M=3,31$, $SD=0,87$, $t (243)=-2,26$, $p=,024$), declarative ($M=4,23$, $SD=0,60$, $t(79,06)=-3,15$, $p=,002$) and occasional knowledge ($M=4,00$, $SD=0,63$, $t (81,65)=-2,89$, $p=,005$) of students without learning difficulties was significantly higher compared to students with special learning difficulties. The same statistical differences were observed for the planning ($M=4,07$, $SD=0,85$, $t(80,37)=-3,30$, $p=,001$), monitoring ($M=3,65$, $SD=0,80$, $t(243)=-2,26$, $p=,025$) and information management capacity ($M=3,52$, $SD=0,76$, $t(243)=-3,74$, $p=,00$), for students without learning difficulties, as regards the regulation of cognition, although as far as control is concerned ($p=,174>,05$) the difference between the two groups is not statistically significant.

Finally, the superiority of the knowledge of cognition compared to the regulation of cognition is manifested for both groups of students, regarding their metacognitive profile. Specifically, the participants with learning difficulties mark higher average rates in the factor of knowledge of cognition ($M=3,59$, $SD=0,60$, CI: 95%, 2,00 to 4,67) in relation to the regulation of cognition ($M=3,29$, $SD=0,69$, CI: 95%, 1,78 to 4,67). The same is also observed in the group of students without learning difficulties who marked higher average rates in the factor of knowledge of cognition ($M=3,92$, $SD = 0,51$, CI: 95%, 2,78 to 4,89) compared to the regulation of cognition ($M=3,63$, $SD=0,60$, CI: 95%, 2,00 to 4,89).

To complement the above, it is observed that students with special learning difficulties diverge regarding the averages in either the scale or the factors, compared to those who don't have any learning difficulties, regardless of their gender. So the boys without learning difficulties marked an average $3,69\pm0,50$, visibly and statistically higher $t(115)=2,61$, $p=,010$, compared to boys with learning difficulties ($M=3,41$, $SD=0,46$) in Jr MAI.

Furthermore, girls without special learning difficulties ($M=3,85$, $SD=0,45$) had statistically higher average rates than girls who had ($M=3,47$, $SD=0,65$, $t(39,43)=-3,08$, $p=,004$). Correspondingly similar variations between the average rates and the existence of special learning difficulties are presented to both boys and girls, regarding the knowledge factors and the regulation of cognition (see: Table 2).

Table 2. Intergender differences between the average values and the existence of special learning difficulties

s	Gender	SLD	WLD	T-test
Jr MAI	Boys	3,41±0.46	3,69±0,50	$t (115) = 2.61^*$
	Girls	3,47±0.65	3,85±0,45	$t (39,43) = 3.08^*$
Knowledge of cognition	Boys	3,57±0.69	3,88±0,53	$t (115) = -.031^*$
	Girls	3,57±0.69	3,96±0,49	$t (40,14) = -2.89^*$
Regulation of cognition	Boys	3,20±0,62	3,61±0,49	$t (115) = -2.18^*$
	Girls	3,36±0,74	3,75±0,55	$t (41,03) = -3.13^*$

* $p < 0,05$, Note: SLD: Children with special learning difficulties, WLD: Children without special learning difficulties.

Association between Gender and MAI J. strategies

According to the results of the transgender comparison, statistically significant differences between boys and girls with learning difficulties are not presented on both the wide scale ($p = .69$), and in the knowledge factors of cognition ($p = .78$) and the regulation of cognition ($p = .368$), despite a slight preponderance of girls. In contrast, differences occur between boys and girls without learning difficulties. So girls are marking average rates, significantly higher than boys in Jr MAI ($t(185) = -2,36$, $p = .02$) and on the subscale for the regulation of cognition. ($t(185) = -2,86$, $p = .005$). In the subscale for the knowledge of cognition, this difference is not significant ($p = .29$), despite a slight preponderance of girls in procedural ($p = .57$), declarative ($p = .58$) and occasional knowledge ($p = .05$). As far as the regulation of cognition is concerned, the differences are due to the statistically higher rates of girls in the control ($t(185) = -3,78$, $p = .00$) and monitoring ($t(185) = -2,16$, $p = .03$), versus boys, although non-statistical differences with slight predominance of the girls in the planning ($p = .30$) and information management capacity ($p = .43$) are also presented (see: Table 3).

Table 3. Intergender differentiations between the average rates and the existence of special learning difficulties

		Boys	Girls	T-test
Jr MAI	SLD	3,41±0,46	3,47±0,65	$t(56) = -0,40$
	WLD	3,69±0,50	3,85±0,45	$t(185) = -2,36^*$
Knowledge of cognition	SLD	3,57±0,69	3,57±0,69	$t(56) = 0,28$
	WLD	3,88±0,53	3,96±0,49	$t(185) = -1,06$
Procedural knowledge	SLD	2,98±0,75	3,05±0,88	$t(185) = -0,31$
	WLD	3,27±0,94	3,35±0,81	$t(185) = -0,57$
Declarative knowledge	SLD	3,99±0,71	3,78±0,81	$t(56) = -0,99$
	WLD	4,26±0,61	4,21±0,59	$t(185) = -0,56$
Conditional knowledge	SLD	3,66±0,76	3,68±0,82	$t(56) = -0,10$
	WLD	3,90±0,62	4,08±0,64	$t(185) = -1,94$
Regulation of knowledge	SLD	3,20±0,62	3,36±0,74	$t(56) = -0,91$
	WLD	3,61±0,49	3,75±0,55	$t(185) = -2,86^*$
Planning	SLD	3,54±1,03	3,58±1,12	$t(56) = -0,15$
	WLD	4,00±0,92	4,01±0,76	$t(185) = -1,04$
Control	SLD	2,74±0,95	3,35±0,98	$t(56) = -2,40^*$
	WLD	3,00±1,01	3,52±0,86	$t(185) = -3,78^*$
Monitoring	SLD	3,46±0,84	3,30±0,84	$t(56) = -0,70$
	WLD	3,52±0,85	3,77±0,74	$t(185) = -2,16^*$
Management information management	SLD	2,93±0,69	3,24±0,80	$t(56) = -1,59$

Association between grade and MAI J. strategies

The fifth grade students (of average age = $10,75 \pm 0,32$ years) with special learning difficulties and without showing any statistically significant differences in the average rates of

self-reference for both the total of the scale ($p=.48$), and the knowledge factors ($p=.398$) and the regulation of cognition ($p=.67$) (see: Table 4)

Table 4 . Differentiations between the average rates of students with and without special learning difficulties and the grade they studied in

	Grade	SLD	WLD	T-test
Jr MAI	5th	3,53±0,55	3,61±0,49	$t(102) = -0,71$
	6th	3,39±0,58	3,91±0,43	$t(51,13) = -4,95^*$
Knowledge of cognition	5th	3,66±0,54	3,77±0,52	$t(102) = -0,85$
	6th	3,55±0,63	4,04±0,48	$t(51,23) = -4,27^*$
Procedural knowledge	5th	3,00±0,87	3,11±0,83	$t(102) = -0,53$
	6th	3,03±0,80	3,47±0,88	$t(139) = -2,70^*$
Declarative knowledge	5th	3,92±0,74	4,16±0,64	$t(102) = -1,44$
	6th	3,86±0,81	4,29±0,56	$t(49,01) = -3,03^*$
Conditional knowledge	5th	3,80±0,82	3,81±0,68	$t(102) = -0,09$
	6th	3,59±0,77	4,14±0,57	$t(50,66) = -3,96^*$
Regulation of knowledge	5th	3,39±0,69	3,45±0,60	$t(102) = -0,43$
	6th	3,22±0,69	3,77±0,57	$t(139) = -4,69^*$
Planning	5th	3,67±1,30	3,89±0,87	$t(102) = -0,73$
	6th	3,50±0,93	4,21±0,80	$t(139) = -4,45^*$
Control	5th	3,10±1,08	3,19±0,99	$t(102) = -0,40$
	6th	3,05±0,98	3,33±0,96	$t(139) = -1,51$
Monitoring	5th	3,62±0,71	3,41±0,80	$t(102) = -1,07$
	6th	3,23±0,88	3,84±0,76	$t(139) = -3,98^*$
Information management capacity	5th	3,07±0,69	3,36±0,79	$t(102) = -1,50$
	6th	3,11±0,81	3,66±0,71	$t(139) = -3,88^*$
	WLD	3,48±0,79	3,57±0,75	$t(185) = -0,80$

* $p<0,05$ Note: SLD: Children with special learning difficulties, WLD: Children without special learning difficulties

In contrast, regarding the students of the sixth grade (of average age = $11,80\pm0,32$ years), statistically significant differences emerged to the students with special learning difficulties and to those without, with the latter to excel both on the whole scale ($M=3,91$, $SD=0,43$, $t(51,13)=-4,95$, $p=.00$), and in the knowledge factors ($M=4,04$, $SD=0,48$, $t(51,23)=-4,27$, $p=.00$) and the regulation of cognition ($M=3,77$, $SD = 0,57$, $t(139)=-4,69$, $p=.00$) (see: table 4).

According to the results, as they are presented summarized in Table 5, it becomes evident that students with special learning difficulties do not increase the average rates of their answers from the fifth to the sixth grade ($p=.39$ in Jr MAI), as opposed to the students without learning difficulties who present a developmental course in their metacognitive awareness ($t(185)=-4,33$, $p=.00$).

Table 5. Developmental differentiations between the average rates of students with and without learning difficulties and the grade of study

		5 th grade	6 th grade	T-test
Jr MAI	SLD	3,53±0,55	3,39±0,57	$t(56) = -0,88$
	WLD	3,61±0,49	3,91±0,43	$t(185) = -4,33^*$
Knowledge of cognition	SLD	3,66±0,54	3,56±0,63	$t(56) = -0,64$
	WLD	3,77±0,52	4,04±0,48	$t(185) = -3,75^*$
Procedural knowledge	SLD	3,00±0,87	3,03±0,80	$t(56) = -0,12$
	WLD	3,11±0,83	3,47±0,88	$t(185) = -2,88^*$
Declarative knowledge	SLD	3,92±0,74	3,86±0,81	$t(56) = -0,30$
	WLD	4,15±0,64	4,29±0,56	$t(185) = -1,58$
Conditional knowledge	SLD	3,80±0,82	3,59±0,77	$t(56) = -0,95$
	WLD	3,81±0,68	4,14±0,57	$t(185) = -3,61^*$
Regulation of knowledge	SLD	3,39±0,69	3,23±0,69	$t(56) = -0,88$
	WLD	3,46±0,60	3,77±0,57	$t(185) = -3,62^*$
Planning	SLD	3,67±1,30	3,50±0,93	$t(31,810) = -0,52$
	WLD	3,89±0,87	4,21±0,80	$t(185) = -2,66^*$
Control	SLD	3,10±1,08	3,05±0,98	$t(56) = -0,15$
	WLD	3,19±0,99	3,33±0,96	$t(185) = -0,97$
Monitoring	SLD	3,62±0,71	3,23±0,88	$t(56) = -1,71$
	WLD	3,41±0,80	3,84±0,76	$t(185) = -3,70^*$
Information management capacity	SLD	3,07±0,69	3,11±0,81	$t(56) = -0,17$
	WLD	3,36±0,79	3,66±0,71	$t(185) = -2,74^*$

* $p < 0,05$ Note: SLD: Children with special learning difficulties, WLD: Children without special learning difficulties.

Discussion

The current study aimed to document the reference to the use of general knowledge strategies of cognition and special regulation strategies of cognition by Greek Elementary School students with and without learning difficulties. According to the results of the study, it becomes evident that both groups use meta-cognitive learning strategies, and those which prevail concern the knowledge of cognition in relation to those associated with the regulation of cognition. Students without learning difficulties reported significantly higher use of metacognitive strategies compared to that of the students with special learning difficulties.

Despite the significant difference in the frequency of use which is reported by the students without learning difficulties in comparison to the students with special learning difficulties, this difference appears to reflect a quantitative difference, not a difference in depth with respect to the kind of metacognition used. Thus, differences emerge among students, which refer to the kind (knowledge and regulation of cognition) and similarities in the depth of metacognitive processing. The similarities that emerge between the two groups concern the use of strategic 'knowledge of cognition which acts as the central factor in the process. The common difficulty of the two groups concerns the metacognitive process in depth, the regulation of cognition, which is a higher hierarchically level of elaboration. The differences in the metacognitive profile of the two groups show that students without learning difficulties outweigh those with learning difficulties in the knowledge of cognition. Consequently, students without learning difficulties outclass the others in elements of cognition such as the declarative, procedural and episodic knowledge.

Knowledge of cognition versus regulation of cognition

In total, students, regardless of their learning difficulties, state that they mainly use strategies of knowledge of cognition and less strategies of regulation of cognition. Similar findings are also reported by Roussos, Koulianos & Samartzis (2016). During their research on the relationship between metacognitive knowledge and self-regulated learning they ascertained for the whole sample higher performance in the knowledge of cognition and lower performance in the regulation of cognition. Additionally, Aydin & Ubuz (2010) on applying Jr. MAI on a Turkish student population found a wider use of knowledge strategies of cognition versus regulation strategies. A development type interpretation cannot be given in our case since both younger and older students use metacognitive learning strategies more, which concern the knowledge of cognition in relation to those associated with the regulation of cognition.

More specifically, girls with special learning difficulties present lower scores in knowledge and the regulation of cognition, statistically significant, compared to the girls without special learning difficulties. The same is valid for the boys with and without special learning difficulties, although they present lower scores than girls. The above is in line with various studies, such as those of Botsas & Padeliadou (2003), Geladari & Mastrothanasis (2010), Geladari, Griva & Mastrothanasis (2010) and many others, which argue that children with special learning difficulties present a lower performance in the use of metacognitive strategies compared to other classmates of theirs.

Comparison between genders

Regardless of the existence of special learning difficulties, in this research, girls appear to use metacognitive strategies more frequently than boys. In the whole sample girls in relation to boys appear to make greater use of cognition regulation strategies and not the knowledge of cognition. According to Kolić-Vehovec, Bajcsanski & Rončević (2010) "Metacognitive development in reading during this period is related to gender; as it was shown in the faster metacognitive development of girls compared to boys. However, the pattern of differences varies depending on the components of metacognition" (p. 328).

In a series of studies (Kolić-Vehovec & Bajcsanski, 2006; Kolić-Vehovec et al, 2010) researchers tried to compare whether findings obtained in Croatia would be similar in Slovenia, a neighboring country, with a similar language and schooling system.

The gender differences in metacognitive knowledge of reading strategies, as well as reading motivation, were examined in samples of 4th- and 8th grade students from Croatia and Slovenia. However, no differences on metacognition knowledge occurred between the boys in the Slovenian sample and the girls in the 8th grade, while boys in the Croatian sample still fell significantly behind girls. This difference was explained as a lack of motivation for reading exhibited by Croatian boys.

The reports about gender-related differences in metacognition occur in parallel with either significant differences in favor of females such as those of Ablard & Lipschultz, 1998; Carr & Jessup, 1997; Botsas & Padeliadou (2003), Geladari & Mastrothanasis (2010), Geladari, Griva & Mastrothanasis (2010), Vello, Rani & Hariharan (2015), in academic level students or insignificant differences according to Fennema, Carpenter, Jacobs, Franke & Levi, (1998); Lundeberg et al (1994), Padeliadou, Botsas, & Sideridis, (2002), Sperling, Howard, Miller, & Murphy, (2002) and Aydin & Ubuz (2010). According to Kolić-Vehovec et al. (2010) gender-based differences could emerge from educational practices that might not be equally beneficial for boys and girls.

Grade Comparison

In the current study we found similarities in the metacognitive profile of the 5th and the 6th grade as to the frequency of use of knowledge strategies of cognition versus the strategies of regulation of cognition. Students in both grades use more often metacognitive learning strategies related to the knowledge of cognition than those associated with the regulation of cognition. Researchers as Schraw and Dennison, (1994), Sperling et al. (2002), Baker (2005), Aydin & Ubuz (2010) support the view that differences in metacognition are caused in part by the differences in the grade level which are in favor of students of higher grades. However, in the research of Sperling et al. (2002) no differences in the use of strategies were found despite the initial assumption. In the research of Aydin & Ubuz (2010), there was a significant difference in the average among grade levels only on the scale knowledge of cognition. On the other scale, regulation of cognition, tenth grade students again had higher awareness of their regulatory processes; however, they did not appear significant. This may be because, as Baker (2005) has noted, students in upper elementary education are cognitively prepared for metacognitive improvement, but at the same time their intrinsic motivation for learning decreases.

In our research results revealed differences in metacognitive profile of the 5th and 6th grade. Sixth grade students show an increased report of usage of strategies of knowledge of cognition and regulation of cognition compared to the students of the fifth grade. But both aged groups prefer the usage of knowledge of cognition strategies versus regulation of cognition. There are several possible explanations for the obtained pattern of age differences in Jr. MAI (Kolić-Vehovec et al., 2010, 337). First, this pattern of differences could be in part due to motivational factors, including social desirability and the perceived value of studying, which is emphasized at younger ages. Second, in older students some aspects of strategic reading become automatic and are no longer under conscious control. Thus, lower ratings reflect a lack of awareness due to automatized processing rather than a lack of the use of reading strategies. Third, it is possible that younger students overestimate the frequency of strategy use as a consequence of their inadequate self-assessment. Fourth, younger students might use strategies more often but in an inefficient way.

Implication of Research Findings

The recording of the profile of the students with and without special learning difficulties opens the way both academically and searchingly for changes in the teaching planning. Students seem to use metacognitive strategies which are mostly limited to the knowledge of cognition, the declarative, procedural and casual knowledge of the individual and not to the regulation of cognition, planning, monitoring and control (Sperling et al., 2002). Thus, the integration of tools, such as the MAI Jr is considered essential before, during and in the end of each educational effort for both the students and the teachers.

The integration of metacognitive strategies in all stages of the educational process will enhance the cognitive efforts and performance of all students. Teaching should be understandable, gradual and focusing on all parameters of metacognition according to the developmental and special learning needs of the children (Mastrothanasis & Geladari, 2016).

Moreover, regardless of the special learning difficulties, the difficulty of the students to use higher level strategies of regulation of cognition opens up to the discovery of deficiencies in educational planning and creates the need for the development of these strategies in the classroom.

Recommendations for Further Research

Evidently, the necessity for a new direction in the teaching approaches is fashioned for students with or without learning difficulties. Furthermore, we need to know what kind of strategies of self-regulation students are taught in school (Veenman, Van Hout-Wolters & Afflerbach, 2006).

The findings show the importance of direct recording of the metacognitive profile of the teachers. Such future research will shed light on the kind of metacognitive strategies used by teachers in their daily teaching practice.

This research was carried out in a single region. Future research on a larger sample and a larger age range will shed more light on the use of metacognitive knowledge and regulation strategies at every age and in every region.

Furthermore, it is important to draw a systematic study of the way in which the transfer of strategies for students with special learning difficulties will be cultivated (SLD).

Brown, Armbruster & Baker (1986) mention that the knowledge of cognitive processes (first kind of metacognition) develops slowly, that is, the knowledge that previous information is important for the reading comprehension, how to use the preliminary strategies for the text inspection in order to detect their previous knowledge, when and why should they adjust their reading speed to achieve goals set for the specific reading intervention. Taking into consideration that the good readers develop their metacognitive abilities after the third grade of the primary school, while children with reading disabilities do the same thing after the sixth grade, the planning of teaching strategies should be investigated in order to meet the needs of the students.

In Greece students do not seem to understand the metacognitive strategies as a special kind of strategies (Kostaridou-Eukleidi, 2005). This happens either because students do not use metacognitive strategies widely or because they are not aware that they use them or that they had never been taught how to use them. It constitutes a mere conjecture which must be checked by means of research that if the educational system cultivates and requires their use regardless of the cognitive strategies, then students will be able to consciously apply them and thus develop an awareness of their different role.

Conclusion

The basic objective of this research was the investigation of the metacognitive strategies of the knowledge and regulation strategies of cognition of Greek students with and without special learning difficulties. Students without special learning difficulties seem to outclass in elements of cognition such as the declarative, procedural and episodic knowledge - high perception of self-efficiency. However, despite the differences in the frequency of use of metacognitive knowledge and regulation strategies of cognition both teams face difficulty in the metacognitive process in depth (cognition regulation of an upper hierarchical level of treatment).

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Affective Factors and Reading Achievement in Different Groups of Readers

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Abstract

This paper is part of a wider survey in which we identify groups of readers aged 10 to 11. The paper presents the findings on the observed affective variables (attitude and motivational) of different groups of readers. The results show that individual's attitude towards reading has the impact on reading comprehension and vice versa, better reading comprehension represents a higher possibility for an individual to choose to read. All identified groups of poor readers read less. An insight into individual's perception of their own reading abilities indicates some particularities; the group of children with difficulties in reading comprehension, but a good decoding evaluate their reading abilities higher than children with dyslexia, who manage to compensate their decoding problems and show good reading comprehension. The results show that the evaluation of the importance of reading is related to one's own perception as a reader, while the frequency of reading is more related to individual's reading performance. Affective factors may be the cause or the consequence of reading difficulties and cannot be overlooked while planning a support.

Keywords: *reading comprehension, reading attitude, reader's reading confidence, reading motivation, groups of readers*

Introduction

Different authors (e.g. Alexander & Filler, 1976 in McKenna, Kear & Ellsworth, 1995; Guthrie & Wigfield, 1997) associate attitude towards reading to individual's sensations experienced during reading which either motivate or discourage reading activity. It is a relatively permanent attitude towards reading and everything associated with it and can be either positive or negative (Pečjak, 1999). Its formation is influenced by several interrelated components (Faman, 1996 in Partin & Gillespie, 2002). The child's attitude towards reading, motivation, interest in reading they all shape their reading behaviour. Positive or negative attitude towards reading activities have a significant influence on the amount of reading for pleasure and child's reading achievement (Partin & Gillespie, 2002). There is a correlation between these factors. The more reading for pleasure, the better reading performance (Cunningham & Stanovich, 2001), which encourages individual interest in reading, creating favourable conditions for the formation of a positive attitude towards reading.

A positive attitude towards reading is a result of several factors. Among them authors (e.g. Guthrie & Wigfield, 1997) expose the influence of home background (parent-child joint reading, parents' attitude towards reading and their reading habits, access to reading material, etc.). Positive reading experience is important especially in the preschool and early school period (Pečjak, Bucik, Gradišar & Peklaj, 2006). With the systematic literacy process, the child's attitude towards reading is additionally influenced by their reading achievement. The relation between reading attitude and reading achievement is particularly disadvantageous for children with reading difficulties. They need to put much more effort into reading activity and are more frequently faced with failure. All this may eventually lead to reluctance towards reading and reading activities (Pečjak et al., 2006). Consequently, the child reads less and less, which might further lower reading efficiency. Negative feelings during reading thus increase; consequently, children increasingly lag behind their peers in both reading as in all other learning activities based on reading and language. Conversely, good readers continue to improve their reading and become more and more motivated for it, building their vocabulary and general knowledge, which additionally contribute to their overall learning achievement. The interaction between the reading experience, reading / learning achievement and reading motivation was designated by Stanovich (1986 in Cunningham & Stanovich, 2001; Wren, 2001) by the term »Matthew effect« (named after a passage in the *gospel of Matthew*: *'The rich will get richer and the poor will get poorer.'*).

Experts observed the decrease of reading interest through the years of schooling in boys and girls (Pečjak, Bucik, Gradišar & Peklaj, 2006). In higher grades the classroom reading becomes more demanding; children operate with more complex reading materials (Biancarosa & Snow, 2006). They are expected to acquire new information through reading (learning by reading) efficiently. Reading thus becomes more and more related to school performance (Pečjak et al., 2006). Walberg and Tsai (1986 in Partin & Gillespie, 2002) focused on the attitude towards reading in adolescents and pointed out the following factors with a positive effect on it: reader's belief about the importance of reading, pleasure of reading, (sense of personal competence in reading) and encouraging home environment. S. Pečjak et al. (2006) list the first three factors among the elements of intrinsic motivation. These also include being absorbed in reading (i.e. *'being highly focused on the reading material with increased mental activity'*) (Pečjak et al., 2006, p. 40).

In addition to internal motives, children can be encouraged to read by commendation, desire to get a good grade, competition between peers, complaisance (e.g. want to live up to teacher's expectations), possibility for cooperation with others, etc. (elements of extrinsic motivation)

Patrick Proctor, Daley, Louick, Leider and Gardner (2014) studied the role of extrinsic and intrinsic motivation, as well as the sense of reading competence in adolescents with reading

difficulties (aged 11 to 15). Their sample included 76 children (different groups of children with special needs). They separately studied the group of children with special needs coming from a different language environment (37 children). The results obtained by the authors, related to the correlation between the motivation factors and reading comprehension are conform to the findings obtained by the Slovene authors (Pečjak, Podlesek & Pirc, 2009 in Pečjak, 2010). The sense of one's own (in)competence has a direct impact on reading comprehension in older children (nine-year primary school). Other factors of intrinsic (and extrinsic) motivation are not directly related to reading comprehension (Patrick Proctor et al., 2014). It is interesting to note that the authors observed a similar relation between the motivation factors and reading comprehension in children from different language environment, although they obtained significantly lower results at reading comprehension test as compared to other children. Despite the significant influence of language knowledge on reading comprehension, the language status proved not to be an important factor of reading motivation. In spite the difficulties, some children managed to maintain the confidence in their own reading abilities, accepting the reading efforts as a challenge, believing that their reading difficulties could be overcome (Patrick Proctor et al., 2014). In this process, teachers can assume an important role (parents or other people important to a child) by encouragement, giving examples and choosing suitable reading materials (appropriately demanding, adapted to child's interest). The results obtained by the authors may reflect the heterogeneity of the sample (it included long-term ill children, children with emotional and behavioural disorders, specific learning difficulties), whereby authors do not indicate the results of different groups of children with special needs, nor did they verify the level of reading comprehension in children from a different language environment for the texts in their mother tongue.

Among children with reading difficulties there is a higher possibility that they will attribute the causes for their poor reading to external factors (e.g. teacher, demanding texts, lack of time, etc.) or to those internal factors which they cannot have influence upon (e.g. abilities) (Lipeč- Stopar, 2005). The perception of reading as an activity that is too demanding, difficult to manage, may in time manifest itself in the sense of the learned helplessness (especially in children from a less encouraging environment) (Switzky, Harvey, 1997), when a person believes that they cannot do anything to improve their reading (Seligman, 1975 in Fogle, 1978).

Even though the extrinsic motivation is important for achieving learning and reading objectives, it has short-term effects. (Pečjak et al., 2006). Therefore, the planning of literacy acquisition process requires a special reflection on how to organize the class reading, in order to encourage child's curiosity and interest in reading (Switzky Harvey, 1997). In addition to the appropriate choice of reading materials, it is essential to carefully plan the debate about the text's content. Highlighting different roles of reading (reading for acquisition of new information /learning/relaxation/pleasure) and individual's different attitudes towards this activity, class reading needs to be organized as a challenge worth undertaking.

Methods

Participants

The sample included 460 children, good and poor readers who were, at the beginning of the test, aged 10 years and 0 months to 11 years and 4 months. In the sample there were slightly more boys than girls, with the ratio still suitable for ensuring the comparability of groups according to size (54,3% boys and 47,7% girls). Given that, in the research the standardised instruments were not used; the inclusion of both, good and poor readers provided the comparison

of results of different groups and the definition of reference values on the basis of which we can determine good and poor results for individual measurement.

Data Collection Instruments and Procedure

To get an insight into individual components of reading attitude, a questionnaire was used, shortly named reading evaluation questionnaire. It was formulated on the basis of the Denver reading attitude survey (Davis & Rhodes, 1991), published in the manual Literacy assessment: A handbook of instruments (Rhodes, 1993), which collects aids for evaluating different reading components and can be used by teachers.

The questionnaire provides an insight into three different areas related to individual's reading attitude: frequency of reading activities (reading usage), perception of importance of reading and confidence in proper reading abilities. Originally, the questionnaire contained six questions for each of the areas in which children responded by selecting one of the answers on a five-point scale.

The questionnaire was tested and the construct validity was calculated for it. In the final version, we maintained only the questions which have the highest correlation with the three components of the questionnaire that were observed. Table 1 shows the final correlation matrix of correlation between individual questions and a single component of the questionnaire.

Table 1. Rotated Component Matrix

	Component 1 Reading confidence	Component 2 Reading usage	Component 3 Perception of the importance of reading
Quest._7	,826		
Quest._12	,813		
Quest._17	,752		
Quest._9	,694		
Quest._18		,791	
Quest._11		,665	
Quest._14		,645	
Quest._13		,511	
Quest._3			,678
Quest._4			,666
Quest._1			,649
Quest._5			,616

The reliability of the instrument for the complete questionnaire, calculated according to the Cronbach's alpha model is 0,79, whereas for single areas of the questionnaire which represent independent variables is 0,60 (component 3), 0,63 (component 2) in 0,80 (component 1).

The second questionnaire, motivation questionnaire, gives an insight into individual's source of reading motivation which is manifested in the perception of reasons for one's success or failure in activities related to reading (intrinsic, extrinsic), and as an additional dimension of internal factors which one can or cannot control.

The questionnaire designed was based on Weiner's cognitive approach to motivation, i.e. Weiner's attribution theory (Weiner, 1992). Cognitive explanation of motivation starts with the assumption that all the attempts for understanding our success or failure, we ask ourselves "Why?" Children can attribute their success or failure to their abilities, efforts, knowledge, luck, help, clear instructions, interferences caused by others, etc. Attribution theory of motivation

describes the influence of one's explanations or excuses on their motivation (Woolfolk, 2002). According to Weiner, most of the attributed reasons for success or failure can be described in three dimensions:

1. locus (place of the reason – inside or outside one's self),
2. stability (whether the reason is constant or it varies),
3. responsibility or control (whether the person can or cannot control the reason).

In our questionnaire we focused on the first and the third dimension. In total, it contains 20 different statements which represent events related to reading; 10 events with a positive outcome (e.g. I read the story quickly, without any difficulties.), and 10 with a negative outcome (e.g. I read the story, but I did not manage to answer the questions.). Children were instructed to imagine that events happened to them and were asked to select one out of four statements representing the reason for individual event. Two statements represent an external reason of success or failure and two an internal reason; in the latter, one answer represents a child's ability of influencing the events, whereas the other represents some characteristic that children cannot influence.

Example:

Event with a negative outcome

I made many mistakes at reading out loud

External control

...because the text was poorly written.

Internal control / possibility of influence *...because I did not try enough.*

Internal control / no possibility of influence *...because reading is very difficult.*

External control

...because the text contained many unusual words.

The reliability of the instrument calculated by Cronbach's alpha model is for the complete questionnaire 0,92, but the more relevant data are those for each separate category of answers, confirmed by the importance of Tukey's coefficient. Cronbach alphas for each category of answers are much lower, and they range from 0,61 to 0,74.

Methods of data processing

A brief explanation is needed, about the way the groups of readers (subject of our observation, compared according to affective factors) were identified as this work, is part of a wider research.

With hierarchical cluster analysis different, relatively homogeneous groups of readers were identified, namely the groups with a maximum similarity between individuals on selected variables and a maximum diversity between groups (Adams, 1985). We used Ward's hierarchical agglomerative method which enables a meaningful interpretation of the groups obtained. Ward's method is often used in taxonomic studies (Afifi & Clark, 1984), as well as in the field of taxonomies of reading difficulties. With this method, the number of groups is not known beforehand, that is why the aim of the use of the method is to get the optimal solution; this being the decision of the one who uses the method and interprets it. The number of groups in the final interpretation was thus adopted on the basis of comparisons between different solutions, by observing the preliminary and further integration of groups in the dendrogram which graphically represents the formation of groups, namely integration of subjects in single steps of classification.

The groups in the next step are additionally described by the variables which did not enter the cluster analysis. The differences between the observed groups were established by the variance analysis. The post-hoc Tukey HSD test was used to accurately determine among which groups there are statistically significant differences.

Results and discussion

The results of the observed variables are shown in Table 2. They are distributed in groups which were formed by the use of cluster analysis. Given that this paper is focused only on the affective factors of the identified groups of readers, let us start with summarizing their other characteristics, identified in a wider research.

The first group, named '*group of readers with compensation dyslexia*', is characterised by the above-average cognitive abilities and listening comprehension which is highly correlated with reading comprehension (Stanovich, Cunningham & Feeman, 1984; Aaron, 1991; Just & Carpenter, 1987). A particularity of this group consists in a discrepancy between the two components of reading comprehension. Children do not have difficulties with general and language knowledge, their reading difficulties are manifested when reading aloud and during the time-limited reading; they read inaccurately with below-average speed and with a higher number of errors. They have difficulties with rapid and automated language processing, this probably being the basis for the reading difficulties in this group of readers. These difficulties which are reflected in the poorer reading technique are compensated by relatively good usage of context, enabling them a relatively good reading comprehension.

The second group, named '*the group of quick readers with average comprehension*', is the most numerous among all groups. The readers in this group have average cognitive and language abilities, their reading is quick and accurate; their comprehension is, in all variables, around the average values. Reading has the same level, regardless whether reading is time-limited or if they themselves establish the time of reading. These are readers with a good reading technique; their comprehension is within the average values that apply to the entire sample. This confirms the fact that a good reading technique is a necessary, but not a sufficient condition for a good reading comprehension.

The third group, named the '*non-specific group of poor readers*', is the group with the lowest level of cognitive abilities, but with no problems with quick naming and short-term memory for letters and numbers. All other results, namely the results on tests for determining the reading technique, as well as the results for reading comprehension are below average. They indicate difficulties in decoding speed and accuracy, poor vocabulary and difficulties in reading comprehension.

The fourth group of readers with average cognitive abilities, named "*the group of non-compensated dyslexic readers*", has significantly lower results in all tests, as compared with other groups; unlike the third group, the fourth group manifests the difficulties with quick naming and short-term memory. Their reading is extremely slow, inaccurate, with the highest number of mistakes among all groups; their reading comprehension is low in all measurement conditions, irrespective of the type of reading material.

The fifth group, named '*the group of readers with hyperlexia*', is numerically the smallest, which corresponds to an otherwise normal incidence of this type of reading difficulties. This group is characterized by a good reading technique: they read quickly, making only few mistakes. They, however, obtain markedly below-average results in all tests of reading comprehension. They have slightly lower cognitive abilities; they have lower level of listening comprehension which is considered a direct indicator of reading comprehension potential. Children in this group have thus a well-developed reading technique but have a poor understanding of what they decode.

The sixth group includes "*good readers*", namely readers with no reading difficulties. They are characterized by quick, fluent reading, with rare reading errors; their good comprehension is evident in answering questions of both, lower and higher level; they

summarize well what they read. They are additionally characterized by the highest cognitive potential, memory, listening comprehension and processing speed.

Table 2. Presentation of Evaluation of Parameters for Each Group: Variables of Reading Evaluation and Motivation Variables

	1 st group N=90		2 nd group N=105		3rd group N=68		4th group N=71		5th group N=35		6th group N=91 M
	M	SD	M	SD	M	SD	M	SD	M	SD	M
Reading usage	10,64	2,99	10,78	3,11	9,40	2,93	8,73	3,57	9,40	3,84	11,89
Reading confidence	10,73	3,30	12,28	2,69	10,34	2,86	8,07	3,44	13,37	3,39	13,85
Evaluation of the importance of reading	14,19	2,51	14,26	2,46	13,00	2,98	12,21	3,60	14,74	1,37	14,42
External factors	4,68	2,03	4,44	1,82	5,41	2,00	5,75	2,21	4,91	2,10	4,10
Internal factors	5,06	2,09	5,50	1,85	4,03	1,92	3,69	2,28	5,00	2,10	5,73

M – arithmetic mean, SD – standard deviation

Statistical significance of the differences between all observed groups was first confirmed with the variance analysis (Table 3). Further on, post-hoc Tukey HSD test showed the significance of differences between individual groups (Table 4, 5, 6).

Table 3. Variance Analysis of the Variables of Reading Attitude

	F	Sig.
Reading usage	6,480	,000
Reading confidence	29,504	,000
Evaluation of the importance of reading	3,416	,005

All three groups of poor readers, including the fifth group of readers with hyperlexia, with good reading technique read less, especially those from the fourth group (group of readers with decompensated dyslexia) who otherwise achieve the lowest results in all reading tests. The frequency of reading is in the first group (readers with compensated dyslexia) only slightly lower than in the group of average readers (group of quick readers with average comprehension) (Table 4).

Table 4. Tukey HSD test – 'Reading usage'

Ward's method (group)	1	2	3	4
4	8,37			
3		9,40		
5		9,40		
1			10,64	
2			10,78	
6				11,68

Important information is given by the reading confidence variable which gives us an insight into individual's perception of their own reading abilities (Table 5). Among the '*poor readers*' there is a significant upward deviation for the group of '*readers with hyperlexia*' (5th group) who, despite the difficulties in reading comprehension, have a good reading confidence, even better than the 1st group (readers with '*compensated dyslexia*') who do not have such a high reading confidence and demonstrate similar results as the 3rd group of markedly '*poor readers*'.“ The 4th group of readers with '*decompensated dyslexia*' who, despite their good cognitive potential, achieve the lowest results in all reading tests and have the lowest reading confidence. Interestingly, both groups of readers without difficulties (good and average readers) do not differ significantly in evaluating their own reading achievement.

Table 5. Tukey HSD – 'Reading Confidence'

Ward's method (group)	1	2	3	4
4	8,07			
3		10,34		
1		10,73		
2			12,28	
5			12,37	
6				13,85

Although all groups recognize a considerable importance of reading, even here we can observe significant differences (Table 6). Again we can see the downward deviation in overall result for both groups of '*poor readers*' (3rd and 4th group), while the 5th group of readers (*readers with hyperlexia*) do not deviate significantly on this variable from the groups of average and good readers. This is probably related to the reader self- perception which is much higher in the 5th group, as compared to the 3rd and the 4th group.

Table 6. Tukey HSD – Evaluation of the Importance of Reading

Ward's method (group)	1	2
4	12,21	
3	13,00	
1		14,19
2		14,26
6		14,42
5		14,74

Comparing the groups on all three variables, we note that the variable most harmonised with the reading achievements, is that which represents a real reading usage. If we were to rank the groups according to reading achievements, we would get the same ranking as if when taking into account the variable of reading usage – the more difficulties, the less frequent the reading usage. The other two variables are most markedly low in the group of poor readers, with higher cognitive potential and the lowest reading achievement – namely in the 4th group of children with *decompensated dyslexia*. The children from the group of *readers with hyperlexia* (5th group) consider themselves as good readers, even better than those from the group of readers with *compensated dyslexia* (1st group). This influences their general attitude towards reading; it being better than in all other groups with reading difficulties. We can thus conclude that the evaluation of importance of reading is closely associated to individual's reading confidence, while the actual reading usage is more associated to individual's actual reading achievement.

The results of the motivation questionnaire (Table 2) give an insight into the source of reading motivation for individual groups which is shown as the cause of success or failure in reading activities (extrinsic, intrinsic) and as additional dimension of internal factors which vary, depending on whether an individual can influence them or not. Again, we can observe certain rules applicable in the relationship between internal and external factors. Readers with marked difficulties see their failure as the result of external factors, or those internal factors over which they have no influence. While in the group of readers with *compensated dyslexia* (1st group) and those with *hyperlexia* (5th group) there are no significant differences in choosing between internal and external factors, *the group of average readers* (2nd group) more often chooses internal factors. The better the readers, the more often they attribute the responsibility for their success to themselves. However, observing the number of answers related to the choice of internal factors, we can see that the best readers do not achieve the highest values, namely the best readers attribute their success to themselves, but this is not necessarily due to their effort, but rather due to their abilities, namely internal factors, something over which they cannot have influence.

Comparing the groups according to the frequency of their choosing of internal, controlled factors shows that the highest values are obtained by the group of *readers with compensated dyslexia* who frequently see the reasons of their success or failure in effort and time they put in reading, namely factors which can be influenced by them. This is probably the key to their overcoming of difficulties successfully that they still have in the reading technique.

Conclusion

The results of this research can serve as the starting point for creating a variety of approaches of support for children with reading difficulties as they provide an insight into the weak and strong points of identified groups of poor readers on different components of reading comprehension.

The basic guidelines of support consist in the combination of a wide range of reading activities which stimulate children to read; with guided teaching of skills still not mastered; them being a prerequisite for reading at the next stages of development. In addition to the basic guidelines for the planning of support for children with reading difficulties, i.e. early identification of problems and early intervention, additional time for learning how to read, using appropriate learning materials, working with small groups of children with similar problems, creating a comprehensive programme involving all important areas of reading comprehension development (Carnine et al., 2004), stimulating curiosity and interest in reading (Switzky Harvey, 1997), consideration should be given to the need for frequent monitoring of a child's progress and for including relevant feedback related not only to the reading technique but also to the reading comprehension. The latter is, according to the results of the research, important for individual's reading confidence and their motivation for the activities which involve reading. The results of studying affective factors in individual identified groups of readers confirm that it is the frequent use of reading skills that in turn influences better reading, forming thus the base (but not a guarantee) for individual's frequent involvement in activities which include reading. Individual's perception of their own reading abilities largely depends on the feedback received in relation to reading. This explains the reading confidence in children with hyperlexia who, despite difficulties in reading comprehension, positively evaluate their reading abilities, as they often receive positive feedback particularly in relation to the reading technique and less to their reading comprehension. Conversely, we note poor evaluation of their reading abilities in children with compensated dyslexia who, despite their poor reading technique, have a relatively good reading comprehension. This observation can be an important guideline for teachers when forming the feedback. Based on the results, we can conclude that reading achievements most relevantly coincide with the frequency of reading activities; more difficulties indicate less reading. Evaluation of the importance of reading is closely related to one's view of themselves as readers. Reading achievements are additionally reflected in the differences between the groups in terms of attribution of one's success/failure in reading. Better readers often attribute success to themselves. Conversely, readers with marked difficulties more often attribute their failure to external factors or those internal factors they cannot have influence upon. An important cue for planning work with all groups of readers with difficulties in reading comprehension is given by the findings related to the group of children with compensated dyslexia. This group of readers, as compared to other groups, achieved the highest result in measuring the frequency of choosing internal, controlled factors. This means that these readers attribute the reasons for their reading achievements to the amount of effort and time dedicated to reading, etc. For improving the reading achievements of all groups of readers, regular and suitable implementation of reading exercises is essential. It is equally important that children themselves become aware of the importance of the amount of effort and time dedicated to reading practice for overcoming their reading difficulties. Teacher can contribute to such awareness by giving sense to the reading practice and by introducing peer support. Planning of reading practice and support for readers with difficulties must additionally include the reflection on the role of affective factors on reading and the ways to influence them.

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High Support Need and Minimally Verbal Children with Autism Playing a Preference Based Computer Game: A Pilot Eye-Tracking Study of Four Individual's Attendance to Eyes

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Abstract

Individuals with autism often exhibit atypical levels of attention to eyes. High support need and minimally verbal individuals with autism have typically received less attention in research. This study explored a preference based computer game to include the less-studied individuals with autism in their own school environment. Four high support need and minimally verbal children with autism played a familiar computer game where correct decisions were contingent on attending to the eyes of a virtual character. Case control analyses were used to compare individual's results to a control group. The analyses revealed that one child spent less time looking at the eyes than did the controls, and two children did not differ from the controls. There was no usable data for the fourth child. Our results suggest that high support need and minimally verbal children can be included in eye tracking research by using familiar positive environments.

Keywords: *autism, high support need, eye-tracking, visual perspective taking, case- control method*

High support need (Strnadová, Cumming, & Marquez, 2014) and minimally verbal individuals (Tager-Flusberg & Kasari, 2013) with autism spectrum disorder (ASD) have been variously defined in the research literature. They have also received less research attention than their higher-functioning counterparts (Grynzspan et al., 2013; Kylliäinen et al., 2014; Simmons et al., 2009; Tager-Flusberg & Kasari, 2013; Whittaker, 2012). This lack of research may be due to the difficulty involved in matching and grouping individuals together (Burack et al., 2004; Jacobsen, 2000). These individuals are also a group for whom alternative testing methods should be explored, as standardised assessments may not be suitable due to lack of interest in the tests and their verbal nature (DiStefano, & Kasari, 2016; Kasari, Brady, Lord, & Tager-Flusberg, 2013; McGonigle-Chalmers, Alderson-Day, Fleming, & Monsen, 2013; Skwerer et al., 2015).

One of the key criteria for diagnosing ASD is impairment in establishing and maintaining eye contact. Impairments have also been shown in joint attention (Korhonen, Kärnä, & Rätty, 2014), gaze cueing (Nation & Penny, 2008), looking time (Guillon, Hadjikhani, Baduel, & Rogé, 2014), and visual perspective taking (Pearsons, Ropar, & Hamilton, 2013), all of which require the person to attend to the eyes of another person. These abilities are also considered to be associated with the social deficits observed in ASD (APA, 2013; Jones, Carr, & Klin, 2008; Jones & Klin, 2013). Due to the importance of eyes in social communication and a person's life, eye-tracking studies have been used to obtain more accurate and objective knowledge about eye contact and attention to eyes.

One of the first eye-tracking studies, which focused on attention to eyes in individuals with ASD, found reduced fixation on the eye region (Pelphrey et al., 2002). In a task that called for viewing emotional faces, if no specific instructions were given, the study's five adult males with ASD showed less fixation on the eyes than typically developing individuals (TDI). Further studies have confirmed these impaired eye attendance findings (e.g., Boraston et al., 2008; Corden et al., 2008; Dalton et al., 2007; Klin et al., 2002). However, contradictory results have also been found (e.g., de Witt et al., 2008; Falck-Ytter et al., 2010; Rutherford & Towns, 2008; van der Geest et al., 2001). Recent reviews have produced conflicting results in eye-tracking research—for instance, the finding that individuals with ASD are less likely than their TDI counterparts to look into the eyes of another person (Papagiannopoulou, Chitty, Hermens, Hickie, & Lagopoulos, 2014), or the conclusion that only a few studies have found impaired attention to eyes in individuals with ASD (Guillon et al., 2014). This article explored whether high support need and minimally verbal children with ASD could be included in eye-tracking research when the task was designed based on a preference based computer game that had produced positive user experiences (Mäkelä, Berdnarik, & Tukiainen, 2013). We were interested whether these children have atypical temporal attention to eyes. The game was a minimally verbal visual perspective taking task.

Perspective taking is a skill that helps people infer and predict the actions, desires, and beliefs of other people (LeBlanc, Coates, Daneshvar, Charlo-Christy, & Morris, 2003). To function in the social world, one needs to be able to take other people's perspectives into account (Flavel, 1977). Overall, it is thought that perspective-taking ability is associated with empathizing and the ability to understand the other person's point of view (Mattan, Rotshtein, & Quinn, 2016). The ability to understand what other people see is referred to as visual perspective taking (VPT) (Hamilton, Brindley, & Frith, 2009). There are two levels of VPT: Level 1 concerns the ability to ascertain whether the other person sees an object and understand the line of sight and obstructions to the line of sight. Two-year-olds can pass these tasks. Level 2 concerns the ability to understand that the other person sees objects differently depending on their point of view; in this task, even adults have difficulty in this task within naturalistic contexts (Moll & Tomasello, 2004, 2006; Pearson, Ropar, & Hamilton, 2013).

Individuals with ASD have impaired VPT and gaze following, which has been demonstrated by studies such as those requiring children to see where another person is looking. Riby et al. (2013) found that children with ASD looked less at the face and eyes, were less accurate than controls at naming gazed-at objects, and, even when cued, did not increase their looking time at the

gazed at objects. In addition, Falck-Ytter et al. (2012) showed that children with ASD demonstrated less accurate gaze following (correct/incorrect gaze shifts) and showed less correct gaze shifts than TDI children when looking at the gazed-at objects. However, there are contradictory review findings regarding the VPT ability of individuals with ASD (Pearson, Ropar, & Hamilton, 2013). Therefore, in contrast to group-level analyses that found discrepancies in attending to eyes and VPT, this study concentrated on individual-level analyses to detect possible variations between individuals' performance; it has been suggested that these variations influence eye attention research (Ames & Fletcher-Watson, 2010; Bruinsma, Koegel, & Koegel, 2004; Korhonen et al., 2014). Primarily, the individual design was used because high support need and minimally verbal children are difficult to group together.

This research endeavored to explore to include high support need and minimally verbal children in order to see whether diminished attention to eyes was present during a computerized VPT game where eye attention was necessary to play the game successfully. Overall, it has been found that computerized tasks and technologies have motivational advantages for individuals with ASD (e.g. Grynspan et al., 2013). As motivation is thought to influence looking times in children with ASD (Falck-Ytter, 2015), therefore, in order to encourage the participants to engage with the task, its format was based on a previous computer game designed for children with ASD (Korhonen, Virnes, & Kärnä, 2014) which had produced positive user experiences (Mäkelä et al., 2013). It has already been shown that children do not play the game used in this research randomly; thus, it can be assumed they are demonstrating typical interpretation of the information the eyes provide (*Blinded for review*). Therefore, this study further explored the game to see whether an individual high support need and minimally verbal child with ASD has an atypical total dwelling time in the eye area compared to TDI children when making correct decisions in a task requiring attention to eyes.

Method

As the data were gathered simultaneously with the previous study, the method sections are highly similar (Korhonen, et al. 2016).

Participants

This study had an ethical premise for a small number of participants as it was the first of its kind to investigate high support need and minimally verbal children with ASD using portable eye-tracking methodology while playing a standing up computer game. Hence, it only looked at four individuals. Piloting is particularly important in this population; research methodologies need to be carefully planned due to the children's backgrounds, skill levels, and especially because of the potential harm that failure and frustration may bring to their daily lives (e.g., Burack, Iarocci, Flanagan, & Bowler, 2004).

Children with ASD

A convenience sampling method was used. Four high support need pupils from a regional school for individuals with special needs—which uses an adjusted syllabus due to pupils' poorer academic performance—participated in the study. The study took place in a familiar setting at the children's school. All the children were previously diagnosed with ASD (based on ICD-9 criteria) and assessed as high support need (e.g. Strnadová, Cumming, & Marquez, 2014) and minimally verbal (e.g. Tager-Flusberg & Kasari, 2013) by school services (medical doctor, speech therapist, and teachers). A teacher-rated Autism Spectrum Screening Questionnaire (ASSQ) was used with a sensitivity/specificity of 0.73/0.74 for clinical populations and a cut-off score of ≥ 22 (Mattila et al., 2012). The ASSQ scores for the four participants (23, 36, 41, and 30) were all above the cut-off score. The participants were all male, and their age levels were equivalent to those of Finnish primary and secondary school pupils (ages: 9, 12, 14, and 11 years). See Appendix A for more detailed descriptions of the children.

Standardized test results could not be collected because the tests were stopped based on the children's systematic task-irrelevant behavior, such as inventing their own play action unrelated to the task, and an evaluation of their willingness to participate. Further testing with these children was not considered due to the possibility of causing too many negative emotions (such as feeling unsuccessful, forced to participate, or unable to understand the task), which could adversely influence their schooling and everyday life. More subjectively, the teachers and researchers characterized these children as having extremely limited use of verbal language; they mainly used single words, expressed echolalic speech, and most often communicated non-verbally but could understand simple and clear verbal requests and instructions. All the children participated based on their own, parental, and school consent. The children's consent was received by asking verbally and pictorially, and their willingness to participate was monitored and evaluated by the school staff and researchers. This research was approved by the Research Ethics Committee of the University of Eastern Finland.

TDI Children

A convenience sampling method was used: Finnish universities have teacher training schools designed to work in collaboration with researchers. This study involved all consenting and TDI second grade primary school children from the university training school; their individual consent, as well as that of their parents and school, was obtained. Second grade was selected to ensure that the youngest participants age-matched the youngest individuals with ASD: the mental and language age in the control group was therefore either at least equivalent but more likely higher than the level of the youngest child with ASD. This age-matching was done because the participating children with ASD demonstrated considerable task-irrelevant behavior during testing and hence cognitive levels could not be matched. The school reported that the participating children had no medical, psychological, or neurological diagnoses nor other learning disabilities or difficulties. A teacher-rated ASSQ was used to exclude potential individuals with ASD: for the whole population sample, the sensitivity/specificity was 1.00/0.94 (ASSQ: Mattila et al., 2012), and the cut off was ≤ 7 (Mattila et al., 2012). The ASSQ scores in the TDI group were all below the cut-off; all scores were < 3 . Altogether, 16 TDI children between the ages of 8 and 9 participated in the study (8 males and 8 females). The study took place in a familiar setting at the children's school.

Materials and Measures

Game apparatus.

The VPT game ran on the Visual Studio® software on a PC computer using the Microsoft Windows® operating system with a Kinect sensor, Microsoft Xbox 360® (version 1.8). The Kinect sensor has an operating range from 0.8 to 4.0 m and features 640 x 480 resolution (30 frames per second). The game was played on a white screen with a VGA connection to a projector/smartboard. Xbox Kinect® uses body movement in its games (see Ilg et al., 2012; Munson & Pasquel, 2012).

The Kinect sensor was placed in front of the player below the white screen (see Figure 1a. for an example of game playing on Kinect and Figure 1b. for the layout of the game playing). No physical contact with the screen was needed. The player saw a silhouette of him- or herself and used the silhouette of his or her hand to select and catch items on the screen by placing either hand on top of the item. The software was programmed to only allow hands to make the selection. The distance to the screen could be altered by the player moving within the room; hence, the visual angle was not constant. The size of the screen was 2.6 m (width) x 2.01 m (height), and the projected image was 2.1 m x 1.54 m.

Eye-tracking apparatus.

Portable SMI (Senso Motoric Instruments, Germany, www.smivision.com) eye-tracking glasses were used for data recording. Two small cameras captured eye movements on the rim of the glasses, and the fixations were mapped onto a scene video camera coinciding with the participant's line of sight. A binocular 30 Hz sampling rate and up to 0.5° accuracy was combined with a 24 Hz field-

of-view camera. The gaze tracking range was 80° horizontal and 60° vertical. In accordance with the manufacturer's recommendations, a one-point calibration procedure was used. We used children's finger pointing as a cue whereby they were looking at a small screen for calibration: 'touch the red circle with your finger'. The screen was held at arm's length (a 5-inch touchscreen, approximately 50 cm distance). As the children touched the red circle, we knew where they were looking and calibrated the device to that point. For calibration purposes, the device was held slightly downward (a 15–20 degree angle) from eye level, as recommended by the manufacturer. We performed systematic offline calibration (offset correction) to an attractive looming stimulus using the BeGaze® (Version 3.3) software (www.smivision.com) before each trial as the children sometimes moved the glasses after the initial calibration procedure. The correction was performed on the only moving object on the screen if their gaze followed the object and was fixated in close vicinity of it (see Figure 2. for an example game view). Tracking ratios were used as an exclusion criterion: participants with a tracking ratio of < 30% would be excluded (Amso, Haas, & Markant, 2014). The eye area was defined using SMI BeGaze® software, and the analyses were performed using semantic gaze mapping in the BeGaze software. The eye region encompassed 1.2% of the overall screen size (see Figure 3). A cartoon character and images were used to maintain the game-like feature and because these cartoons have been found to elicit similar gaze behavior towards real images in individuals with ASD (Riby et al., 2009). The character's height was 97 cm, with the eyes being 20 cm x 13.2 cm (see Figure 2). We also kept the sclera of the virtual character white and the pupil color dark so as not to reverse eye viewing behavior (Frishchen et al., 2007).



Figure 1a. Example of the game playing using the Kinect technology in which the silhouette of the player is projected in the game via the Kinect sensor

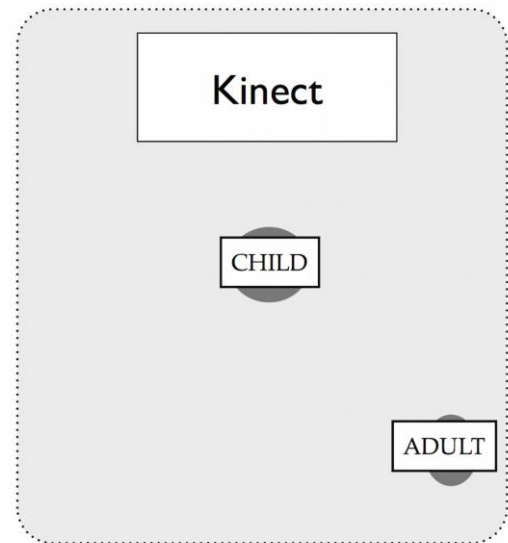


Figure 1b. The setting of the game room: the Kinect sensor and the white screen are in front of the player and an adult /teacher can sit on the background during the game playing

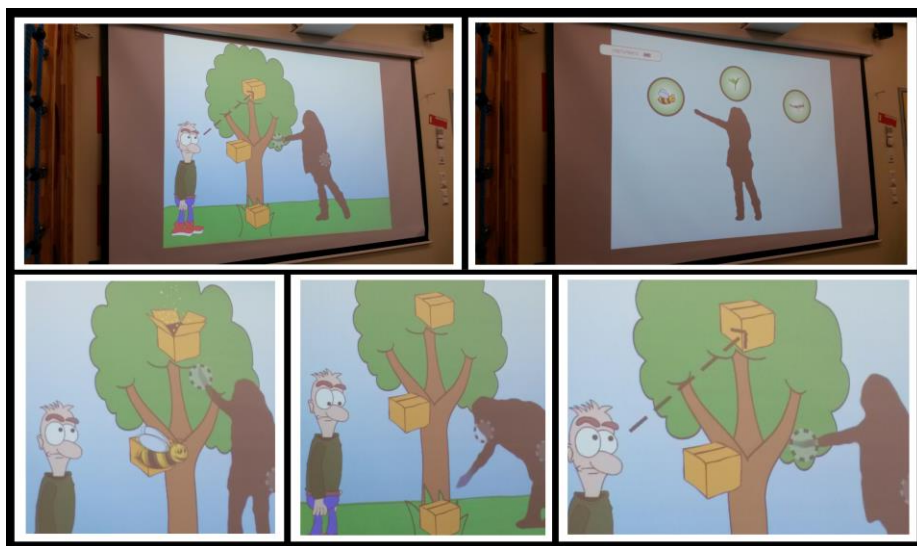


Figure 2. The game view: top left 1) choosing preferred object (bumblebee); top right 2) both eye cue and arrow cue indicating the location (looking at the box on the top); bottom left 3) eye cue and arrow cue to the top box; bottom middle 4) eye cue only (looking at the box on the ground); bottom right 5) The top- most box is open and the participant is trying to catch the bee that flew from the box (can be seen on top of the middle box: bumblebee).

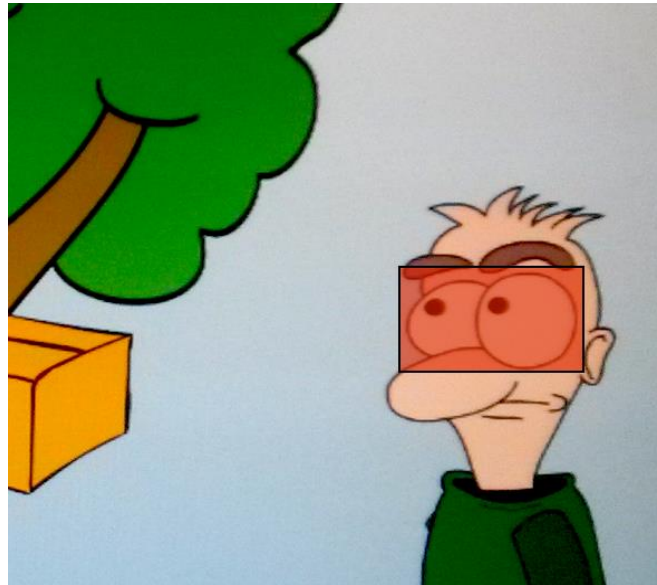


Figure 3. The area of interest (AOI): eye region

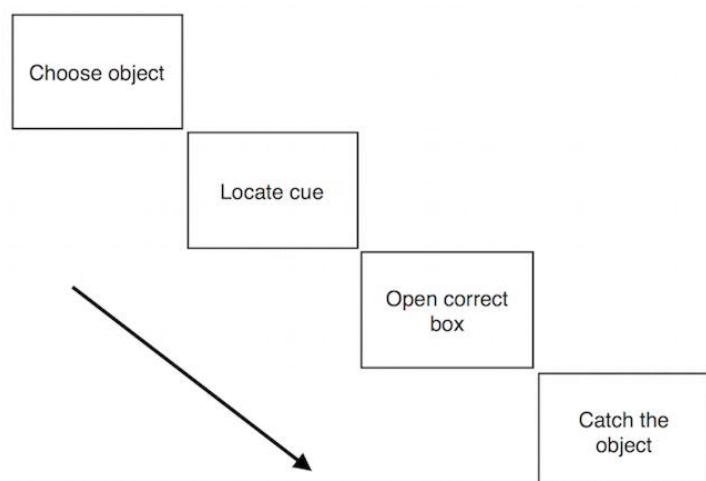


Figure 4. The order of the events in the game: 1) the player chooses an object, which he would like to look for; 2) the player locates the correct box using the eye gaze or arrow cues; 3) the

player opens the correct box; 4) the player catches the object that emerges from the box. After the final trial with either a gaze cue or the double cues, the participant can choose a different object to play the game again.

The task

To produce the least amount of discomfort for the children, the game play was designed by considering existing activities at the participants' school. The format was based on a computer game with a positive user experience (Mäkelä et al., 2013) that was familiar to the children.

Eye contact in the VPT task, a line of sight task, was key to successfully playing the game. The task was similar to the task utilized by Gould et al. (2011), whose original task consisted of pictures on a table in which a person was looking in one of four directions: up, down, left, or right. The children needed to understand where the person was looking and name the object the person was seeing: 'What does s/he see?' The task was also comparable to Baron-Cohen's (1989) line of sight task (that was classified a level 1 VPT by Pearson, Ropar and Hamilton (2013) in their review on VPT), where the participant identifies which object the experimenter was seeing.

Similar to the original game, first participants chose an object of their preference (for example, a bird, a bee, a plane, etc.) by placing a hand on top of the item (see Figure 2); thus, the children were engaged with the game through their own decision-making. Then participants needed to recognize which in direction the virtual character was looking (there were three boxes on the screen: up, down, or middle) and open the box in that location with the help of eye-gaze cues or with eye-gaze and arrow cues (Figure 2; for the order of the events, see Figure 4). If the participants tried to open the incorrect box, it would not open; it would shake for a moment and make a sound inviting them to try again. Three attempts were allowed before the next cue appeared. Once they chose the correct box, the participants needed to catch the flying object emerging from the box.

There were two kinds of trials in the game: 1) only the eye gaze cue indicated which box to choose (hereafter eye cue) and 2) the eye gaze cue and an additional arrow cue simultaneously indicated which box to choose in order to make the task easier (hereafter double cue). The double cue was added to increase the likelihood that the children would not find the task too difficult and not have negative feelings about participating. The idea was based on earlier VPT task results by Gould, Tarbox, Hora, Noone, & Bergtsrom (2011). This research was only interested in seeing how the children performed using only the eye cue. The double cue trials were undertaken to give the children easier trials to ensure more positive than negative experiences of the game (See Korhonen et al., 2016 for details on the children's performance in the double cue trials).

Trials

The data collection began with practice trials for both the TDI and ASD participants. This practice was done because it was not known whether the target behavior was part of the repertoire of children with ASD. Task failure could have evoked negative feelings in the children with ASD thereby resulting in refusals to play and participate in similar activities in the future. The practice trials included two eye cue trials and five double cue trials. The practice measurements involved only two attempts at the eye cue condition to avoid multiple failures, as guided by Morgan and Morgan (2009). Similarly, the trial numbers were kept low (in both the practice and real trials) to keep the playing time short and because of the pilot nature of the study. During the practice trials, the eye cue trials came before the double cue trials to ascertain whether the children could play the game when only eye gaze cues were given: two eye cue trials (length of the arrow: trial 1. = no arrow and trial 2. = no arrow). There was only one attempt for each eye cue trial. After the two eye cue trials, five prompted trials using the fading procedure (number of dashes in the arrow on each trial: trial 1. = 5, trial 2. = 4, trial 3. = 3, trial 4. = 2, trial 5. = 1) with three attempts were used to help players understand the game and provide them with a feeling of control. The TDI children had one practice trial, after which they understood the game (based on their comments).

Following the practice trials, two playing sessions were analyzed; there were six double cue trials and three eye cue trials in order to have more easier trials than difficult trials (the assumption

was that the arrow cues would make the task easier. See Gould et al., 2011). In the double cue trials, the game used a fading procedure in which each successive cue had a shorter arrow until there was no arrow cue. The order followed the fading procedure: the length of the arrow started with 5 dashes, then 4, 3, 2, and finally 1; the three final trials did not have the arrow cue (amount of dashes: 5-4-3-2-1-0-0-0). All the trials allowed three attempts before proceeding to the next trial.

Design.

We were interested in determining for how long, when choosing a correct box in the VPT game during the eye cue condition, they were looking inside the eye area. We only analyzed the eye cue trials, and not the double cue ones, since we were interested in attending to eyes when no support was given. We chose to concentrate on correct trials as there can be multiple reasons for errors. We applied a neuropsychological case-control method in which an individual's data can be statistically compared to those of a control sample (Crawford & Howell, 1998; Crawford et al., 2010). A statistical program (SINGLIM_ES.EXE, <http://homepages.abdn.ac.uk/j.crawford/pages/dept/psychom.htm>) was applied to test whether participants' total dwelling time, calculated automatically by SMI BeGaze®, in the eye area, were significantly lower than those of a control sample. The dependent measure was the dwelling time in the eye area in the eye cue condition.

Procedure

When the children arrived in the game playing room at their school, they were welcomed and then instructed that they needed to first choose a preferred item on the screen and then locate the hiding place of that item. They were then told that the man on the screen would help them find the correct box. The eye-tracking glasses were placed on their heads and taken off by the researchers. When they were finished, the children were thanked for playing the game.

Results

The total dwelling time inside the eye area was counted in milliseconds (ms). The recording began when the virtual character turned its eyes to the box and ended when the participant chose the correct box. Correct choices were seen in the eye-tracking video recordings as well as in the computer log files. For the control group's first trial in the eye cue condition, the correct choice rate was 80.7%, and for the second, it was 86.2%. For the ASD children's first trial in the eye cue condition, the correct choice rate was 67.5%, and for the second, it was 57.1%. The chance of making a correct choice was 33.3%. No child played the game at a chance level. All the children had tracking ratios above the exclusion criteria.

Comparisons of single cases to controls

Statistics appropriate for single case studies (case controls analysis) were used (Crawford, Garthwaite, & Porter, 2010). Case-control analyses were used to compute the means of the total eye area dwelling times for the first two sessions. Data were analyzed for three of the four children participating as the eye tracking data showed the fourth child did not look at the screen during the game playing.

The control group's (N = 16) mean total eye area dwelling time was 561.6 minutes (SD 270.9). As the data was not normally distributed, a LOG10 transformation was applied to the control group and individuals with ASD. Since the children with ASD were all male, which was not the case for the control group, gender differences in the dwelling times were explored. No evidence of gender differences was found in the control group when it was divided into two groups based on gender $t(14) = -0.254, p = 0.803$.

The SINGLIMS_ES.EXE software program was used; individual results are presented in Table 1, as suggested by Crawford, Garthwaite, and Porter (2010). One child (Aaron) spent significantly less time (116.5 minutes, SD = 164) than the controls in the eye area. Two other children (Billy and Derek) did not differ in total dwelling time (375.8 minutes, SD = 109 and 407.6

minutes, $SD = 57$) compared to the control group. For the child with a shorter total dwelling time compared to the controls (Aaron), the effect sizes were large, and only a small percentage of the controls would be expected to show such a score (Table 1).

Table 1. The results of the case-controls analyses using the DISSOCS_ES.EXE (Crawford, Garthwaite & Porter, 2010).

Table 1. Results of the case-control analysis

The asterisk (*) indicates significant difference between controls and the participants in a given task.

Participant	Task (eye cue)	Control sample			Case's score	Significance test (* meets criteria for a deficit compared to controls)		Estimated percentage of the control population obtaining a lower score than the case		Estimated effect size (Z_{cc})	
		N	Mean	SD		t	p	Point	(95% CI)	Point	(95% CI)
Aaron	Correct	16	2.709	0.189	2.07	-3.280	0.003*	0.25	(0.0002 to 1.88)	-3.381	(-4.666 to -2.079)
Billy	Correct	16	2.709	0.189	2.57	-0.713	0.24	24.3	(10.0 to 43.3)	-0.735	(-1.28 to -0.17)
Derek	Correct	16	2.709	0.189	2.61	-0.508	0.31	30.9	(14.9 to 50.3)	-0.524	(-1.040 to 0.008)

Discussion

This study aimed to use a positive game playing environment to extend research in eye-tracking and attending to eyes to high support need and minimally verbal children with ASD. In contrast with group studies, the goal was to examine attention to eyes individually. The analyses were performed individually in order to detect possible individual variations compared to a control group and consider each high support need and minimally verbal child with ASD separately. This study used a computer game with a history of positive user experience to engage the children and lessen the possibility of negative feelings about participating in research. In sum, we wanted to explore do high support need and minimally verbal children with ASD, as individuals, have atypical looking time in the eye area in comparison to typically developing children. To our knowledge this has not been studied before.

It was found that while playing a computer game, in which attending to the eyes of a virtual character is mandatory, we were able to collect eye-tracking data of high support need and minimally verbal children with ASD. The results showed that one child (Aaron) out of three with ASD had a shorter total dwelling time in the eye area compared to the TDI. Billy and Derek did not differ in dwelling time in comparison to the controls and Carl was excluded since no dwelling time data were available (Carl may have used peripheral vision to play the game as his performance was above the chance level). No child with ASD had a longer eye area dwelling time than the control group. The game and the case controls analyses are an appropriate methodology for these children with very different backgrounds and abilities because they were able to play the game voluntarily and independently. Individual analyses of the eye-tracking data for the participants from this group showed expected levels of performance variation.

These findings were on the correct trials which suggest that dwelling time may not be the key element for all individuals in terms of being able to perform successfully in a task that requires attending to eyes. Therefore, because the dwelling time can be shorter, it may be more appropriate for future research to determine the relevance of attention to eyes and dwelling time for each individual separately. The fact that the two ASD children did not differ from the controls in their dwelling time can be an artefact of the game; that is, an enjoyable game that may have engaged the participants more than a live situation that had less motivation and more distractors. However, it is also possible that this is an indication of the individual differences seen in ASD.

Eye-tracking reviews have indicated both intact (Guillon et al., 2014) and impaired fixations on eyes (Papagiannopoulou et al., 2014), both of which were found in the study's participants. In

attention research, some believe that group and individual differences can explain discrepant results in the field (Ames & Fletcher-Watson, 2010; Dereu et al., 2012) and that individuals with ASD have not been taken into consideration in assessment and task procedures (Korhonen et al., 2014). Therefore, this study emphasizes that in some children with ASD, differences may exist even when the children are matched according to mental or language age (Korhonen et al., 2014); individual variation should thus receive greater attention. In the case of high support need and minimally verbal children, individual-level analyses may be the best option since these children show more pronounced heterogeneity in their profiles, making it more difficult to match them with other participant groups (e.g. Burack et al., 2004; Jacobsen, 2010). An individual-level approach could also shed light on the discrepancies found in eye area looking time results in the higher functioning population. The case-control design was found to be useful in understanding how these individuals were able to attend to eyes and to show variation in their performance.

Guillon et al. (2014) believe that the complexity of a social situation might lead to diminished eye gazing, something we should also consider in this study. Complexity can be defined on an individual level and may vary from person to person. Nevertheless, in the present study, the complexity of the situation was adopted from a study in which this particular skill was believed to be impaired (Gould et al., 2011). Therefore, the results regarding the children in this study are not based merely on a lack of complexity. Moreover, complexity by itself would not explain variation when performing the task correctly; it may reflect the individual's perception of the complexity of the task.

This study took several steps to design and utilize a virtual environment for eye-tracking research purposes that was based on positive user experiences of environments seen as specifically challenging for high support need children and those with ASD (e.g., Andersson, Josefsson, & Pareto, 2006; Lányi, Mátrai, & Tarjányi, 2006). This aspect is particularly interesting for future research since individuals with ASD are found to benefit from technology, and computer game production has become increasingly more available, cheap, and commonplace (e.g., Colby, 1973; Grynszpan, Weiss, Perez-Diaz, & Gal, 2013; Parsons, Leonard, & Mitchell, 2006; Wass & Porayska-Pomsta, 2013). The use of activities or technologies in research, which are already preferred by individuals with ASD, could be a relatively easy way of engaging children with high support needs as it may otherwise be difficult to motivate them to participate in tasks. Therefore, it is possible that the design of the task in this study influenced task performance; this aspect should be explored further.

This study had a number of limitations as there were factors whose impact could not be excluded. How a person views the cue cannot be determined. One contention is that whether participants consider the eye cue as social (social reading hypothesis) or geometric shapes (feature correspondence theory) is not important if they use the cue (e.g., Ristic et al., 2005). We also did not attempt to determine what happened when the children made errors as such decisions were sometimes made with or without looking at the eyes. However, since the comparison of correct trials was performed under the same conditions (eye cue) for children with ASD and the control group, the differences observed were not associated with incorrect choices and, hence, have no influence on the interpretation of the data. An analysis of the incorrect trials could lead to conclusions made based on multiple reasons why the errors appeared.

The children were also able to revise their answers when the first guess was incorrect and try again to choose the correct box. This feature may add an element in which the child can try to guess the answer, which could impact the interpretation of the results. However, since both groups had the same possibility, it is believed that this did not affect the results. Furthermore, had this been the case only in children with ASD, it should have appeared as shorter dwelling times compared with the TDI children. Moreover, it would have been ethically difficult not to give this possibility to the children because otherwise, the game would merely concentrate on failure and not be supportive of the player. The question remains as to whether the deficits seen in previous research were based on a true deficit in attention to eyes and motivation or the appropriate use of the cue. What the results

of this study show, however, is that some individuals do use eye cues appropriately, regardless of the dwelling time in the eye area.

The length of the trial was allowed to vary from person to person, but this is seen in free viewing situations where atypical eye attention has been found. Time is also a factor that can skew data as these children may not be engaged with the task for the same time frame, and hence, in the game and research design trial, time was not considered (for time measurements see Korhonen et al., 2016).

The participating children also need to be considered: this study's comparison group was matched by minimal chronological age (matching the control children with the youngest ASD child), which is somewhat weak methodologically. However, since the children with ASD have an adjusted syllabus based on their school performance, the language and mental age of TDI children can be inferred to be much higher than the level of the four children with ASD. Therefore, the difference between TDI children and children with ASD should be more evident, and if no differences between the children can be observed, it cannot be due to matching problems. Conducting research on high support need and minimally verbal children with ASD will continue to encounter this problem in the future. If researchers concentrate on the children's impairments by using tests they are unwilling to take, they are likely to mislabel and group these children erroneously (e.g., as suggested for minimally verbal by Kasari et al., 2013). Similarly, the variety of impairments (e.g., Jacobsen, 2000) and definitions regarding these children (Strnadová et al., 2014; Tager-Flusberg & Kasari, 2013) make the matching procedures for research difficult; thus, there is a need to develop new methodologies to enable further research. Problems with gathering background information or matching individuals with control groups should encourage researchers to explore other means to detect skills or impairments. However, this study could not gather data from one child which shows that this data collection method is not always suitable for all children.

The gender ratio in this study was skewed as all the children with ASD were male. In the general ASD population, while there are more boys than girls, not all are boys (e.g., Fombonne, 2009; Rutherford et al., 2016). The control group was not comparable as the division was a 50/50 split between boys and girls. Since gender differences are not fully understood in ASD, the control sample was kept equally divided between genders. Although no evidence of gender differences among the control group was found, this aspect is an interesting avenue for future studies to explore in greater detail.

Overall, due to the small sample size of children with ASD and considering that only three of the four children could be analyzed, caution should be exercised in generalizing the results. They can be used to indicate the benefits of looking at individual data on top of group data simultaneously. The results also provide justification for exploring individual performance further; for example, by using data from previous group studies and developing, improving, and increasing the use of individual-level designs.

Task definition is also difficult. This study defined the game task as perspective taking because joint attention was not possible, per se; the situation was not interactive, and the player and virtual character did not know what the other person saw nor communicated about their shared attention. However, the task could also be interpreted as nearly declarative or imperative joint attention, where the gaze functions simply to prompt action by the other person. (e.g., Carpenter & Liebal, 2012). One could also consider the task as reflexive gaze following where the person is merely looking at the gazed location based on the eye cue (e.g., Kylliäinen & Hietanen, 2004). We classified the game's line of sight task as level 1 VPT, similar to the review of VPT by Pearson, Ropar, and Hamilton (2013).

Conclusions

This study showed that it is plausible to study attention to eyes of high support need and minimally verbal children by using computer games and eye-tracking methodology. We infer that by using individual-level analyses and utilizing preferred computer games we were able to learn more about these children. The results from high support need and minimally verbal children with ASD suggest

that diminished eye attention may vary per individual. The discrepancies in group studies could be explored further using individual-level analyses such as case-control analyses. More importantly, conducting research in a positive context may be an important factor in the participants' ability to perform well in the task and can be a key element when planning research. However, more extensive and large scale research on using eye-tracking methodology is needed to validate the inferences.

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Appendix A

Descriptions of the children:

Aaron is 9 years old and has an ASSQ score of 23. Aaron has developmental delays and hence has elongated schooling planned. He enjoys school. He is still learning how to dress himself but is making progress, and needs support using a toilet. Aaron has sensory sensitivities which makes cutting hair or doing physical examinations difficult. He appears happy in everyday life but has difficulties in concentrating on tasks. If irritated he may scratch or headbutt. He has good gross motoric skills but needs support and training fine motor skills, e.g. using a pencil/pen. He is often restless in his motor actions. Aaron needs support in outside activities, and in public spaces he needs careful supervision. Aaron needs support and guidance in eating. Aaron can understand clear context related instructions but has trouble with comprehending more abstract concepts. He is able name individual everyday items but cannot use plurals. He can use a picture communication folder for communication with several pictures to form a sentence to ask for something. Aaron cannot produce L, K, R sounds, and J and N sounds only as individual sounds. He can produce some sentences by combining two words, however the intelligibility is often inadequate and he feels irritated when asked for clarification.

Billy is 12 years old and has an ASSQ score of 36. Billy has developmental delays. He communicates with pictures and supportive sign language. Billy's day is organized by using a pictorial calendar. He cannot be left alone without supervision. Billy needs support using a toilet, washing up and brushing his teeth. Billy sometimes uses his mouth to feel new items. He can do puzzles at least up to 25 pieces. He is still in the progress of training to use pens and pencils but can use scissors to cut paper into triangular shapes. He gets easily frustrated if there is no planned activity. Billy can understand clear short instructions

Carl is 14 years old and has an ASSQ score of 41. Clark has developmental delays and has therefore elongated schooling planned. Clark takes very little contact with others and gets distracted easily and falls to his own thoughts. With verbal guidance he is easily brought back to the task. He may grab hair or pinch from seconds to up to minutes without a specific reason. When disappointed the time is often longer. His motor skills are monotonous but he likes physiotherapy in which he needs verbal and manual support and guidance. His fine motor abilities need training; using a pencil or scissors is difficult. Clark's activity level is very varied; sometimes he needs constant guidance and often the tasks get done without support. He uses words to communicate, and does not use signs or pictures. He can write his own name and can recall most numbers. Clark can name geometric shapes (square, circle, house, heart). Clark has echolalic speech and often recites sentences from cartoons.

Derek is 11 years old and has an ASSQ score of 30. Derek is almost always a cheerful child. He has made progress in play and does not only do certain play activities. He is currently more willing to be guided by an adult. When stuck, giving time and showing pictures help him to move one. He is eager to play but still for only a short while, and needs adult supervision and guidance to plan and execute activities. In motor play activities Derek is shy. Fine motor skills, e.g. holding a pen, is in the process of learning. Derek has started to train to do simple addition and subtraction math with tangible items. Big social events at the school are a challenge for Derek that can be addressed by encouragement and pictorial planning of the events. Derek communicates with words, gestures and pointing. Derek uses the same phrases frequently, with 1-3 words. He can name colors, numbers and play related items. He can ask for help by using words such as *help* or *give*. He also uses picture communication file to communicate with adults.