SPECIAL EDUCATION TEACHERS' KNOWLEDGE AND USE OF ASSISTIVE TECHNOLOGY WITH STUDENTS WITH EXPRESSIVE LANGUAGE DISORDERS IN SAUDI ARABIA

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DEDICATION

First and foremost, this work is dedicated to my family. In 1987, my father, **Ahmed**, dropped school and accompanied me in a trip to receive medical treatment and undergo a surgery, which deprived him the opportunity to pursue education and get promoted in his military career. Now, in 2020, I proudly dedicate this work to him in acknowledgment of his sacrifice and as a humble compensation for the opportunity he wasted. This is further dedicated: to my mother, **Nourah**, for without her endless love and encouragement I would never have been able to complete my studies and achieve this success; to my brothers and sisters: **Mohammed**, **Saeed**, **Nasser**, **Zahraa**, and **Saleha**, whose continued support has been a reason for pursuing my education and a motive for this accomplishment; to my Saudi expat colleagues and American friends, who were my family while in the United States of America, and last but not least, to the special education sector in the Kingdom of Saudi Arabia and those who are devoted to advocating the rights of people with special needs.

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CHAPTER 1: INTRODUCTION

Teachers' knowledge and use of assistive technology (AT) for students with disabilities is an important topic in the field of education (Alkahtani, 2013). AT is "any item, piece of equipment, or teacher made product that is designed to improve a student's functional capacity or help a student succeed in accessing the general education curriculum" (Akpan & Beard, 2014, p. 219). Successful implementation of AT could determine if students with disabilities will learn successfully or fail to learn, which could be measured by students' academic achievements, retention, and grade advancement (Santos et al., 2019). However, research has found teachers have inadequate knowledge on how to use AT in the classroom for their students with disabilities (Alkahtani, 2013). It is imperative both general education teachers and special education teachers are knowledgeable of how to use AT in the classroom (Alkahtani, 2013).

Universal Design (UD) justified the need for this research. Universal design has been defined as "the design of products and environments to be usable by all people, to the greatest extent" (Burgstahler, 2004, p. 2). Universal Design asserts the primary goal of education is to empower the learner (Alkahtani, 2013). Therefore, both UD and AT are student focused. Universal Design for Learning (UDL) suggests all students should have equal learning opportunities through alternate means, despite their abilities (Rose & Meyer, 2002). AT is one of the alternate means that can enable students with disabilities to have equal learning opportunities (Burgstahler, 2004). The AT continuum includes low-tech, mid-tech, and high-tech devices (Akpan & Beard, 2014; Ganschow et al., 2001).

AT devices vary based on need. Low-tech AT devices are typically not technological or expensive and do often do not require training (Basham & Marino, 2013). Examples of such devices include pencil grips, highlighters, and adapted furniture (Alkahtani, 2013). Mid-tech devices are often electronic, although they are not difficult to use and require minimal

training. Alkahtani (2013) proposed mid-tech devices can include adapted keyboards, electronic dictionaries, digital recorders. High-tech devices are often expensive (Basham & Marino, 2013). They are often highly electronic devices with micro-computer components, which require extensive training, including "word prediction software, talking calculators, and hearing aid and/or assistive listening devices" (Alkahtani, 2013, p. 68). Low, mid, and high-tech AT devices can assist with equalizing all students' access to learning. It is important students with communication disorders have assistive technology devices that can specifically assist with their needs. Augmentative and alternative communication (or AAC) devices are AT devices designed for students with specific communication needs (Fonte & Boesch, 2016).

AT devices can assist students with disabilities, including expressive language disorders. Expressive language disorders often present with speech and vocabulary difficulties, word finding challenges, vocabulary errors, challenges with the formation of grammatical structures and sentences, atypical word order, and omission of integral parts of sentences (Willinger et. al., 2003). It is common for expressive language disorders to co-exist with other disabilities (Alexander & Loverso, 1992; Carr & Durand, 1985; Crary, 1984; Nikopoulos et al., 2013). Often when expressive language disorders exist with other disabilities, there are challenges with both the spoken and written language (Conrad, 1979; Harris & Terlektsi, 2011).

This dissertation focused on teacher knowledge and the use of AT for students with expressive language disorders. The background of AT is provided as well as the statement of problem and rationale for the study. The purpose for this research is also discussed.

Furthermore, this chapter presents the research design, the variables, research questions, and the hypotheses. This chapter includes the conceptual and theoretical

framework, key concepts, and a definition of terms. Finally, a summary of this chapter is included.

Background

There are numerous definitions of assistive technology (AT). Kniskern et al. (2008) defined AT services as "any service that directly assists an individual with a disability in the selection, acquisition, or use of assistive technology device" (p. 60). Akpan and Beard (2014) defined AT as "any item, piece of equipment, or teacher made product that is designed to improve a student's functional capability or help a student succeed in accessing the general education curriculum" (p. 219). Lee and Templeton (as cited in Ogirima et al., 2017) defined AT as a piece of equipment of product system that can be acquired off the shelf or modified to help individuals with functional capacities. This tool facilitates independent functioning and enables students with communication disorders to accomplish tasks they otherwise may not be able to accomplish.

In the United States (US) AT was not prioritized until the reauthorization of the Individuals with Disabilities Education Act (IDEA, 2004) in 1997, which mandated AT must be considered when generating Individualized Education Plans (IEPs) for students with disabilities (Edyburn, 2000). Legislation for students with disabilities has evolved tremendously in the US, as students with disabilities were educated at home prior to 1961 (Hossain, 2012). The Education for All Handicapped Children Act (EAHCA) of 1975 became IDEA in 1990 and then was reauthorized in 1997 (Hossain, 2012). It was again reauthorized in 2004 and became the Individuals with Disabilities Education Act of 2004 (Aldabas, 2015).

The Regulations of Special Education Programs and Institutes (RSEPI) is the legislation that exists for students with disabilities in Saudi Arabia (Alquraini, 2011). RSEPI was modeled after the Education for All Handicapped Children Act (EHA) of 1975 and

IDEA (Alquraini, 2011). However, AT is not included as an important service for students with disabilities, and there is no explanation of the requirements of AT in RSEPI (Alquraini, 2013). Alquraini (2013) insisted there is a need for clear guidelines regarding AT within RSEPI. Advancements in technology have generated the need for best practices about assistive technology and its uses for students with disabilities (Woodward & Reith, 1997).

Statement of Problem

There are students with disabilities currently not receiving the optimal effects of assistive technology (AT) due to implementation challenges (Ogirima et al., 2017). Some scholars have found there is a lack of competence in knowledge of the implementation of AT by special education teachers (Ogirima et al., 2017). Teachers' lack of knowledge is a major hindrance to the use of AT (Alkahtani, 2013). Inadequate knowledge by teachers is one of the primary barriers to the effective implementation of AT. This may be the result of insufficient training on AT (Baush & Ault, 2008). Teacher training should include uses of AT with practical applications. Alkahtani (2013) found teachers preferred face to face training methods that included hands on and practical training.

There is research on the use of AT for students with disabilities around the world (Cook & Polgar, 2014; Erdem, 2017). This indicates this is a global problem with a need for research internationally. There is a need for teacher training to ensure teachers have the necessary skills and knowledge to properly use AT for students with communication disorders (Alfaraj & Kuyini, 2014; Ogirima et al., 2017).

Students with disabilities need to obtain skills to aide them in independent living, and AT can help them to attain these skills (Gustafson, 2006). For example, hearing aids and assistive listening devices are examples of AT for students with communication disorders (Alkahtani, 2013). Regulations of Special Education Programs and Institutes (RSEPI), the Special Education mandate in Saudi Arabia, was modeled after Individual with Disabilities

Education Act (IDEA) of 1990 (Alquraini, 2011). IDEA mandated AT be included in the Individualized Education Plans (IEPs) of students with disabilities (Poel et al., 2013). Additionally, the National Council for Accreditation of Teacher Education (NCATE) and the Council for Exceptional Children (CEC) included the use of AT in their guiding recommendations (Poel et al., 2013).

Rationale for the Study

With the necessary knowledge and training on AT, teachers may be able to enhance the educational process for students with disabilities (Ogirima et al., 2017). Therefore, it was important to understand what knowledge of AT teachers possess and how they are using AT to better comprehend how they can improve their use of AT. The findings from this study can help educators and administrators better understand the training necessary to effectively implement AT for students with expressive language disorders. The results from this study can benefit educational stakeholders in Saudi Arabia, as well as the Ministry of Education. These findings can enhance teacher training and professional development both during teachers' initial university training and after graduation during continuing education.

The Purpose of Study

The purpose of the study was to investigate the knowledge and use of assistive technology (AT) of special education teachers of students with expressive language disorders in Saudi Arabia.

Research Design

This research used a quantitative design, a descriptive and inferential survey research design. A non-experimental cross-sectional research survey was utilized to generate data that could be statistically quantified. This enabled the researcher to quantify the variables and attitudes of the participants to help generalize the results to a larger population (DeFranzo, 2011).

The researcher used descriptive techniques for the methodology because descriptive techniques helped the researcher describe attitudes in the field of special education. A descriptive method helped the researcher study attitudes about a certain practice or trend. Surveys are often the preferred research method in descriptive research for special education because they enable the researcher to measure the variables and condition of the variables (Rumrill et al., 2011). Anonymity is another benefit to the survey method because respondents are able to express their views and feelings without worrying about their identity being exposed (Cohen et al., 2004).

This quantitative research used a two-part instrument to assess special education teachers' knowledge and use of assistive technology (AT) for students with expressive language disorders in Saudi Arabia. The adapted survey from the tools created by Alharbi (2018), and general information questionnaire was used as the instrument employed by the researcher. The instrumentation employed was useful for this research because the survey sought to gain knowledge about teachers' knowledge and use of AT. The survey used a Likert scale and asked teachers about their knowledge and level of use of AT for students with expressive language disorders.

The researcher identified variables of the research. The researcher used descriptive statistics to analyze data and obtain correct findings to answer the first and third research questions. The researcher used a non-parametric technique instead of parametric technique to report participants' responses about their knowledge and use of AT for question two and four based on their age, gender, level of education, years of experience, and the type of disability. To assess those research questions, the researcher sought to conduct a five-way Factorial ANOVA, but upon testing the assumptions, the researcher determined that a nonparametric test was necessary because the assumption of normality was violated when assessed for each independent variable. A log transformation was performed, but the data still did not have a

normal distribution. In addition, Levene's test was violated, $p<.001$ and the groups contained unequal sample sizes. Therefore, the researcher conducted a Kruskal Wallis *H* test (Chan & Walmsley, 1997) to assess for differences when comparing four of the independent variables. The independent variables were age, level of education, years of experience, and students' types of disabilities. In addition, a Mann-Whitney *U* test (Field, 2000) assessed for differences attributable to gender because there were two groups.

Variables of the Study

This study examined two dependent variables and five independent variables.

Dependent Variables

DV (1): The first dependent variable was teachers' knowledge of AT for students with expressive language disorders.

DV (2): The second dependent variable was teachers' use of AT in their classroom for students with expressive language disorders.

Independent Variables

IV(1): Age- The age of the teachers of the students with expressive language disorders. Thomas and Stratton (2006) found age can affect teachers' competence toward technology.

IV(2): Gender- This refered to whether the special education teacher is male or female. Research has suggested gender can impact teachers' use of AT (Thomas & Stratton, 2006).

IV(3): Level of education of special education teachers- This refered to the degree held by the special education teacher. Thomas and Stratton (2006) found teachers' level of education affects their ability to use technology.

IV(4): Years of experience- This refered to the number of years the teacher of students with expressive language disorders has been teaching. Teachers' years of

experience have been found to affect their outcomes in the classroom (Yusuf & Dada, 2016).

IV(5): Types of disabilities- This refered to the types of disabilities the educators teach. Alharbi (2018) suggested the type of disabilities of the students may impact teachers' use of AT.

Research Questions

The primary research questions that directed this study are as follows.

Research Question 1: What are special education teachers' knowledge levels regarding assistive technology usage in teaching their students with expressive language disorders?

Research Question 2: What are the differences in special education teachers' knowledge levels of assistive technology based on their age, gender, level of education, years of experience, and their students' types of disabilities for educating students with expressive language disorders?

Research Question 3: What are special education teachers' levels of use of assistive technology in teaching their students with expressive language disorders?

Research Question 4: What are the differences in special education teachers' level of use of assistive technology based on their age, gender, level of education, years of experience, and their students' types of disabilities, for educating students with expressive language disorders?

Research Hypotheses

Null (H0) and Alternative (H1) Hypotheses

H0: There is no statistically significant difference in teachers' knowledge of AT based on their age.

H1: There is a statistically significant difference in teachers' knowledge of AT based

on their age.

H0: There is no statistically significant difference in teachers' knowledge of AT based on their gender.

H1: There is a statistically significant difference in teachers' knowledge of AT based on their gender.

H0: There is no statistically significant difference in teachers' knowledge of AT based on their level of education.

H1: There is a statistically significant difference in teachers' knowledge of AT based on their level of education.

H0: There is no statistically significant difference in teachers' knowledge of AT based on years of experience.

H1: There is a statistically significant difference in teachers' knowledge of AT based on years of experience.

H0: There is no statistically significant difference in teachers' knowledge of AT based on the types of disabilities of their students.

H1: There is a statistically significant difference in teachers' knowledge of AT based on the types of disabilities of their students.

H0: There is no statistically significant difference in teachers' use of AT based on their age.

H1: There is a statistically significant difference in teachers' use of AT based on their age.

H0: There is no statistically significant difference in teachers' use of AT based on their gender.

H1: There is a statistically significant difference in teachers' use of AT based on their gender.

H0: There is no statistically significant difference in teachers' use of AT based on their level