Assignment 3:

Qualitative Research Study

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Introduction

According to the NAEYC and the Fred Rogers Center, the deliberate and developmentally appropriate use of technology and interactive media by teachers of preschool students are pathways to learning and development when they are used intentionally (NAEYC, 2009). In a 2014 survey on technology trends, usage and professional development in early childhood programs, most of the technology use reported covered computers, tablets, TV/DVDs, digitals cameras, and interactive whiteboards (Blackwell, Wartella, Lauricella, & Robb, 2015). Teacher perception and usage of robotics are not included in the survey.

Studies involving the use of robot assistants in the treatment of children with Autism Spectrum Disorder (ASD) has gradually increased since 1999 due to their simplistic interactions, predictable behavior, and controlled social situations (Aresti-Bartolome & Garcia-Zapirain, 2014). "The engaging, predictable and safe nature of robots suggests that robots could be a useful tool for teachers in special education especially when working with children with profound and multiple disabilities" (Hedgecock, Standen, Beer, Brown, & S. Stewart, 2014, p. 112). In a study conducted by Fridin (2014), results showed that through storytelling, a robot can assist the teacher in "facilitating a process of constructive learning" and "teaching of new concepts and motor skills (p. 60).

While the use of robotics in STEM education is has shown an increase in creativity, critical thinking and collaboration in primary and secondary students (Khanlari, 2013), few studies have been conducted on their implementation in the preschool classrooms. Additionally, the researcher is unaware of any existing research on humanoid robot assistants and the preschool disabled population.

With the lack of teacher training on the use of robotics in early childhood classrooms and the absence of research on their use in preschool disabled classrooms, this study will examine student engagement and teacher perceptions of developmentally appropriate implementation.

Statement of the Problem

While there is a growing number of studies on the use of humanoid robots and students classified as Autistic, few focus on using robots to increase engagement in students with other cognitive disabilities, especially in preschool-aged children. Many of these studies have taken place outside of the United States, and there is a significant lack of research pertaining to teacher perceptions of the use of humanoid robots with student classified as preschool disabled.

Purpose of the Study

The purpose of this study is to investigate if the use of a humanoid robot assistant will increase student engagement in students classified as preschool disabled. Teacher perception of robotics in the preschool disabled classroom will also be analyzed. The results of this study should contribute to the understanding of how humanoid robots can be incorporated into preschool disabled classrooms to increase student engagement.

Theoretical Framework

The educational theories of Constructionism and constructivism, which are based on student-centered discovery utilizing prior knowledge and focuses on the belief that students need to be immersed in hands-on, real-world learning activities are the underlying theoretical frameworks of this study (Educational Robotics and Constructionism, 2016). Based on these

frameworks, the researcher will explore the level of engagement in students classified as preschool disabled when accompanied by a humanoid robot assistant.

Research Questions

- Do students who have been classified as a preschool child with a disability show increased engagement when interacting with a Humanoid Robot during lessons?

Sub-Questions

- What are teacher's views on robotics use with preschool disabled students?

- Do teachers find value in the use of robotics in classrooms?

- Do teachers feel they have enough support and training for successful implementation of robotics?

Significance of the Study

Several studies have been conducted on the use of Humanoid Robots with children classified as Autistic, but there has been no research on the use of the Humanoid Robots and preschool disabled population. With the focus on both technology and early childhood, this study will help teachers of young children with disabilities develop activities and projects that will involve children in active learning and encourages them to use higher-level thinking skills. This study is significant in that it will add to the literature concerning the use of humanoid robots and student engagement in children classified as preschool disabled. It will also attempt to explain the relationship between robotics use and teachers perception of robotics within the preschool disabled classroom.

Develop a Statement of Resources

The primary sources used in this research project will be the data collected during interviews with classroom teachers and the observation of interactions between the robots and the students in a classroom setting. Secondary sources will be identified in reviewing the literature for this study. The researcher will focus on three key topics which will attempt to synthesize previous research and contribute to the overall structure of the study. Previous studies involving using humanoid robots with Autistic children will focus on Human-robot interaction, an increase in communication and the use of robotics in therapy sessions. The literature review will also attempt to look at how robotics have been used to support children with multiple disabilities. Finally, the researcher will investigate how technology has been previously used with preschool aged children. Keywords will include: technology and preschool, disabilities, robotics, skill acquisition, humanoid robots and NAO.

Methodology

Philosophical Framework

The worldview a researcher adopts influences the research method used in a study (Creswell, 2014). For this qualitative study, a Constructivist philosophical framework will be used. Through this philosophical lens, the researcher seeks to construct meaning from the interactions and observations of the participants by carefully interpreting the data collected (Creswell, 2014, p. 8). Through open-ended questions and classroom observations, the researcher will attempt to make sense of the historical and cultural climate of preschool disabled classrooms.

Research Approach and Design The researcher will seek to find significance in the views and experiences of the participants.

For this qualitative study, the researcher will use an exploratory case study design. Yin (2013) states that case studies are used when the researcher is exploring the "how" and "why" of a particular question. Through observation and interviews, the researcher will attempt to discover the "how" and "why" of teacher perception and student engagement with the use of robotics in preschool disabled classrooms in New Jersey.

Research Method

In this study, the researcher will observe teacher use and non-use of robotics during a classroom activity to measure student engagement. The researcher will also interview teachers to ascertain their perception of robotics use in a preschool disabled setting.

Field notes will be written during the observation phase of the study while open-ended questioning of participating teachers will be used to establish teacher perception.

Qualitative computer data analysis programs or hand coding will be used to interpret the meaning of the data collected through observation and interview. Implications and limitations of the research as well as recommendations for further study will be discussed.

References

Aresti-Bartolome, N., & Garcia-Zapirain, B. (2014). Technologies as support tools for persons with autistic spectrum disorder: A systematic review. *International Journal of Environmental Research and Public Health, 11*(8), 7767-802.

Blackwell, C. K., Wartella, E., Lauricella, A. R., & Robb, M. B. (2015). *Technology in the lives of educators and early childhood programs; trends in access, use, and professional development from 2012 to 2014.* Latrobe, PA: The Fred Rogers Center for Early Learning and Media at Saint Vincent College.

Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th. ed.). Thousand Oaks, CA: Sage.

Educational Robotics and Constructionism (Papert). (2016, April 11). Retrieved from: http://www.learning-theories.com/educational-robotics-and-constructionism.html

Fridin, M. (2014). Storytelling by a kindergarten social assistive robot: A tool for constructive learning in preschool education. *Computers & Education, 70*, 53-64. doi:10.1016/j.compedu.2013.07.043

Hedgecock, J., Standen, P. J., Beer, C., Brown, D., & S. Stewart, D. (2014). Evaluating the role of a humanoid robot to support learning in children with profound and multiple disabilities. *Journal of Assistive Technologies, 8*(3), 111.

Khanlari, A. (2013). Effects of robotics on 21st century skills. *European Scientific Journal, 9*(27), 26.

National Association for the Education of Young Children (2009). Developmentally appropriate

　　　Practice in early childhood programs serving children from birth through Age 8. Retrieved

　　　from the NAEYC March 16, 2016 from

　　　http://www.naeyc.org/files/naeyc/file/positions/PSDAP.pdf

Yin, R. K. (2013). *Case study research: Design and methods*: Thousand Oaks, CA: Sage