

Project 4:

Robot Skills and Cognitive Performance of Preschool Disabled Children

Proposal with Survey Instrument and IRB

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PROJECT PROPOSAL

Introduction and Need for the Study

With the recent focus on STEM activities for young children, new technology best practices and curriculum standards have been established for early learners (Bers, Flannery, Kazakoff, & Sullivan, 2013). When used intentionally in developmentally appropriate ways, technology can become a conduit to learning and development of preschool aged children (NAEYC, 2009).

There is a growing number of studies on the use of humanoid robots and students classified as Autistic to increase socially acceptable behavior and eye contact (Aresti-Bartolome & Garcia-Zapirain, 2014; Hedgecock, Standen, Beer, Brown, & S. Stewart, 2014). Fridin (2014), concluded 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). However, the researcher found few studies which focus on using robots to increase engagement, time-on-task or skill acquisition in students with other cognitive disabilities, especially in preschool-aged children.

While the use of robotics with primary and secondary students in STEM education has shown an increase in collaboration, creativity, and critical thinking (Khanlari, 2013), there is a lack of research focused on implementing robotics in preschool classrooms. Additionally, the researcher is unaware of any existing research on the use of robotics 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 (Blackwell, Wartella,

Laicella, & Robb, 2015), this study will examine teacher perceptions and use of developmentally appropriate robotics implementation and student engagement.

This qualitative case study will contribute to the body of knowledge needed to address the use of robotics to increase engagement, time-on-task and skill acquisition in students classified as preschool disabled. Its purpose is to evaluate teacher knowledge, experiences and perceptions of the use of robotics to increase skill acquisition, engagement, and time-on-task for students classified as preschool disabled in an inclusive classroom setting. The results of this study should contribute to the understanding of how robotics can be incorporated into preschool disabled classrooms to increase skill acquisition, time-on-task, and student engagement.

Methodology

Qualitative Research 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 question, is studying a present-day issue and when the researcher does not have control over the results. Collecting data in multiple forms and spending a significant length of time gathering data in the “natural setting” are characteristics of a qualitative study (Creswell, 2014, p. 190). Through Qualtrics online open-ended surveys and field notes collected during the semi-structured observation phase, the researcher will attempt to discover if teachers perceive robots to increase student engagement, time-on-task, and learning in students classified as preschool disabled. As per Gray (2009), “Observation involves the systematic viewing of people’s actions and recording, analysis, and interpretation of their behavior” (p. 397). 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 framework of this study (Educational Robotics and Constructionism, 2016). Based on these frameworks, the researcher will explore teacher perceptions on the level of engagement, time-on-task and learning in students classified as preschool disabled when accompanied by robotics. Through online Qualtrics open-ended survey questions and non-participant semi-structured observations, the researcher will attempt to make sense of the use of robotics in preschool disabled classrooms.

Research Questions

- How is robotics implemented by teachers who educate students classified as preschool disabled in a self-contained setting?
 - Sub question 1: Do teachers find value in the use of robotics?
 - Sub question 2: To what extent are teachers of students classified as preschool disabled using robotics for engagement, time-on-task and skill acquisition?
 - Sub question 3: Do teachers feel they have enough support and training for successful implementation of robotics?
- What do teachers of students classified as preschool disabled perceive as constraints that affect robotics implementation?
 - Sub question: What are the factors that influence robotics use in preschool disabled classrooms?

Population and Sampling

Teachers of students classified as preschool disabled will be asked to participate in this study. A convenience sample of four preschool disabled teachers working in a self-contained setting in the researcher's school will be selected. The researcher will contact the principal of the school for permission to conduct the study with the four preschool teachers. The researcher will then send an email to each teacher asking them if they would like to participate in the observation and survey. After consent, a link to the online Qualtrics pre-survey will be emailed to the consenting participants. The number of participants will be dependent on the number of teachers in the program who consent to complete the surveys and the observation. Potential issues include too few participants willing to participate.

INSTRUMENT

Study Instrument

In this study, the researcher will distribute both a pre-and post-open-ended surveys to teachers of students who have been classified as preschool disabled after obtaining permission from the building Principal. The questions for this survey were developed by the researcher based on the research questions of the study. The pre-survey will provide the researcher with background information on the teacher and on the lesson that the researcher will observe. The post-survey will attempt to elicit responses on their use and non-use of robotics during classroom activities to measure student engagement and learning.

Pre-Survey Questions

1. How many years have you been teaching preschool disabled students?
2. Tell me about your background in implementing robotics into your lessons.
3. What type of professional development did you receive for implementing robotics within your lessons?
4. Do you feel that you receive enough support for successful implementation? Why or why not?
5. How do you implement robotics into your lessons?
6. How often do you integrate robotics into your lessons? Daily, weekly?
7. What subject or subjects will be observed and what robots will be utilized?
8. What are the goals and objectives of the lesson?
9. Please describe what activity will be completed with the use of robotics and how it was chosen.

Post-Survey Questions

1. How do you feel the students received this lesson? What would you change about the lesson the next time it is presented to the students? Why?
2. Do you find value in the use of robotics with your students? Why or why not?
3. How long have your students been working with robotics?
4. Has this lesson been taught previously without the use of robotics? If so, did you see a difference?
5. Please explain how you measure engagement, time-on-task, and skill acquisition with your students.
6. Do you feel that the use of robotics during lessons increases engagement, time-on-task, and skill acquisition with your students? Why or why not?
7. What do you feel are the constraints that affect the implementation of robotics in your classroom? Why?
8. What are the factors that influence robotics use in preschool disabled classrooms?

Link to Pre-Survey: https://njcu.co1.qualtrics.com/SE/?SID=SV_es0QiIbgKo8eZFj

Link to Post-Survey: https://njcu.co1.qualtrics.com/SE/?SID=SV_0pjinag1ehEJgX3

IRB
NEW JERSEY CITY UNIVERSITY
INSTITUTIONAL REVIEW BOARD

File # _____

APPLICATION FOR REVIEW OF RESEARCH

1. TYPE OF APPROVAL REVIEW REQUESTED (CHECK ONE):

FULL REVIEW EXPEDITED EXEMPT REVIEW

2. PRINCIPAL INVESTIGATOR: Stephanie Talalai

DEPARTMENT: Educational Technology

PHONE: 732-672-7208

TITLE OF RESEARCH:

Robot Skills and Cognitive Performance of Preschool Disabled Children

CO-INVESTIGATORS:

3. PURPOSE OF RESEARCH (INDEPENDENT PROJECT, MASTER’S THESIS, AND COURSE WHICH INCLUDES COURSE TITLE, SEMESTER AND INSTRUCTOR’S NAME.) ETC.

The purpose of this research is for a dissertation which will be submitted in partial fulfillment of the requirements for the degree of Doctor of Educational Technology Leadership. Course Title: EDTC 809 Assessment and Evaluation (Fall 2016).

4. IF YOU ARE A STUDENT RESEARCHER, PLEASE PROVIDE THE FOLLOWING:

MAILING ADDRESS: 9 Morton Avenue

CITY/STATE/ZIP: Monroe Township, New Jersey 08831

TELEPHONE: 732-672-7208 EMAIL: stalalai@njcu.edu

FACULTY SPONSOR NAME: Dr. Christopher Carnahan

DEPARTMENT OF SPONSORING FACULTY: Educational Technology

EXT. 3078 FAX: EMAIL: ccarnahan@njcu.edu

FACULTY SPONSOR SIGNATURE: _____

DATE: _____

5. HAS THE RESEARCH PROJECT BEEN CONSIDERED PREVIOUSLY BY THE IRB?

YES NO

IF YES, GIVE LAST APPROVAL DATE: _____

6. SOURCE OF FUNDING (IF APPLICABLE):

UNIVERSITY GRANTS: PLEASE INDICATE WHICH GRANT PROGRAM:
(FOUNDATION, SBR)

EXTRAMURAL FUNDS: PLEASE INDICATE AGENCY NAME:

TITLE:

AWARD NUMBER:

DATE:

7. ARE YOU WORKING WITH A RESEARCHER FROM ANOTHER INSTITUTION?
IF SO, BE AWARE THAT YOUR CO-INVESTIGATOR MUST ALSO SUBMIT YOUR
JOINT PROPOSAL TO THE IRB AT THE INSTITUTION THAT EMPLOYEES
HIM/HER. YES NO

8. WHAT IS THE OBJECTIVE OF THE RESEARCH?

To determine if the use of robotics with students classified as preschool disabled students will increase their school readiness skills and cognitive performance.

9. DOES YOUR RESEARCH INVOLVE ANY OF THE FOLLOWING
(CHECK ALL THAT APPLY)?

MINORS

PRISONERS

PREGNANT WOMEN

USE OF THE INVESTIGATORS' CURRENT STUDENTS AS SUBJECTS

DRUGS OR OTHER CONTROLLED SUBSTANCES

PSYCHOLOGICAL OR PHYSIOLOGICAL STRESS ABOVE THE LEVEL OF
NORMAL EVERYDAY ACTIVITIES

MISLEADING OR DECEIVING SUBJECTS ABOUT ANY ASPECT OR PURPOSE
OF THE RESEARCH

COLLECTION OF INFORMATION WHICH DEALS WITH SENSITIVE ASPECTS
OF THE PARTICIPANTS' BEHAVIOR (ILLEGAL ACTIVITY, DRUG OR
ALCOHOL USE, SEXUAL BEHAVIOR, ETC.)

- COLLECTION OF INFORMATION WHICH WOULD PLACE SUBJECTS AT RISK OF CRIMINAL OR CIVIL LIABILITY IF IT BECAME KNOWN
- COLLECTION OF INFORMATION WHICH COULD AFFECT SUBJECTS' FINANCIAL STANDING, EMPLOYABILITY, OR REPUTATION
- EXAMINATION OF EXISTING DATA, RECORDS, DOCUMENTS, OR SPECIMENS THAT ARE NOT PART OF THE PUBLIC RECORD
- CHILDREN INVOLVED IN YOUR RESEARCH WITHOUT SENSITIVE INFORMATION ABOUT THEMSELVES OR THEIR FAMILIES.
- COLLECTING OR STUDYING EXISTING DATA, DOCUMENTS, RECORDS, PATHOLOGICAL SPECIMENS OR DIAGNOSTIC SPECIMENS WHICH ARE PUBLICLY AVAILABLE AND FROM WHICH PARTICIPANTS CANNOT BE IDENTIFIED BY ANYONE OTHER THAN THE INVESTIGATOR(S).

**IF ANY OF THE ABOVE ITEMS ARE CHECKED
YOUR PROPOSAL DOES NOT QUALIFY FOR AN EXEMPT REVIEW**

10. DESCRIBE THE DESIGN OF THE RESEARCH INCLUDING WHAT WILL BE REQUIRED OF SUBJECTS (ATTACH ADDITIONAL SHEET IF NECESSARY):

Classroom teachers will be asked to complete an online Qualtrics pre-survey to obtain background information; the researcher will then be a non-participant observer and take field notes during several sessions where robotics are being used during lessons. The classroom teachers will then be asked to complete an online Qualtrics post-survey about their lesson.

11. UNDER WHICH OF THE FOLLOWING CATEGORIES ARE YOU APPLYING FOR EXEMPTION?

- RESEARCH CONDUCTED IN ESTABLISHED OR COMMONLY ACCEPTED EDUCATIONAL SETTINGS, INVOLVING NORMAL EDUCATIONAL PRACTICES, SUCH AS (I) RESEARCH ON REGULAR AND SPECIAL EDUCATION INSTRUCTIONAL STRATEGIES, OR (II) RESEARCH ON THE EFFECTIVENESS OF THE COMPARISON AMONG INSTRUCTIONAL TECHNIQUES, CURRICULA, OR CLASSROOM MANAGEMENT METHODS.
- RESEARCH INVOLVING THE USE OF SOCIAL SCIENCE OR EDUCATIONAL TESTS (COGNITIVE, DIAGNOSTIC, APTITUDE, ACHIEVEMENT), SURVEY PROCEDURES, INTERVIEW PROCEDURES, OR OBSERVATION OF PUBLIC BEHAVIOR UNLESS (I) INFORMATION IS OBTAINED IN SUCH A WAY AS THAT THE PARTICIPANTS CAN BE IDENTIFIED DIRECTLY OR INDIRECTLY OR (II) THE PARTICIPANTS' RESPONSES, IF THEY BECAME KNOWN, COULD PLACE THE PARTICIPANT AT RISK OF CRIMINAL OR CIVIL LIABILITY OR BE

DAMAGING TO THE PARTICIPANTS' FINANCIAL STANDING, REPUTATION, OR EMPLOYABILITY. (ALL RESEARCH INVOLVING SURVEY AND INTERVIEW PROCEDURES IS EXEMPT WHEN THE PARTICIPANTS ARE ELECTED OR APPOINTED PUBLIC OFFICIALS OR CANDIDATES FOR PUBLIC OFFICE. HOWEVER, CONFIDENTIALITY MUST BE MAINTAINED WHEN REQUIRED BY FEDERAL STATUTE.)

- RESEARCH INVOLVING THE COLLECTION OR STUDY OF EXISTING DATA, DOCUMENTS, RECORDS, PATHOLOGICAL SPECIMENS, OR DIAGNOSTIC SPECIMENS, IF THESE SOURCES ARE PUBLICLY AVAILABLE OR IF THE INFORMATION IS RECORDED BY THE INVESTIGATOR IN SUCH A MANNER THAT PARTICIPANTS CANNOT BE IDENTIFIED.

- RESEARCH AND DEMONSTRATION PROJECTS WHICH ARE FUNDED BY A FEDERAL AGENCY AND DETERMINED TO BE EXEMPT BY THE AGENCY HEAD AND WHICH ARE DESIGNED TO STUDY, EVALUATE, OR OTHERWISE EXAMINE: (I) PUBLIC BENEFIT OR SERVICE PROGRAMS; (II) PROCEDURES FOR OBTAINING BENEFITS OR SERVICES UNDER THOSE PROGRAMS; (III) POSSIBLE CHANGES IN OR ALTERNATIVES TO THOSE PROGRAMS OR PROCEDURES; OR (IV) POSSIBLE CHANGES IN METHODS OR LEVELS OF PAYMENT FOR BENEFITS OR SERVICES UNDER THOSE PROGRAMS.

- EXEMPTION FOR COLLECTION OR STUDY OF EXISTING DATA: RESEARCH INVOLVING COLLECTION OR STUDY OF EXISTING DATA, DOCUMENTS, RECORDS, IF THESE DATA ARE NON-IDENTIFIABLE AND PUBLICLY AVAILABLE OR INFORMATION IS RECORDED BY THE INVESTIGATOR IN SUCH A MANNER THAT SUBJECTS CANNOT BE IDENTIFIED DIRECTLY THROUGH IDENTIFIERS LINKED TO THE SUBJECT (CODES LINKING NAMES TO DATA ARE CONSIDERED INDIRECT IDENTIFIERS).

- EXEMPTION FOR STUDY OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES: UNLESS SPECIFICALLY REQUIRED BY THE STATUTE, RESEARCH AND DEMONSTRATION PROJECTS WHICH ARE CONDUCTED BY OR SUBJECT TO THE APPROVAL OF THE DEPARTMENT OF HEALTH AND HUMAN SERVICES, AND WHICH ARE DESIGNED TO STUDY, EVALUATE, OR OTHERWISE EXAMINE:
 - (A) _____ PROGRAMS UNDER THE SOCIAL SECURITY ACT OR OTHER PUBLIC BENEFIT OR SERVICE PROGRAMS
 - (B) _____ PROCEDURES FOR OBTAINING BENEFITS OR SERVICES UNDER THOSE PROGRAMS
 - (C) _____ POSSIBLE CHANGES IN OR ALTERNATIVES TO THOSE PROGRAMS OR PROCEDURES
 - (D) _____ POSSIBLE CHANGES IN METHODS OR LEVELS OF PAYMENT FOR BENEFITS OR SERVICES UNDER THOSE PROGRAMS.

IF YOUR RESEARCH IS GIVEN EXEMPTION STATUS, THE FOLLOWING MUST BE STATED ON A COVER LETTER ACCOMPANYING ANY SURVEY OR QUESTIONNAIRES.

1. A STATEMENT THAT ALL PARTICIPATION IS VOLUNTARY
2. A STATEMENT THAT YOU ARE CONDUCTING RESEARCH AND THE REASON FOR IT (MASTER'S THESIS, PUBLICATION, ETC.)
3. PURPOSE OF THE RESEARCH - WHAT YOU ARE INVESTIGATING
4. A STATEMENT THAT ALL RESPONSES WILL BE KEPT ANONYMOUS AND CONFIDENTIAL
5. A STATEMENT THAT PARTICIPANTS NEED NOT RESPOND TO ALL QUESTIONS
6. IF PARTICIPANTS ARE YOUR OWN STUDENTS, A STATEMENT THAT CLASS STANDING WILL NOT BE AFFECTED IN ANY WAY BASED ON PARTICIPATION
7. THE NAME AND TELEPHONE NUMBER OF THE PRINCIPAL INVESTIGATOR (PI) AND FACULTY SPONSOR (IF APPLICABLE)

CLAIMS FOR EXEMPTION MAY NOT BE MADE FOR (A) RESEARCH INVOLVING CHILDREN, (B) AIDS-RELATED RESEARCH, (C) RESEARCH INVOLVING SUBSTANCE OR CHILD ABUSE OR (D) RESEARCH TO BE CONDUCTED AT THE V.A. (RESEARCH UNDER THESE CATEGORIES IS SUBJECT TO SPECIAL FEDERAL GUIDELINES.)

ALL IRB APPLICANTS MUST COMPLETE QUESTIONS 12 – 18

12. DESCRIBE THE SUBJECTS WHO WILL BE PARTICIPATING (NUMBER, AGE, GENDER, ETC.)

Four Classrooms of Preschool Disabled students from the A. Harry Moore School. Four Classroom teachers will be asked to complete both a pre-and post-survey. The researcher will be a non-participant observer to approximately 20 preschool disabled students.

13. HOW WILL SUBJECTS BE RECRUITED? IF STUDENTS, WILL THEY BE SOLICITED FROM CLASS?

After obtaining permission from the school principal, subjects will be sent an e-mail asking them to participate in the study.

14. WHAT RISKS TO SUBJECTS (PHYSIOLOGICAL AND/OR PSYCHOLOGICAL) ARE INVOLVED IN THE RESEARCH?

There are no known physiological or psychological risks involved in this research.

15. IS DECEPTION INVOLVED IN THE RESEARCH? IF SO, WHAT IS IT AND WHY WILL IT BE USED?

No, deception is not involved in this research study.

16. WHAT INFORMATION WILL BE GIVEN TO THE SUBJECTS AFTER THEIR PARTICIPATION? IF DECEPTION IS USED, IT MUST BE DISCLOSED AFTER PARTICIPATION.

The results and emerging themes will be shared with the participants.

17. HOW WILL CONFIDENTIALITY BE MAINTAINED? WHO WILL KNOW THE IDENTITY OF THE SUBJECTS? IF A PRE AND POST TEST DESIGN IS USED, HOW WILL THE SUBJECTS BE IDENTIFIED?

All survey questions will be created using Qualtric's secure online server. The researcher will be the only one to know the identity of the participants. No names will be used in field notes collected during observation.

18. HOW WILL THE DATA BE RECORDED AND STORED? WHO WILL HAVE ACCESS TO THE DATA? WHERE WILL IT BE STORED? ALL DATA MUST BE KEPT FOR A MINIMUM OF THREE YEARS.

Observation field notes will be recorded by hand then transcribed. This data will be transferred to a flash drive. Both the written notes and flash drive will be locked in a file cabinet, in the researcher's home, for three years. Survey data will remain on the secure Qualtrics website. Only the researcher will have access to the data.

Informed Consent Form

I agree to participate in a study entitled “Robot Skills and Cognitive Performance of Preschool Disabled Children,” which is being conducted by Stephanie Talalai, a doctoral candidate in the Educational Technology Department at New Jersey City University. The purpose of this study is to determine if the use of robotics with students classified as preschool disabled will increase their school readiness skills and cognitive performance. I understand that the data collected in this study will be combined with data from previous studies and will be submitted for publication in partial satisfaction of the requirement for the degree of Doctor of Educational Technology Leadership.

I understand that I will be required to answer online Qualtrics pre-and post-survey questions and that my students will be observed using robotics within my classroom setting.

I understand that my responses will be anonymous and that all the data gathered will be confidential. I agree that any information obtained from this study may be used in any way thought best for a doctoral dissertation publication provided that I am in no way identified and my name is not used.

I understand that there are no physical or psychological risks involved in this study and that I am free to withdraw my participation at any time without penalty.

I understand that my participation does not imply employment with the state of New Jersey, New Jersey City University, the principal investigator, or any other project facilitator.

If I have any questions or problems concerning my participation in this study I may contact Dr. Christopher Carnahan at 201-200-3078 or Dr. Beimnet Teclezghi, Chair of NJCU Institutional Review Board, at 201-200-3139 or email bteclezghi@njcu.edu.

Signature of Participant

Date

Stephanie Talalai

Signature of Principal Investigator

Date

References

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