EDTC 809: Assessments and Evaluation

Project 3

Proposal Survey Field Research

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Brief Description of Study

This mixed method research study purpose is to examine the importance and benefits of using adaptive learning assessments in a higher education remedial Mathematics classroom located at a New Jersey University X. Johnson, Onwuegbuzie, & Turner (2007) defined mixed method research as, “the type of research in which a researcher or team of researchers combines elements of qualitative and quantitative approaches for the purpose of breadth and depth of understanding and corroboration" (Johnson *et al*, 2007). Creswell (2018) also added that mixed method designs have a procedure for collecting, analyzing, and combining both quantitative and qualitative methods in a single study or a series of studies to comprehend a research problem (Creswell, 2018). The researcher’s study will be more of a qualitative research than a quantitative researcher, exploratory mixed method research (Plano Clark & Ivankova, 2016). Exploratory mixed methods give priority to qualitative, the researcher believes it is essential for this study because students’ perspectives for the study will answer most of the research questions. The benefits of exploratory are that a single researcher can focus on individual method, instead of doing it at the same time. The exploratory mixed methods issues are that there might not be enough time for a second follow-up. In addition, the development of the instrument for the exploratory might be complexed because it required a psychometric procedure.

The twenty-first century is evolving into an era of innovative technology that is changing schools and strengthen or enhancing the current curriculum. Today’s students are learning to be more independent of the technology that they are using and school is also trying to implement those technologies in the classroom. Therefore, many instructors are combining their traditional face-to-face learning with innovative technology to engage and improve their classroom activities and students’ learning outcome. In his report, Smith (2017) instruments were survey on

google forms (https://goo.gl/IBxzJL), observations, and interviews for seventeen participants (n = 17). Most of the questions on the google form and interview were related to my research, "e.g. question 9: What is your comfort level with technology? And response: (1) very uncomfortable (2) Uncomfortable (3) Unsure (4) Comfortable (5) Very comfortable. Question 10: What is your comfort level with K-8 mathematics adaptive learning programs? (1) Very uncomfortable (2) Uncomfortable (3) Unsure (4) Comfortable (5) Very comfortable. Interview questions 7 (1) Tell me about a time you used an adaptive learning program as a K-12 student. Follow up questions: (a) Why do you think it was used? (b) How did you feel about using it? (c) What were your positive or negative perceptions?" (Smith, 2017). The researcher for this study will additionally send some survey questionnaires created on Survey Monkey for the students and instructors to fill out via email or during the classroom observation. The Survey Monkey questionnaires will consist of ten qualitative questions that are open ended and ten quantitative questions that are Likert scale.

In this report study, the researcher will administer research involving higher education students from age 18 years and older and teachers who are taking or teaching mathematics class. The instruments will consist of survey questionnaires, interviews, and classroom observations. After the Internal Review Board's (IRB) approval, the researcher will communicate with faculty members about the research study during the departmental meeting. The study will be approximately a four to six weeks project. In addition, emails and letters will be distributed to the faculty of the Mathematics department; Students will be emailed as well. The researcher will visit the classrooms of the teachers' that agreed to the research and speak to the students and will also observe the class. The interview will consist of five main questions for students and teachers. The researcher plan to have at least five students and one teacher to interview; observe

a faculty while using the adaptive learning assessment in the classroom. During the observation process, the researcher will use that period after the class to interview the instructor and students who agreed to do the interview for 40-60 minutes. For the coding process, the researcher will collect, analyze, and decode data collection and accumulate similar themes to present a final report for this study.

Participants

The researcher's study population will be on higher education students from the age of 18 years and older. The sample size will be twenty students and two faculty professors who are already teaching mathematics in a remedial class. The participants will be in the range from 18 years or older. The purposeful sampling for the study will be based on the complete target population and time location sample. Patton (2015) defines complete target population as, "Interview and/or observe everyone within a unique group of interest", and time location sample as, "Interview everyone present at a particular location during a particular time period" (Patton, 2015). The researcher is a mathematics adjunct teacher at University X. Therefore, some of the students filling out the survey might come from the researcher's mathematics classroom and the others from a faculty in the mathematics department.

The researcher's interest is in mathematics because seeing students struggling and hating the subject at the beginning of each semester needed to be studied. The assumptions of the research might be that the students from the researcher's classroom will willingly fill out the survey; this might create a problem when students choose not to complete the survey or be interviewed. Another issue might be that students and faculty might not have the time to do the interview or fill out the survey questionnaires. The researcher will be able to conduct the

research study, after the IRB's approval from New Jersey City University (NJCU). The researcher will first of all speak to teachers during a biweekly departmental mathematics meeting and determine which faculty is eligible for the study. In addition, the researcher will also send emails and letters in the mailbox to instructors with permission by the chairperson of the mathematics department. The researcher will visit a couple of mathematics classes with permission of the faculty members and chairperson, to speak to students, and also send an email about the study and their rights to participate.

Research Questions

The following indicates the research questions for the study:

(1) Do students and faculties believe using adaptive learning assessments improved the learning outcome in remedial mathematics courses?

(2) What are some concerns students and instructors have when using adaptive learning assessments?

(3) What are students' attitudes toward using adaptive learning assessments?

a. Does using such assessments help improve students' knowledge of Mathematics?

b. Do students' anxiety minimized when using adaptive learning assessments throughout the semester?

(4) What are faculties' perspectives when using adaptive learning assessments?

a. Is there a big difference in using traditional face-to-face instructions and adaptive learning instrument?

b. Does instructors' teaching approach change throughout the years, since using adaptive learning assessments in their classroom?

Need of Study

With the development and innovation of technology in schools, students and teachers have taken advantage of such change to build a strong, engaging, and cognitive classroom environment. Adaptive learning has recently been implementing in most mathematics classroom to enhance the learning outcome, but has not replace the traditional face-to-face learning. Many researchers believe that adaptive learning can benefit students' learning outcome (Chen *et al*, 2018; Zhang & Chang, 2016; Walkington, 2013; and Stoyanov & Kirschner, 2017). Adaptive learning allows learners to work on their own pace at any given time and place without worrying about spending of lecture in the traditional classroom (Chen *et al*, 2018; Zhang & Chang, 2016). Walkington (2013) reports that adaptive learning is growing in the school systems to enhance the learning outcomes in the classroom (Walkington, 2013). Stoyanov & Kirschner (2017) define adaptive e-learning as innovative instructional tools that meet the needs of students and teachers (Stoyanov & Kirschner (2017). Therefore, the adaptive learning will be studied to understand students' and faculties' attitudes towards the assessments with the benefits.

Method

The purpose of this mixed methods research is to determine the significance of using mathematics adaptive learning tools and how to minimize students' math anxiety in remedial courses. Also, the purpose of the study is to comprehend teachers' and students' attitudes when implementing the assessments. The study will do an exploratory sequential mixed method research, in which "the researcher first begins with a qualitative research phase and explores the views of participants" (Creswell, 2015 & 2018). This design will allow the researcher to decode

the collected data and analyze the information to have a better perspective from both students and teachers.

Possible Types of Questions Asked

Based on the interviews from both the instructors and students, the researcher will use open-ended questions that will help gain some insight on their attitudes of learning, understanding, engaging, and teaching through the implementation of the adaptive learning assessments in a classroom setting. Below are some possible interview questionnaires:

Possible Teacher Interview Questions

1. How long have you been teaching math?

2. Do you see any improvement in your math class since you have been using adaptive learning in your classroom? (comparing years of experience before/after)

3. Describe how you use the adaptive learning assessment to target individual students?

4. What are some advantages/disadvantages of using adaptive learning assessments in a classroom setting?

5. Are students motivated in the classroom when using the assessments?

Possible Students' Interview Questions

1. Do you like Mathematics? Does it give you anxiety? Why?

(Researcher will define anxiety to the participants)

2. How is using adaptive learning assessments (MyMathLab) helping you cope with the mathematics lessons? Do you feel the classroom activities, classwork, and home assignments using adaptive learning help you gain a better understanding of a lesson?

3. How are you engaged in learning during your adaptive learning class activities?

4. Is there an improvement in your grade since you use adaptive learning assessment in your math or STEM class?

5. What are some benefits and disadvantages of using the assessments?

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