EDTC 806: Research Methods in Education Technology Leadership

Qualitative Research: Using adaptive learning assessments in Higher Education

A Study of Faculties and Students' Approaches

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Aminata E. Bamba Adewumi
New Jersey City University

Author Note

Aminata E. Bamba Adewumi, Department of Educational Technology, New Jersey City University

Correspondence concerning this article should be emailed to Aminata Bamba Adewumi at edidi112@gmail.com

Introduction

Introduction

In the early years, integrating computer technology into instruction and impact assessment has not been the primary priority of reformers. Using technology into the classroom in those early days was complexed because most teachers were overwhelmed and tense to learn and cope with the new device. When it was first introduced, there was minimum knowledge and training of the device. Nevertheless, there was hope that incorporating technology would successfully improve students' learning outcome and ease teachers' teaching outcomes (Sandholtz, Ringstaff, & Dwyer, 1997). The role of technology in school is a supplementary assessment; but it should not substitute the formal education in which learning, and teaching is still essential and necessary. As the perspective of teaching and learning is changing throughout the years, the adaptation of technology in the classroom is crucial for the twenty-first century students and educators. As twenty-first century learners move to new technological era, their skills (e.g. problem solving, logical, coaction, critical, and philosophical) also need to develop as the formal education of just using a textbook and paper is being infrequent (Angiello, 2010; Flores *et al*., 2015). Liana Landivar (2013), a U.S. Census Bureau sociologist, 2013 report states that there are disparities in STEM occupation among minorities in the United States because less higher education scholars continued their education in the fields (Landivar, 2013). Scholars choose other majors because they are less interested or inspired, the courses are too hard to understand, develop anxiety, and are unprepared (Landivar, 2013; Ortiz *et al*, 2015). Thus, there is an enormous STEM education gap and also high demand for STEM graduates.

As a result, many institutions tried to implement adaptive learning assessments so that learners can learn at their own pace and time, understand the subjects that is too problematic in

STEM courses, and minimizing the educational gap. There are several factors of using technology in the classroom, such as instructors' and students' personal beliefs and approaches. This qualitative research study will explore some of the factors as well as understanding the usage of adaptive learning assessments in higher institution.

Statement of the Problem

The problem mentioned in this qualitative action research study derives from various issues related to using technology and adaptive learning assessments in the classroom. Some issues derived from the lack of STEM field and the anxiety that students encountered when studying STEM courses such as Mathematics and Sciences. According to García-Santillán *et al*. (2017), scholars produce anxiety when mathematics relates to tests, problems solving, textbook, and hearing mathematics subjects (García-Santillán et al, 2017). In addition, Lawson (1992) states that many mathematics educators think that all knowledgeable individual should be able to be literate in the subject (Lawson, 1992). Furthermore, students select other majors such as arts and humanities in Higher Education instead of STEM disciplines because they are not strong in those subjects' materials, develop concerns and worries, unable to relate the field to real life situations, and face various complications (Landivar, 2013; Ortiz *et al*, 2015; Lawson, 1992; Elçi, 2017; Sloan, 2010). Hence, mathematics and sciences anxiety could be minimized when using adaptive learning assessments so that students can practice at their own pace; computer-based instructing assessments has been placed in institutions to support the learning outcomes (Griff & Matter, 2013).

Another issue is based on the qualitative research itself. Creswell (2015) describes five main issues surrounding qualitative research that define this study; (1) getting teachers or

students to respond to qualitative survey questionnaires and information, (2) learning to collect data from early reports of case studies, (3) asking necessary and appropriate questions, (4) making sure that participants write complete and clear response, (5) having hard time getting permission to implement materials (Creswell, 2015, p.228). In addition, educators complain that time is a serious issue when trying to implement technology assessments in their lectures (Sandholtz, Ringstaff, & Dwyer, 1997, pg37). These problems and issues can affect instructors, students, as well as the institution if appropriate measure is not taken. This study will examine the importance of using adaptive learning to ease instructors' lessons and reduce students' attitudes toward problematics courses.

Purpose

The aim of this qualitative action research is to ascertain the importance of implementing adaptive learning assessments in the classroom, especially STEM courses. Furthermore, the goal is to understand instructors' and students' approach and attitudes toward the assessments; as well as comprehending students' anxiety and scarce toward STEM subjects.

Research Questions

The research questions for this study will include the following:

(1) What are the students' attitudes toward using adaptive learning assessments to study and practice inside and outside the classroom?
    a. Does using such assessments help improve students' understanding of STEM courses, such as Mathematics?
    b. Do students' anxiety reduced when using adaptive learning assessments improve throughout the semester?

(2) What issues/problems does students and instructors encounter when using adaptive learning assessments?

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

   a. Does instructors' attitudes impact students' learning outcomes?

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

Limitation, Delimitation, Assumptions

The limitations of the qualitative study are based on determining the students' and faculties' attitudes toward using adaptive learning assessments in the classroom or at home. Their attitudes may be negatives (Lawson, 1992; Elci, 2017). The participants may not be willing to be part of the research, which will result in a smaller size sample for the study. Therefore, the researcher might need to use sample size outside of the determine institutions; such as using social media as a random sample. Another limitation, participants' who are willing to continue with the research may not complete the survey questionnaires in a timely manner. In addition, time and availability is a concern for the teachers in Higher Education because most of the participants are adjunct teachers who do not stay in one location.

The delimitation involving students' attitudes toward STEM courses such as mathematics may affect the report of the qualitative research. The participants' anxiety toward the subjects can influence their thinking and the unwillingness to not complete the data collection. Lawson (1992) states that "students do not richly triumph in mathematics because they grow some negative attitudes towards the subjects". In addition, these negative attitudes can impact their

achievement and lose their self-assurances in the material (Elçi, 2017). Another delimitation is that the participants may not be using adaptive learning assessments in their classroom; therefore, the classroom observation process will not benefit the study. Also, the appropriate STEM or mathematics department may not be willing to involve in such result because they are presently using those assessments to improve their students' retention rate.

The assumptions of the study are that participants will automatically accept to complete the survey or be interviewed because they may have a lot to say about using adaptive learning assessments. The researcher may assume that the sample size might increase if using other platforms such as educational social media platform. Another assumption is that the survey will be completed in a timely manner with the type of survey being use in the research. In addition, educators' assumption that well-educated students should be able to solve any type of mathematics problems (Lawson, 1992); therefore, their answers for the study might be biased.

Literature Review

Introduction

Technology usage in STEM courses affect the development and building skills of todays' students. The technology being used by educators and students mostly depend on their acquaintance and experience on the device as well as instructive purposes. In addition, understanding and defining the process of adaptive learning and determining students' educational gap in STEM fields such as Mathematics is also necessary for this qualitative action research. In addition, the qualitative study will determine the students' and educators' approaches towards using the assessments as well its improvement and learning outcome. Hence, it is vital to fleetingly study the field of adaptive learning in mathematics with students' anxiety and its related literature between the age of eighteen or thirty.

Thorough review of relevant studies and theory

Adam Newman and colleagues define adaptive learning as a ground-breaking data compelled approach that uses computers as collaborating instructional devices according to the specific desires of each novice (Waters, 2014). Adaptive learning provides additional time to various learners according to their own pace (Chen *et al*, 2018; Zhang & Chang, 2016). Walkington (2013) states that adaptive learning technologies are evolving in instructive setting to modify teaching to learners' background, experiences, and previous knowledge (Walkington, 2013). Finally, Stoyanov & Kirschner (2017) defines adaptive e-learning environment as an interactive structure that distinguishes and adjusts eLearning material, pedagogical prototypes, and connections between contributors in the environment to meet the needs of individuals as they arise (Stoyanov & Kirschner (2017). The research study will be based on qualitative action study. Creswell (2015) defines action research design as either quantitative, qualitative research,

or mixed methods in which researchers who are also educators tried to gather data and improve the way the educational setting works; the practice of education by studying problems they encounter (Creswell, 2014 & 2015; Shamburg & Rabinovich, 2016). In the dissertation action research study, Segal (2009) states that using action research for a study is respected problem-solving devices because it provides better reflection and personal transformation for teachers (Segal, 2009). The adaptive learning assessments learning management, electronic learning or homework database, etextbook, open educational resources, classroom response, online study materials, and multimedia sites.

García-Santillán *et al* (2017) and Lawson (1992) reported that students' mathematics anxiety is mostly connected by having panic, scrambled thinking, and incapability to concentrate while taking tests, solving mathematical assignment, using workbook, and listening to instructors' teaching the subjects (García-Santillán et al, 2017; Lawson, 1992; Sloan, 2010). In addition, these anxiety and fear result in the educational and achievement gap for students in which they end up choosing other majors instead of STEM majors (Landivar, 2013; Lawson, 1992). Based on early 1950's researches, the meaning of *Mathematics Anxiety* was originally mentioned by Dreger and Aiken in 1957 (Dreger & Aiken, 1957; García-Santillán *et al*, 2017 p. 242). They defined mathematics anxiety as the existence of a condition of sensitive responses to arithmetic and mathematics (García-Santillán *et al*, 2017 p.242, Dreger & Aiken, 1957 p.344). The intention of García-Santillán *et al* (2017) study was to distinguish the variables that define the concern towards mathematics in college students. Consequently, García-Santillán *et al* (2017) determine two variables, the Richardson and Suinn (1972) scale called the *Pentadimentional Model of anxiety* and the Alexander Martray (1989) items scale which focus on seven of the twenty-five items: items 6, 7, 12, 13, 22, 23, and 25 (García-Santillán *et al*, 2017

p.247-249; Richardson & Suinn, 1972; Alexander & Martray, 1989). The *Pentadimentional Model of anxiety* had the following features: anxiety during test and numbers, for the assessments, toward mathematics workbook, and activities (García-Santillán *et al*, 2017 p.247-249; Richardson & Suinn, 1972). Alexander Martray (1989) seven items scale: item 6 "given homework coursework of tough problems due the following day of class", item 7, "acknowledging that a mathematical exam is coming soon", item12, "receiving the final mathematics mark in the mail", item 13, "opening a mathematics textbook and seeing a page filled with exercises", item 22, "observing an educator's written work on algebraic equation on the blackboard", item 23, "signing up for a mathematics class", and finally item 25, "walking into a mathematics class" (García-Santillán *et al*, 2017, Alexander & Martray, 1989). In addition, Lawson (1992) states the enormous amount of students enrolled in remedial courses is a lot; due to the huge failure rate of approximately forty to fifty percent that contribute to students' negative attitudes at Howard university and other universities in the United States (Lawson, 1992). Educational reform must change, based on the results of these variables and Lawson's reports, so that the assessment performance can be better. The adaptive learning assessments can be implemented to such reform to improve the learning outcomes.

In his action research study, Royer (2002) reports the usefulness of using technology to improve students' attainment. His study demonstrations that the usage of computer-based instruction programs helped students' achievement in mathematics for fourth and eighth grade scholars (Royer, 2002). In addition, educators were more likely to change and use computer device if they have a sense of connection and were more involved in testing the devices themselves. However, teachers were skeptical because they were not convinced that computer technology can benefits learning; professional development workshops were unsuccessful to

guide teachers to comprehend the benefits of integrating technology into the lessons. The action research in computer technology can take time; but through best practice, teachers needed to interact with their colleagues by doing study groups, demonstration lessons, professional journals, and peer coaching (Royer, 2002). Twenty-three qualitative research questions for teacher-researchers were used to investigate the use of technology, e.g. #3 “How can multimedia be used as an assessment tool?”, #8 “How are students, teachers, and parents affected when web pages and email are used to facilitate communication between home and school?” (Royer, 2002). In addition to the research questions, interviews, survey questionnaires, videotape, focus groups, and classrooms observations were also conducted for this action research for both students and instructors.

These studies report that using software such as MapleV, Khan academic, MyMathlab from Pearson, Webassign from Cengage, and dynamic mathematics software help students to work at their own pace, do homework examples successfully, receive fast feedback, improve learning development, being able to describe concepts, have more positive attitudes, and to answer questions on their own (Afonso Gutierrez & Dorta Diaz, 2001; Zengin *et al*, 2017; Zengin (2017; Zhang & Chang, 2016; Stewart, 2012; Brawner, 2000). Bulut *et al* (2011)’s qualitative research methodologies report that pre-service mathematics instructors use worksheets math software for teaching GeoGebra (Bulut *et al*, 2011). The pre-service teachers stated that the use of the software was easy and helpful to write test questions, build web pages, calculate algebraic expressions, but also want to use the GeoGebra for real life word problems.

Additional researches show that using computer-assisted learning (CAL) or internet-based learning devices improved the learning outcomes (Cooke *et al*, 2008; Lewis, 2003; Griff & Matter, 2013). Griff & Matter (2013) report that software has been established using processers

as collaborating teaching tools that adapt queries built on the students' performance (Griff & Matter, 2013). Chen *et al*. (2018) and Zhang & Chang (2016) state that adaptive learning allows students to study at their own pace; quick learners can benefit, and the class can move on to the next lesson without waiting for the whole students' body (Chen *et al*., 2018; Zhang & Chang, 2016). Furthermore, instructors can gather data to predict the classwork to guide struggling students. Although, fixed or traditional learning is significantly useful, online learning assessment to the class activities can aids students (Angiello, 2010). However, it is important to state that combining both online technology and face-to-face learning interaction is much more efficient than just online, according to Angiello's research conclusion (Angiello, 2010). These studies also report that instructors use adaptive learning devices to modify the exam and quizzes and implement grade; however, the down side of the devices is when some students can use it to cheat (Brawner, 2000). Students are able to get outside help to do their assignments, if the process is not well monitored.

Summary

As the above researchers and studies have shown the importance of using adaptive learning assessments and understanding students' anxiety toward mathematics or STEM related fields; the learning outcome can improve and close the achievement gap in mathematics and STEM related fields. Furthermore, studies concluded that scholars benefit when using online assessments because they can work on their own pace and time by looking at lessons and practice some exercises. Students can easily find extra help online (e.g. online tutor or Khan Academy), so that they can do better on their tests to reduce their math anxiety.

Methodology

Introduction

After the topic has been selected and the literature review has been described, next is the data collections from students and faculties in the following methodology procedure. This qualitative research is the appropriate setting to get the thoughts of students and educators who uses adaptive learning assessments within or outside the classroom. Qualitative research is well suited to address the research issues about using adaptive learning in higher education and understanding or try to solve students' lack of interest in mathematics or STEM related field. Qualitative research depends on text and draw different designs such as action research design that will be used in this study. Creswell (2014 & 2015) defines qualitative research as an method that emphases on exploring individuals' knowledge by gathering and analyzing text data in words or images (Creswell, 2014 & 2015). Segal (2009) earlier states that using action research in her dissertation study provides excellent reflection and personal transformation for teachers (Segal, 2009). The literature in this qualitative research will performance a huge role in studying the above research questions, modifying the study problem, and producing a necessity for the study. The researcher will use qualitative survey questionnaires as shown in Appendix A and B for students and instructors. The aim is to determine if students and faculties' attitudes toward using adaptive learning improve the learning outcomes.

Research Design

In the literature review, it was determined that pre-services teachers serve as carriers of math anxiety and students' anxiety of mathematics result in changing their major to non-STEM fields and create a huge gap in the field (García-Santillán et al, 2017; Lawson, 1992; Sloan, 2010; Landivar, 2013). Furthermore, Segal (2009) states that using action research can intensify

the professionalization of education, improve inspiration and effectiveness of the teacher, and benefit educators to meet the needs of different student who fear mathematics or STEM related fields, while attaining triumph with "standards-based" restructurings of implementing adaptive learning assessments (Segal, 2009). The action study will use qualitative surveys which is useful to determine students and teachers' thoughts about the problem and the importance of using adaptive learning assessments in the classroom. In addition, the researcher seeks to define a trend that is presently being applied in higher education in the tristate area. Using qualitative surveys will provide the necessary information to evaluate the programs in the institutions (Creswell, 2015, p.379). This qualitative research study will assemble data in text written word from both students and teachers through questionnaires to answer the research questions: (1) What are the students' attitudes toward using adaptive learning assessments to study and practice inside and outside the classroom? (a) Does using such assessments help improve students' understanding of STEM courses, such as Mathematics? (b) Do students' anxiety reduced when using adaptive learning assessments improve throughout the semester? (2) What issues/problems do students and instructors encounter when using adaptive learning assessments? (3) What are educators' attitudes toward using adaptive learning assessments? (a) Does instructors' attitudes impact students' learning outcomes? (b) Does instructors' teaching approach changed throughout the years since using adaptive learning assessments in their classroom?

Population & Sample

The population will be based on students and faculties from New Jersey Universities, Hudson County Community College (HCCC) and New Jersey City University (NJCU). The reason for these two colleges is because most faculties work in both institutions and use the same

assessments in their mathematics classroom, MyMathLab from Pearson. Therefore, the sample size will be approximately sixty students and fifteen educators from the STEM or mathematics departments to complete the survey. The sample questions for students is included in this study in Appendix A; teachers' questionnaire is in Appendix B. The researcher will distribute the survey through their school email taken from the STEM or Mathematics department. In addition, during the faculty development meeting, the researcher will ask instructors to provide their cell phone numbers after explaining the study in detail as shown in Appendix C. The students, instructors, or departments' head will also see the questionnaires before completing the survey online (see Appendix A and B).

Researchers' Position

The researcher's position is an educator at both institutions, Hudson County Community College (HCCC) and New Jersey City University (NJCU). The researcher's interest is in mathematics because the researcher also teaches math and see how students struggle and dislike the subjects in the beginning of every semester. The assumptions of the research will be having the survey completed without any biased that is based on race and gender. The researcher will work with sixty or more students from age eighteen to thirty in Higher Education setting.

Procedures

The researcher developed ten qualitative survey questionnaires for students and faculties (see Appendix A and B). Usually students and faculties do not have enough time filling out or respond to the surveys because of their busy schedules. For instance, most students are full-time students and workers also; while, some instructors are adjunct teachers who teach in different

institutions. Nevertheless, students and instructors will be reminded to fill out the survey through email and faculties mail box in the STEM or mathematics department.

Before conducting the research, the researcher will get permission from the schools Internal Review Board (IRB). Later, as shown in Appendix C, a letter will be mailed or email to the department. After approval, participants (students and faculties) will be informed of their rights as research members and may continue or discontinue from the study. If the students is in the researcher's actual class, the students will be informed to use their cell phone and go to the qualitative survey URL provided in Appendix A. The survey was created on Survey Monkey so that the data could be save and not disorganized. The teachers' survey will have part qualitative and quantitative questionnaires that will help in answering the above research question. In addition to the survey, interviews will also be conducted through random selection of students and faculties in mathematics classes (see Appendix D). The researcher will be conducting the interview for instructors at the adjunct faculty lounge with some visitation of full time faculties if possible. The students' interview will be done in the students' activity lounge or during lunch. The results of the collected data will be coded to determine the importance of using the assessments and identifying students' anxiety when taking mathematics class.

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Appendix A

Survey: Students' Qualitative Questionnaire on Survey Monkey:
https://www.surveymonkey.com/r/CTYRCWC

Title: Adaptive Learning in Higher Education
Purpose: The purpose of this Research evaluation is to determine the importance of using Adaptive Learning Assessments in Higher Education.

Definition: Adaptive learning, also known as adaptive teaching, is an educational method which uses computers as interactive teaching devices, and to orchestrate the allocation of human and mediated resources according to the unique needs of each learner.

Adaptive Learning Assessments:

1. Learning Management System (e.g. Blackboard, Canvas, Moodle)
2. Digital Learning/Homework Program (e.g. MyLab,Webassign Mastering, Connect)
3. EBook (e.g. Pearson eText, Vitalsource, RedShelf)
4. Open Educational Resources (e.g. OpenStax)
5. Classroom Response/Clickers (e.g TopHat, iClicker, Learning Catalytics)
6. Plagiarism detection system (e.g. Turnitin)
7. Online self-quizzing and study tools (e.g. Quizlet, Quizizz, Kahoot, Chegg Study)
8. Online tutoring sites (e.g. Khan Academy, School Online Tutoring)
9. Multimedia sites (e.g. Youtube, Google)

1. Name of School and Age:

2. What Mathematics Class are you taking this semester? (e.g. Basic Math, Basic Algebra,

College Algebra,...)

3. What do you (Student) think about Adaptive Learning in your Mathematics Class?

4. What are the biggest benefits of using Adaptive Learning in the Mathematics Class? Give at least 5 or more benefits.

5. What problem (s) does the student encounter when using Adaptive Learning assessments?

6. Does using Adaptive Learning assessments ONLY help improve your grade?

7. Does the Class Lecture ONLY help improve your grade?

8. Does using BOTH the Class Lecture and Adaptive Learning Assessment help improve your grade?

9. Do you have a Tutor/Online Tutor?

10. (a) In a weekly bases, How many hours per day do you study for Mathematics?

(b) In a weekly bases, How often do you do your homework assignment?

Appendix B

Dear Educators,

I am recently doing a research on how students and educators use Adaptive Learning assessment in the classrooms.

Purpose: The purpose of this Research evaluation is to determine the importance of using Adaptive Learning Assessments in school and in Mathematics classroom.

Definition: Adaptive learning, also known as adaptive teaching, is an educational method which uses computers as interactive teaching devices, and to orchestrate the allocation of human and mediated resources according to the unique needs of each learner.

Adaptive Learning Assessments:

1. Learning Management System (e.g. Blackboard, Canvas, Moodle)
2. Digital Learning/Homework Program (e.g. MyMathLab, WebAssign Mastering, Connect)
3. EBook (e.g. Pearson eText, Vitalsource, RedShelf)
4. Open Educational Resources (e.g. OpenStax)
5. Classroom Response/Clickers (e.g TopHat, iClicker, Learning Catalytics)
6. Plagiarism detection system (e.g. Turnitin)
7. Online self-quizzing and study tools (e.g. Quizlet, Quizizz, Kahoot, Chegg Study)
8. Online tutoring sites (e.g. Khan Academy, School Online Tutoring)
9. Multimedia sites (e.g. Youtube, Google)

1. Are you an Adjunct or Full-Time Faculty?

- Adjunct Faculty
- Full-Time Faculty

2. Which School (s) do you Lecture?

(State School Name, City, and State)

3. Which Mathematics level(s) class (es) do you teach?

- Academic Foundation Math (e.g. Basic Math, Basic Algebra, Intermediate Algebra, Arithmetic...)

- College Level Math (e.g. College Algebra, Pre-calculus, Calculus...)
- Both Academic Foundation and College Level Math
- K-12 Level Math

4. How satisfied are you (educator) with the adaptive learning in your classroom (s)?

- Very satisfied
- Satisfied
- Neither satisfied nor dissatisfied
- Dissatisfied
- Very dissatisfied

5. How helpful are the tools (e.g. e-book, videos, homework, grading)?

- Extremely helpful
- Very helpful
- Somewhat helpful
- Not so helpful
- Not at all helpful

6. What type of Mathematics anxiety or problems do you mostly encounter in student (s) in the classroom? (Select all possible answer)

- Student state, "I hate Math because..."
- The student does not get extra help outside of class (e.g. tutor, khan academy, online videos, online tutoring, relative help, and teachers' help)
- The student comes in class late or have many absences
- The student does not take note
- The student likes Math but do not... (e.g. do homework, study, practice)
- The student complains about... (e.g. hard online homework assignment, understanding online lecture or notes or videos...)
- The student does not have access online to do homework or test

7. Why using the adaptive learning assessment (s) in the classroom useful or not useful?

8. What are some advantages and disadvantages of using adaptive learning in your classroom?

9. When students answer the question (s) wrong on the assignment using the assessment (e.g. MyMathLab or WebAssign) for homework or practice. They are given solution supports (e.g. view an example or help me solve it) and tips when necessary. How do you think this affects students' learning?

10. Did the adaptive learning assessment (s) helped students see their weaknesses and strengths?

Appendix C

Aminata E. Adewumi
406 Central Avenue,
East Orange NJ 07018

Date

Name of Chairperson/Instructor
School Address of Chairperson/Instructor
Department Phone number

Dear (Chairperson/Instructor Name),

My name is Professor Adewumi, I am a Mathematics Adjunct professor and a Doctoral student in Educational Technology Leadership at New Jersey City University. I am recently doing a research on Adaptive Learning assessment in Higher Education. I would like the Department's or the teachers' permission and approval on the research surveys. The research required students and instructors from the remedial class to fill out the following survey questionnaires on Survey Monkey:

Survey 1: Teacher's Questionnaire on Survey Monkey:
https://www.surveymonkey.com/r/LDNZGV7

Survey 2: Students' Qualitative Questionnaire on Survey Monkey:
https://www.surveymonkey.com/r/CTYRCWC

Survey 3: Students' Quantitative Questionnaire on Survey Monkey:
https://www.surveymonkey.com/r/JH6VPWP

Purpose: The purpose of this research evaluation is to determine the importance of using Adaptive Learning Assessments in Higher Education in the Mathematics classroom. This research would benefits students in a way to help them improve on their assignments.

Definition: Adaptive learning, also known as adaptive teaching, is an educational method which uses computers as interactive teaching devices, and to orchestrate the allocation of human and mediated resources according to the unique needs of each learner.

Adaptive Learning Assessments:

1. Learning Management System (e.g. Blackboard, Canvas, Moodle)
2. Digital Learning/Homework Program (e.g. MyLab,Webassign Mastering, Connect)
3. EBook (e.g. Pearson eText, Vitalsource, RedShelf)
4. Open Educational Resources (e.g. OpenStax)
5. Classroom Response/Clickers (e.g TopHat, iClicker, Learning Catalytics)
6. Plagiarism detection system (e.g. Turnitin)
7. Online self-quizzing and study tools (e.g. Quizlet, Quizizz, Kahoot, Chegg Study)

8. Online tutoring sites (e.g. Khan Academy, School Online Tutoring)
9. Multimedia sites (e.g. Youtube, Google)

If there is any question (s), please fill free to contact me at 201-294-1306 or Email me at aadewumi@hccc.edu

Best Regards,

Aminata Adewumi

Aminata E. Adewumi
Mathematics Adjunct Professor

Appendix D

Interview Questions

Title: Adaptive Learning in Higher Education
Purpose: The purpose of this Research evaluation is to determine the importance of using Adaptive Learning Assessments in Higher Education.

Definition: Adaptive learning, also known as adaptive teaching, is an educational method which uses computers as interactive teaching devices, and to orchestrate the allocation of human and mediated resources according to the unique needs of each learner.

Interview Questions for Students:

1. Do you like Mathematics? Why?
2. How is using adaptive learning assessments (MyMathlab) helping you cope with the mathematics lessons?
3. Is there an improvement in your grade since you use adaptive learning assessment in your math or STEM class?
4. What is some benefits of using the assessments to do your assignments?
5. What is the disadvantage of using the assessments?

Interview Questions for Teachers:

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. Are students motivated in the classroom when using the assessments?
4. What are some advantages of using the assessments in your math or STEM classroom?
5. What are some disadvantages of using the assessments in your math or STEM classroom?