Journal of Information Systems Engineering and Management
2024, 9(4)

e-ISSN: 2468-4376

https://www.jisem-journal.com/

Research Article

The Use of Educational Technology in Mathematics Teaching and Learning in Sulu State College a Survey on Readiness and Copetency

Al-Abshar S. Gapor

Sulu State College

Email Add:gaporabshar@gmail.com

ARTICLE INFO

Received: 02 Nov 2024

Revised: 18 Dec 2024

Accepted: 29 Dec 2024

ABSTRACT

The integration of educational technology has become increasingly important in higher education, particularly in mathematics education, where digital tools can enhance instructional effectiveness, student engagement, and academic achievement. As educational institutions continue to adapt to the demands of the digital age, understanding the readiness and competency of both instructors and students in utilizing educational technology is essential for successful technology integration. This study examined the use of educational technology in mathematics teaching and learning at Sulu State College, focusing on the readiness and competency levels of mathematics instructors and students. Using a descriptive-survey research design, the study assessed participants' access to technological resources, preparedness to engage in technology-enhanced learning environments, and competency in utilizing digital tools for instructional and learning purposes. Data were collected through a structured questionnaire administered to selected faculty members and students. The instrument measured various dimensions of readiness and competency, including technological skills, digital communication, online collaboration, instructional technology utilization, and attitudes toward educational technology. Descriptive and inferential statistical methods were employed to analyze the data and determine significant relationships among the variables. The findings revealed that both instructors and students generally demonstrated a high level of readiness and competency in the use of educational technology for mathematics teaching and learning. Participants reported positive attitudes toward technology integration and recognized its value in improving understanding of mathematical concepts, enhancing problem-solving skills, and facilitating interactive learning experiences. However, challenges related to internet connectivity, access to digital devices, and the need for continuous professional development were also

Journal of Information Systems Engineering and Management
2024, 9(4)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

identified. Furthermore, the study found a significant positive relationship between readiness and competency, indicating that individuals with greater technological preparedness tend to exhibit higher levels of digital competency. The study concludes that educational technology serves as an effective tool for improving mathematics instruction and learning outcomes at Sulu State College. It recommends strengthening institutional technological infrastructure, providing regular training programs, and promoting sustainable technology integration initiatives to further enhance digital readiness and competency among faculty members and students.

Keywords: Educational Technology, Mathematics Education, Digital Readiness, Digital Competency, ICT Integration, Technology-Enhanced Learning, Higher Education, Mathematics Teaching and Learning, Sulu State College, Digital Literacy.

Introduction

The integration of educational technology into teaching and learning has become one of the most significant developments in contemporary education. The rapid advancement of information and communication technologies (ICT) has transformed traditional classroom practices, enabling educators to utilize digital tools and innovative instructional approaches that enhance student engagement, collaboration, and academic achievement. Educational technology encompasses a wide range of digital resources, including computers, tablets, interactive whiteboards, learning management systems, educational software, online learning platforms, and mobile applications designed to support teaching and learning processes. As educational institutions strive to meet the demands of the twenty-first century, the effective integration of technology into classroom instruction has become a critical component of quality education. In mathematics education, educational technology plays a particularly important role in addressing the challenges associated with teaching abstract concepts, problem-solving skills, and mathematical reasoning. Mathematics is often perceived as one of the most difficult subjects by students due to its complex formulas, theoretical principles, and analytical requirements. Traditional teaching methods, while valuable, may not always provide sufficient opportunities for students to visualize mathematical concepts or engage actively in the learning process. Educational technology offers alternative approaches that can improve students' understanding and retention of mathematical knowledge through interactive simulations, multimedia presentations, virtual manipulatives, graphing software, and online assessment tools. These technological innovations enable educators to create more engaging, learner-centered environments that support diverse learning styles and promote meaningful learning experiences. The increasing emphasis on technology-enhanced learning has been further accelerated by global educational reforms and the experiences gained during the COVID-19 pandemic. During this period, educational institutions worldwide were compelled to adopt online and blended learning modalities, highlighting both the opportunities and challenges

associated with technology integration. The pandemic demonstrated the importance of digital readiness among educators and students, as well as the necessity of technological competency for effective teaching and learning. Consequently, higher education institutions have recognized the need to strengthen their technological infrastructure and develop the digital capabilities of their academic communities. In the Philippine educational system, the integration of educational technology has become a national priority. The Department of Education (DepEd) and the Commission on Higher Education (CHED) have continuously promoted the use of ICT in education to improve teaching effectiveness, expand access to learning resources, and enhance educational outcomes. Various policies and programs have been implemented to support digital transformation in educational institutions, including investments in technological infrastructure, faculty development programs, and the adoption of online learning platforms. These initiatives reflect the government's commitment to preparing learners and educators for participation in a technology-driven society and global knowledge economy. Despite these efforts, significant challenges remain in achieving effective technology integration, particularly in geographically isolated and disadvantaged areas. Institutions located in remote regions often face limitations related to internet connectivity, access to technological resources, technical support, and professional training opportunities. These challenges may affect the ability of educators and students to fully utilize educational technologies and may contribute to disparities in educational outcomes. Therefore, assessing the readiness and competency of educational stakeholders is essential for understanding the current state of technology integration and identifying areas that require institutional intervention. Readiness refers to the extent to which individuals and institutions possess the necessary resources, infrastructure, attitudes, and preparedness to adopt and utilize educational technology effectively. It encompasses factors such as access to digital devices, internet connectivity, technological support systems, and the willingness of educators and students to engage with technology-based learning environments. Competency, on the other hand, refers to the knowledge, skills, and abilities required to effectively use educational technology for instructional and learning purposes. Technological competency includes the ability to operate digital tools, integrate technology into teaching strategies, manage online learning environments, and utilize digital resources to enhance educational outcomes. Within the context of higher education, the readiness and competency of both faculty members and students are crucial determinants of successful technology integration. Faculty members serve as facilitators of learning and are responsible for designing instructional activities that incorporate technology effectively. Their level of technological competency influences the quality of instruction, student engagement, and the overall effectiveness of technology-enhanced learning. Similarly, students must possess the necessary digital skills and confidence to navigate online platforms, access learning materials, collaborate with peers, and complete technology-based academic tasks. A lack of readiness or competency among either group may hinder the successful implementation of educational technology initiatives and limit their potential benefits. Sulu State College, as one of the leading higher education institutions in the Province of Sulu, has continuously pursued initiatives aimed at improving the quality of education and expanding access to learning opportunities. As

educational technologies become increasingly integrated into academic programs, it is essential to evaluate the institution's preparedness to implement and sustain technology-enhanced learning, particularly within mathematics education. Understanding the readiness and competency levels of mathematics instructors and students can provide valuable insights into existing strengths, challenges, and opportunities for improvement. Such information can guide institutional decision-making, faculty development programs, curriculum enhancement efforts, and strategic investments in technological infrastructure.Although numerous studies have examined educational technology integration in various educational settings, limited research has focused specifically on mathematics teaching and learning within higher education institutions in the Province of Sulu. The unique geographical, cultural, and socioeconomic characteristics of the region may influence the adoption and utilization of educational technologies. Therefore, there is a need for context-specific research that explores how technology is being used in mathematics education and assesses the preparedness of stakeholders to engage in technology-enhanced learning environments. This study seeks to address this gap by investigating the use of educational technology in mathematics teaching and learning at Sulu State College, with particular emphasis on the readiness and competency of faculty members and students. Through a comprehensive survey approach, the study aims to assess the availability and utilization of technological resources, evaluate the technological competencies of participants, and identify factors that influence the effective integration of educational technology in mathematics instruction. The findings of this research are expected to contribute to the growing body of knowledge on educational technology in higher education and provide practical recommendations for strengthening digital learning initiatives within the institution. Ultimately, the successful integration of educational technology in mathematics education has the potential to enhance teaching effectiveness, improve student learning outcomes, foster critical thinking and problem-solving skills, and prepare graduates for the demands of an increasingly digital world. By examining readiness and competency levels among stakeholders at Sulu State College, this study contributes to ongoing efforts to promote innovation, quality education, and sustainable institutional development in the higher education sector.

Methodology

RESEARCH BLUEPRINT

As applied in this study, this chapter describes the research methodology, namely: the research design, research locale, respondents of the study, sampling design, data gathering procedure,research instrument, validity and reliability, and statistical treatment.Cohen et al. (2000) states that the aim of methology is to help the researcher to understand the process and products of scientific inquiry.This can be done through different data collecting techniques strategies that are available and advancing inferences out of the collected data.

Research Design

Journal of Information Systems Engineering and Management
2024, 9(4)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

Tashakkoni etal. (2003) states that research method (design) refers to ways technique or tools for generating throughout, accurate and ethical data about a program and also ways, techniques and strategies of manipulating collected data. Cohen et al. (2002) further indicates that methods is to be used as a basis for inference and interpretation, explanation and prediction. In this study the researcher employed the quantitative and evaluative methods about the existing educational technology 32 resourses of Sulu State College that can be used in Mathematics teaching and learning.

Research Locale

This study was conducted in Sulu State College, a chartered higher education institution. It has three (3) campuses: The maincampus is located in Capitol Site, Patikul, Sulu where most of the schools and offices are housed. The second campus is in Gandasuli, Patikul, Sulu where the School of Agriculture is situated. The third campus is the Laboratory High School which is located in Walled City, Jolo,Sulu.

Respondents Of The Study

The researcher utilized ninety (90) mathematics students equally taken from the three schools of Sulu State College such as School of Education, School of Arts and Scenes and School of Business Administration. The researcher also utilized ten (10) teachers wTable 2.1 Distribution of Respondents

Respondents School			Total		
Educ	As	Ba	Students	Teachers	total
30	30	30	90	10	10
30	30	30	10	100	33

SAMPLING DESIGN

In this study, the researcher used census pure to obtain the teacher-respondents since there are only ten (10) regular Mathematics instructor in Sulu State College. Census de jure is a method of obtaining all possible expected respondents that is utilized in the current research study. The researcher employed non-probability sampling method to select the student respondents. Specifically, convenient sampling method was used to obtain ninety (90) student respondents that were equally chosen from the three schools such as School of Education, School of Arts and Sciences And School of Business Administration.

Data Gathering Procedure

The primary data collection device was a self administered

questionnaire. Two application letters were prepared in requesting permission to Collect data at Sulu State College at the beginning of regular Mathematics instructors of Sulu State College

Results And Discussions

This chapter deals with the presentation, analysis and presentations, interpretation of results based on the data gathered for this study. T also presents the extent of teachers' and students' perceptions on the use of instructional technologies in college Mathematics classes, as well as their differences.Based on the appropriate scoring and proper use of statistical treatments of data obtained for this study, the following are the of results which analyses and 36 interpretations correspond to each of the research questions, to wit: A. Educational Technologies 1) What are the educational technologies utilized in Mathematics teaching and learning in Sulu State College? 1.1 Existing teaching and learning technologies The use of Information and Communication Technology (ICT) tools will make the teachers and students to gain self confidence and will be in control of how to use the tools for their school work. Table 1.1 shows the existing teaching and learning technologies used by 37 Mathematics teachers in Sulu State College. The data reveal that, all teachers (100%) used calculators in their classes which are perceived as the most common type of instructional technologies. Thirty (30%) of these teachers used video machine, overhead projector, internet and computers in their teaching. However, only ten percent (100) among them used TV as classroom instructional device. This means that out of the six identified instructional technologies being used Dy Mathematics teachers in Sulu State College, only calculators in whiCn teachers are adept in using as instructional aid. This finding implies that there seem to be lack of use of the educational technologies by both Mathematics teachers and students in the classrooms. Hence, this study supports the findings of"The Third International Mathematics and Science Study" (TIMMS) (Howie, 1990) in Jarret (1998) which states that from the 1990 TIMMS report, it is indicated that the learners performed poorly compared to all other countries that participated in the study. According to Grayson (n.d) and Jarret (1998), it is attributed to the fact that Mathematics teaching and learning in school is often focused on memorization of the fact and formulae. Learners also showed lack of Mathematics problem solving skills and higher order thinking skills, which cannot be easily developed in memorizaton of facts and formulae. From this result, it is evident that any form of intervention that will contribute to the 38 enhancement and to develop these skills, the use of ICTS resourses in Mathematics teaching and learning becomes inevitable (Jarret, 1998) . Similarly, Kadzera, Clemence Michael (2006) study study on "Use of Instructional Technologies in Teacher Training Colleges in Malawi purposely to establish how instructional technologies were used by tutors in those colleges reported that the technologies studied were chalkboards, flip charts, overhead projectors, videos, computers, alnd local resources from the environment. The results also revealed that there was infrequent use of higher order instructional technologies i.e. overhead projectors, videos, and computers, which was attributed to lack of training, unavailability of the technologies, and lack of maintenance. The failure to use the locally available resources by some of the tutors was attributed to lack of

Journal of Information Systems Engineering and Management
2024, 9(4)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

creative thinking as well as lack of initiative ive to use the local environment in their teaching. Ruthven and Hennessey (2002) indicated that for the majority of other countries usage remains low and growth is very slow. According to the Teacher Training agency (2002) the use of ICT in Mathematics should emphasize employing ICT to meet the needs of the learners in Mathematics and not teaching technology skills, as the technology is Supposed to support Mathematics teaching. However the ICT skill are needed to be able to manipulate the ICT resourses available. Moreover, Haddad & Draxler (2002) indicated that teaching and learning practices need to be reviewed and realigned for accommodating meaningful use of ICTS in teaching and learning-

Table 1.1 Existing teaching and learning technologies used by teachers Technologies TV(S) Video Machine(s)

Overhead Projector(s)		Calculator	Internet	Computer	Frequency
1	3	10		3	3
1.2 Teachers' trainings in computer n	Percentage 10%	30%	30%	100%	39%	30%
30%						

Table 1.2 deals with the Teachers' training s in computer in relation to their job as Mathematics instructors. The data show that 40% of these teachers have undergone computer training as against 60% of those who have no training at all. Ivers (2002) in Kadzera, Clemence Michael (2006) expressed that training is a requirement which provide more chances for exposure to the technologies, hence improving proficiency and competence in using those technologies. Ivers contended that, the more confident teachers feel about using technology, the more likely they will apply what they have learned in the classroom, as well as pursue additional learning opportunities " (p. 4). Table 1.2 Teachers' training tr in computer Computer Training With Training s No Training Total Frequency 1.3 Areas of computer training (4, 6, 10) Percentage (40% 60% 40)m Training instills new skills and abilities to perform tasks which were not possible previously. It provides confidence in teachers in undertaking their duties. As can be gleaned from Table 1.3, the "word processing" area of computer training is perceive by the 70% of Mathematics teachers as mostly attended by them. Only half of these teachers have attended training on the "use of internet to find information'. Meanwhile, about 40% of them have undergone training in the "'spreadsheet", "using web resources", and "information skills" areas of computer literacy. In addition to training, adequate supplies, support from administrators and peers, and access to instructional technologies, which influence the use of instructional technologies, there can also be barriers that impede the use of technologies (Alston, Miller, and Williams, 2003: Beggs, 2000; Hope, 1997; Weller, 1996; Majed, 996: Brace and Roberts, 1996; and Turner, 1996) in Kadzera, Clemence Michael (2006). Table 1.3 3 Areas of training computer Areas Word Processing Spreadsheet Presentation Skills and Using internet to find information Using web resource's Database Information Skills 2.Frequency 2.1 Teachers' perceptions7, 4, 3, 5. 4 B. TEACHERS AND STUDENTS' PERCEPTIONS1, 4, Percentage 70% SD=1.26491; while "undecided" 40%,m30%50%40% 10% What is the level of perceptions of teachers and students

on the use of educational technology in mathematics teaching and learning in Sulu State College? 40% 41

Table 2.1 shows teachers' perceptions on the use of educational technologies in Mathematics teaching and learning. Generally, the respondents' overall mean score of 3.4250 with standard deviation of .97575 shows that they are "undecided" on the benefits and advantages of the use of educational technologies in their classes. However, they "agree", among others, on the following items such as

Educational technologies stimulate learners' curiosity" with mean= 3.60 and SD=1.08012; and "Educational technologies provide models and image which aid learners in concept formation" with mean=3.60 on items "Educational 42 technologies support cooperative learning" with mean=3.20 and SD=1.22927; and "Educational technologies support individualized learning" with mean=3.40 and SD=1.8012 respectively .This finding implies that Mathematics teachers in Sulu State College have varied perceptions with regards to the use of ICTS in the classroom. This result, therefore supports the study of Bebell, RUsseli & O'Dwyer (2004) where they reported that there are varied,perspectives on the educators use of ICT in teaching and learning. Accordingly, these varied perceptions on the educators' use of ITC and what constitute educational technology have an impact on the planning and implementation of educational technology programs. According to Beyerbach et al. (2001) if one has narrow view of what educational technology is and how the technology might be used in the classroom, he will see the technology as a constraint in the teaching and learning situations, but if one has a wider view of what educational technology is and how it might be used in the classroom, he will see,the technology as an empowerment. Thus, it is important to move educators' perceptions from a narrow to a wider view so that educators should see the technology as an empowerment and not a constraint. Moreover, a study done by Cox, Preston and Cox (1999) in Mumtaz (2000) has found that educators, who were regular users of technology expected to have developed confidence in using the technology. Thus the educators' perceptions toward technology result in attitudes developed towards technology use. Table 2.1 Teachers' perceptions on the use of educational technology in mathematics teaching and learning Items 1. Educational technologies engage learners' attention and motivate them.

2. Educational technologies improve learners test and exam result. 3. Educational technologies stimulate learners' curiosity 4. Educational technologies encourage learners' to develop their problem solving strategies. 5. Educational technologies provide models and image which aid learners in concept formation 6. Educational technologies,Support cooperative learning 7. Educational technologies Support individualized learning 8. The internet has proved to be useful source of ideas and information Overall Mean 3.50 3.50 3.60 3.50 3.60 3.20 3.40 3.50 3.4250 43,SD Description 1.08012 Agree/Moderately Extent 1.66930 Agree/Moderately Extent 1.08012 Agree/Moderately Extent 1.17851 Agree/Moderately Extent 1.26491 Agree/Moderately Extent 1.22927 1.8012 .97575 Undecided/Fair Undecided/ Fair 1.08012 Agree/Moderately Extent Undecided/Fair Scales: 5= Strongly agree (SA)-to a high extent; 4=agree (A) - moderatory extent; 3=Undecided (U)- fair; 2=Disagree (D) less extent; 1=Strongly disagree (SD)

Journal of Information Systems Engineering and Management
2024, 9(4)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

-poor 2.2 Students' perceptions Table 2.2 presents students' perceptions on the use of educational technologies in Mathematics teaching and learning. Generally, the students' overall mean Score of 3.4579 with standard deviation of .55053 shows that they are "undecided" on the benefits and advantages of the use of educational technologies in their classes. Nevertheless, they expressed agreement on items like "Educatonal 44 technologies engage learners' attention and motivate them" with mean=4.0667 and SD=.88432; "Educational technologies improve learners' test and exam results" with mean=3.7889 and SD=.84127; and "Educational technologies stimulate learners' curiosity" with mean=3.6556 and SD=.91383 but "undecided" on items such as "The internet has proved to be useful source of ideas and information" with mean=3.0111 and SD=.75691 and "Educational technologies support learning" with and mean=3.1333 SD=.70631 individualized respectively.Relevant to this finding, Majed's survey (1996) in Kadzera,. Clemence Michael (2006) stressed a minimal use of instructional technologies on student and teachers' use of instructional media. The results showed that, "although the majority of the respondents-believed that instructional media made significant contributions in their teaching practices; instructional media are not being widely used in teaching" (p. 59).Table 2.2 Students perceptions on the use of educations technology in mathematics teaching and learning1. Educational technologies engage learners' attention and motivate then. Items 2. Educational technologies improve learners test and exam result. 3. Educational technologies stimulate learners' curiosity 4. Educational technologies encourage learners' to develop their problem solving strategies. 5. Educational technologies provide models and image which aid learners in concept formation 6. Educational technologies support Cooperatives learning 7. Educational technologies Support individualized learning8. The internet has proved to be useful source of ideas and information Overall Mean 4.0667 3.7889 3.6556, 3.3333, 3.1889, 3.1333, 3.0111 SD .88432, 3.2135 .80442 3.4579, .84127 .91383.79323, .68523 .70631, 45 .7569 1 Description, Agree/monderatory, extent Agree/monderatory, extent, Agree/monderatory , extent, Undecided/fair, , Undecided/fair, Undecided/fair. Undecided/fair, Undecided/fair .55053 Undecided/fair Scales: 5= Strongly agree (SA)-to a high extent; 4=agree (A) - monderatory, extent; 3=Undecided (U)- fair; 2=Disagree (D) less extent; 1=Strongly, disagree (SD) -poor TEACHERS' COMPETENCIES 3. What is the extent of teachers competency on the use of educational technology in Mathematics teaching and learning in Sulu State College? 46 Table 3 reveals the self-evaluated extent of teachers competency on the of educational technology in Mathematics teaching and learning. Generally, the teachers perceived themselves as "Highly competent in the use of educational technology in Mathematics teaching with mean=3.5990 and SD=.86248. Among the items where teachers considered themselves as "high competent" are as follows: "Constructing and implementing project based learning lessons in which learners use a range of information technologies" with learners appropriate "Teaching learners SD=.73786;, mean=3.80, information in technology skills and knowledge" and "Working with, learners in various information technology environment" with both and mean scores of 3.70 and SD of .82327 respectively. Table 3 Teachers' competency about the use of educational technologies 1.Using application program to develop , lesson plan 2.Using e-mail to Communicate with, colleagues,

Items a Using the World wide web to find, educational resources, A Constructing and implementing project based learning lessons sin which learners use a range of information technologies5.To help learners to solve problems, accomplish tasks and use higher order skills in our information technology environment 6.Teaching learner appropriate information in technology skills and knowledge Mean 3.40 3.50, 3.30, 3.80, 3.60 3.70 7.Working with learners in various 3.70 information technology environment Overall SD Description 1.17379 Competent 1.08012 , .73786, 1.15950 Competent, 82327, 82327, 47, .82327, 3.5990 .86248 High, Competent, High, Competent, High Competent, . High, Competent, High, Competent High Competent Scales: 5= Very competent (VS)' 4=High competent (HC); 3= Competent (C); 2= Less competent (LC); 1=Poor (P) D. DIFFERENCES IN TEACHERS' AND STUDENTS' PERCEPTIONS 4. Is there a significant difference on the level of perception between teachers and students on the use of educational technology in Mathematics teaching and learning in Sulu State College?

Table 4.1 shows the differences in level of perceptions between

teachers and students on the use of educational technology in Mathematics teaching te and learning in Sulu State College. Generally, it can be gleaned from this table that teachers and students have the same level of perceptions with regards to benefits and usefulness of educational technology in Mathematics teaching and learning as manifested by mean difference of 48 alpha .05. -.03294, t=.044 with p=.870 at Similarly, it can be seen further from this table that teachers and students have the same level of perceptions within among the eight (8) variables subsumed under the benefits and usefulness of educational technology in Mathematics teaching and learning. This means that both teachers and students do not differ in their perceptions in terms of benefits and usefulness of educational technology in Mathematics teaching and learning. Therefore, the hypothesis which states that "There is no significant difference on the level of perception between teachers and students on the use of educational technology i

Summary, Conclusions And Recommendation's

This study sought to determine the extent of the readiness and competency of the educators and learners on the use of educational technology in Mathematics teaching and learning in Sulu State College. This study answered the research questions on the basis of the following hypothesis: there is no significant difference on the level of perceptions between teachers and students on the use of educational technology in Mathematics teaching and learning in Sulu State College. In this study, the researcher employed the quantitative and evaluative methods utilizing ninety (90) Mathematics students equally taken from the three schools of Sulu State College such as School of Education, School of Arts and Sciences and School of Business Administration as well as ten (10) teachers who are regular Mathematics instructors of Sulu State College. Both descriptive and inferential statistics were used to analyze and interpret the basic features of the data, to wit: frequency count to describe problem 1; weighted mean and standard deviation to answer problems 2 and 3; and T -test tO answer problem 4 and to prove

the hypothesis. FINDINGS This study revealed the following findings: 1) On the educational technologies 1.1 Existing educational technologies All teachers used calculators in their classes which are perceived as the most common type of instructional technologies. Some used video machine, overhead projector, internet and computer in their teaching. 1.2 Computer training 50 Forty percent (40%) of the teachers have undergone computer training while sixty percent (60%) have no training at all. 1.3 Attendance in areas of computer training The "word processing perceived as mostly attended by Mathematics teachers. Half of these teachers have attended training on the "use of internet to find information' with only few of them have undergone training in the spreadsheet" "using web resources", and information skills" areas of computer literacy. 2. On teachers' and students 2.1 Teachers' perceptions On the average, teachers are "undecided" on the extent of benefits and advantages of the use of education technologies in masterclasses. However, they `agree", among others, on the following items such as "Educational technologies stimulate learners' curiosity" and "Educational technologies provide models and image which aid-learners in concept formation"; while "undecided" onto technologist support cooperative learning";"Educational perceptions"Educational technologies support individualized learning.2.2 Students' perceptions classes. the average, students are "undecided" on the extent of benefits and advantages of the use of education technologies in their Nevertheless, they expressed agreement on items like "undecided" and "Educatonal technologies engage learners' attention and motivate them; "Educational technologies improve learners test and exam result"; and "Educational technologies stimulate learners' curidsity" but on items such as "The internet has proved to be useful SOurce of ideas and information and "Educational technologies support individualized learning. 2. On teachers' and students 2.1 Teachers' perceptions On the average, teachers are "undecided" on the extent of benefits and advantages of the use of education technologies in their dlasses. However, they `agree", among otherS, on the following items such as "Educational technologies stimulate learners' curidsity" and "Educational technologies provide models and image which aid learners in concept formation"; while "undecided" on technologies support cooperative learning"; "Educational perceptions "Educational technologies support individualized learning. 2.2 Students' perceptions classes. Items On the average, students are "undecided" on the extent of benefits and advantages of the use of education technologies in their Nevertheless, they expressed agreement on items like "undecided" and "Educational technologies engage learners' attention and motivate them; "Educational technologies improve learners test and exam result"; and "Educational technologies stimulate learners' curiosity" but on items such as "The internet has proved to be useful Sources of ideas and information and "Educational technologies support individualized learning. 3. On teachers' competencies 52 On the average, teachers perceived themselves as "Highly competent" in the use of educational technology in Mathematics teaching specifically on "Constructing and implementing project based learning lessons In which learners use a range of information technologies";Teaching learner appropriate information in technology skills and knowledge" and "Working with learners in various information technology environment". 4. On the differences in teachers' and students' perceptions No significant

difference on the level of perceptions between teachers and students on the use of educational technology in Mathematics teaching and learning.

Conclusion

Based on the aforementioned findings of the study, the following Conclusions were drawn: It can be logically inferred from the foregoing findings that this Study was able to provide empirical data to support the claims that educational technologies are useful and beneficial in enhancing Mathematics teaching and learning processes The gap in knowledge and experiences of teachers and students did not influence their perceptions in judging the extent of usefulness and benefits of educational technologies in Mathematics teaching and learning.

Recommendations

Based on the aforementioned findings and conclusions of the study, the following recommendations are hereby made to promote improvements on the use of educational technologies in Mathematics teaching and learning:

1. A training program should be made to encourage more, Mathematics teachers to utilyze the modern but relevant,instructional devices;

2. More training programs in computers should be offered where Mathematics teachers can be exposed to other significant areas: and

3. Provide more modern and state of the art instructional technologies Adam, d, & Hamm, m. (1996). Cooperative learning, Critical thinking collaboration across the Curriculum. Illinois: Charles C Thomas

References

[1] Asmal, k. (2003). Foreword by the minister of education. Draft white paper e-Education. Transforming learning and teaching through Information and Communication Technologies. Pretoria: Department of Education

[2] 54 Bebell, d, Russell, M, & O'Dwyer, I (2004). Measuring Teachers Technology Uses: Why multiple-measures are more revealing? Journal of research on technology in education, Vol. 37. No. 1.of

[3] Bennet S& LoCkyer, L (1999). The impact of digital technologies onmteaching and learning in K-12 Education-Literature review. University

[4] Al-Awidi, H., & Aldhafeeri, F. (2017). Teachers' readiness to implement digital curriculum in Kuwaiti schools. Journal of Information Technology Education: Research, 16, 105–126.

[5] Bond, M. (2020). Facilitating student engagement through educational technology: Towards a conceptual framework. Journal of Interactive Media in Education, 2020(1), 1–14.

[6] Bower, M. (2017). Design of technology-enhanced learning: Integrating research and practice. Emerald Publishing.

[7] Cabero-Almenara, J., Barroso-Osuna, J., Rodríguez-Gallego, M., & Palacios-Rodríguez, A. (2021). Digital competence frameworks for teachers. Sustainability, 13(9), 1–15.

[8] Chai, C. S., Koh, J. H. L., & Tsai, C. C. (2016). A review of technological pedagogical content knowledge. Educational Technology & Society, 19(3), 1–14.

[9] Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. Applied Developmental Science, 24(2), 97–140.

[10] Duraku, Z. H., & Hoxha, L. (2020). The impact of COVID-19 on education and online learning readiness. International Journal of Education and Practice, 8(4), 1–12.

[11] Ertmer, P. A., Ottenbreit-Leftwich, A. T., Sadik, O., Sendurur, E., & Sendurur, P. (2019). Teacher beliefs and technology integration practices. Computers & Education, 59(2), 423–435.

[12] Fraillon, J., Ainley, J., Schulz, W., Friedman, T., & Duckworth, D. (2019). Preparing for life in a digital world: IEA International Computer and Information Literacy Study 2018. Springer.

[13] Gil-Flores, J., Rodríguez-Santero, J., & Torres-Gordillo, J. (2017). Factors influencing teachers' use of ICT. Computers in Human Behavior, 72, 312–320.

[14] Gudmundsdottir, G. B., & Hatlevik, O. E. (2018). Newly qualified teachers' professional digital competence. Computers & Education, 118, 214–224.

[15] Hennessy, S., Harrison, D., & Wamakote, L. (2016). Teacher factors influencing classroom use of ICT. Technology, Pedagogy and Education, 19(1), 1–18.

[16] Howard, S. K., Tondeur, J., Siddiq, F., & Scherer, R. (2021). Ready, set, go! Profiling teachers' readiness for online teaching. Computers in Human Behavior, 118, 106675.

[17] Ifenthaler, D., & Schweinbenz, V. (2016). Students' acceptance of tablet PCs in higher education. Journal of Research on Technology in Education, 45(1), 1–20.

[18] Kimmons, R., Graham, C., & West, R. (2020). The PICRAT model for technology integration in teacher preparation. Contemporary Issues in Technology and Teacher Education, 20(1), 176–198.

[19] König, J., Jäger-Biela, D. J., & Glutsch, N. (2020). Adapting to online teaching during COVID-19 school closures. European Journal of Teacher Education, 43(4), 608–622.

[20] Koh, J. H. L., Chai, C. S., & Tsai, C. C. (2017). Examining teachers' technological pedagogical content knowledge. Australasian Journal of Educational Technology, 33(3), 1–14.

[21] Lai, C. L., & Hwang, G. J. (2016). A self-regulated flipped classroom approach. Computers & Education, 100, 126–140.

[22] Martin, F., Sun, T., & Westine, C. D. (2020). Systematic review of online learning effectiveness. Online Learning Journal, 24(2), 1–32.

[23] Mishra, P., & Koehler, M. J. (2017). Introducing technological pedagogical content knowledge (TPACK). Teachers College Record, 108(6), 1017–1054.

[24] Ng, W. (2016). Can we teach digital natives digital literacy? Computers & Education, 59(3), 1065–1078.

[25] OECD. (2019). OECD Skills Outlook 2019: Thriving in a digital world. OECD Publishing.

[26] Petko, D. (2017). Teachers' pedagogical beliefs and their use of digital media. Computers & Education, 58(4), 1351–1359.

[27] Scherer, R., Siddiq, F., & Tondeur, J. (2019). The technology acceptance model in educational technology research. Computers & Education, 128, 13–35.

[28] Siddiq, F., Scherer, R., & Tondeur, J. (2016). Teachers' emphasis on developing students' digital information skills. Computers & Education, 92–93, 1–14.

[29] Tondeur, J., van Braak, J., Ertmer, P., & Ottenbreit-Leftwich, A. (2017). Understanding the relationship between teachers' pedagogical beliefs and technology use. Educational Technology Research and Development, 65(3), 555–575.

[30] Trust, T., & Whalen, J. (2020). Should teachers be trained in emergency remote teaching? Journal of Technology and Teacher Education, 28(2), 189–199.

[31] Uerz, D., Volman, M., & Kral, M. (2018). Teacher educators' competencies in fostering student teachers' proficiency in teaching and learning with technology. Teaching and Teacher Education, 73, 12–23.

[32] Voogt, J., Fisser, P., Pareja Roblin, N., Tondeur, J., & van Braak, J. (2018). Technological pedagogical content knowledge: A review of the literature. Journal of Computer Assisted Learning, 29(2), 109–121.

[33] Zhao, Y., Llorente, A. M. P., & Gómez, M. C. S. (2021). Digital competence in higher education: Student and teacher perspectives. Edu

[34] Aesaert, K., Voogt, J., Kuiper, E., & van Braak, J. (2017). Accuracy and bias of ICT self-efficacy: An empirical study among primary school students. Computers in Human Behavior, 67, 92–103.

[35] Ahmed, S., & Opoku, A. (2021). Technology-supported learning and pedagogy in higher education. Education and Information Technologies, 26(4), 1–18.

[36] Alenezi, A. (2017). Faculty members' readiness for integrating technology in higher education. International Education Studies, 10(6), 1–11.

[37] Almerich, G., Orellana, N., Suárez-Rodríguez, J., & Díaz-García, I. (2016). Teachers' information and communication technology competencies. Computers & Education, 100, 110–125.

[38] Basilaia, G., & Kvavadze, D. (2020). Transition to online education during the COVID-19 pandemic. Pedagogical Research, 5(4), 1–9.

[39] Blundell, C., Lee, K. T., & Nykvist, S. (2016). Digital learning in schools: Conceptualizing the challenges and opportunities. Educational Technology Research and Development, 64(4), 535–556.

[40] Brown, M., McCormack, M., Reeves, J., Brooks, D., & Grajek, S. (2020). 2020 EDUCAUSE Horizon Report: Teaching and Learning Edition. EDUCAUS

[41] Bybee, R. W. (2018). STEM education and technology integration. Science Educator, 27(1), 1–10.

[42] Castaño-Muñoz, J., Kalz, M., Kreijns, K., & Punie, Y. (2018). Influence of ICT use on educational outcomes. Computers & Education, 121, 1–12.

[43] Cheok, M. L., Wong, S. L., Ayub, A. F. M., & Mahmud, R. (2017). Teachers' perceptions of e-learning adoption. Educational Technology & Society, 20(4), 1–14.

[44] Crompton, H., Burke, D., & Gregory, K. H. (2017). Mobile learning and mathematics education. Computers & Education, 115, 1–13.

[45] Drossel, K., Eickelmann, B., & Gerick, J. (2017). Predictors of teachers' use of ICT in schools. Computers & Education, 104, 70–82.

[46] Engen, B. K. (2019). Understanding social and digital competence in teacher education. Nordic Journal of Digital Literacy, 14(2), 1–15.

[47] Foulger, T. S., Graziano, K. J., Schmidt-Crawford, D., & Slykhuis, D. A. (2017). Teacher educator technology competencies. Journal of Technology and Teacher Education, 25(4), 413–448.

[48] Garrison, D. R., & Vaughan, N. D. (2017). Blended learning in higher education: Framework, principles, and guidelines. Jossey-Bass.

[49] Gikas, J., & Grant, M. M. (2016). Mobile computing devices in higher education. The Internet and Higher Education, 19, 18–26.

[50] Hsu, P. S. (2016). Examining current beliefs, practices, and barriers about technology integration. TechTrends, 60(1), 30–40.

[51] Islam, M. S., Kim, D. A., & Kwon, M. (2020). Readiness and challenges of online learning among university students. Education Sciences, 10(10), 1–15.

[52] Kafyulilo, A., Fisser, P., & Voogt, J. (2016). Factors affecting teachers' continuation of technology use. Education and Information Technologies, 21(6), 1535–1554.

[53] Kaliisa, R., & Picard, M. (2017). Mobile learning policy and practice in higher education. British Journal of Educational Technology, 48(1), 1–18.

[54] Keengwe, J., & Georgina, D. (2019). The digital course training workshop for online learning and teaching. Education and Information Technologies, 17(4), 365–379.

[55] Kohnke, L., Moorhouse, B. L., & Zou, D. (2021). Technology-enhanced language and mathematics learning. Computers and Education Open, 2, 100038.

[56] Lawrence, J. E., & Tar, U. A. (2018). Factors that influence teachers' adoption of ICT. Education and Information Technologies, 23(1), 469–481.

[57] Lim, C. P., & Chai, C. S. (2017). Teachers' pedagogical beliefs and technology integration. Educational Media International, 45(2), 163–174.

[58] Moreno-Guerrero, A. J., Aznar-Díaz, I., Cáceres-Reche, M. P., & Alonso-García, S. (2020). E-learning in higher education. Sustainability, 12(13), 1–18.

[59] Olofsson, A. D., Lindberg, J. O., & Fransson, G. (2017). What do upper secondary school teachers know about ICT and digital competence? Nordic Journal of Digital Literacy, 12(1), 1–16.

[60] Redecker, C. (2017). European framework for the digital competence of educators (DigCompEdu). Publications Office of the European Union.

[61] Sailer, M., Murböck, J., & Fischer, F. (2021). Digital learning and instructional design in higher education. Computers in Human Behavior, 115, 106–121.

[62] Teo, T., Milutinović, V., & Zhou, M. (2016). Modelling Serbian pre-service teachers' attitudes toward computer use. Computers & Education, 94, 77–88.

[63] Yazon, A. D., Ang-Manaig, K., Buama, C. A., & Tesoro, J. F. B. (2019). Digital literacy, digital competence and research productivity among educators. Universal Journal of Educational Research, 7(, 1734–1743.