

# **Influence of Teachers' Digital Skills and Students' Experiences in Computer-Mediated Instruction Towards Students' Learning Satisfaction in Physical Education**

**Arreane Jane M. Enclonar<sup>1</sup> and Saramie S. Belleza<sup>2</sup>**

<sup>1</sup>Davao De Oro State College

<sup>2</sup>University of Mindanao Tagum College

**Abstract**— The digitization of learning offers numerous benefits but also brings forth significant challenges that can impact students' learning satisfaction with their educational experiences. As technology integration in education accelerates, the pressing need for educators to be proficient in digital tools and teaching methodologies also accelerates. This quantitative study aims to determine if teachers' digital skills and students' experiences in computer-mediated instruction influences students' learning satisfaction in Physical Education. Regression analysis was employed to determine the level of association among variables. It was found that both teachers' digital skills and students' experiences in computer-mediated instruction significantly influences students' learning satisfaction. Moreover, Teachers' digital skills directly affects learning experiences in computer-mediated instruction, which is another critical factor influencing students' learning satisfaction. Addressing these challenges requires a concerted effort to enhance digital literacy among educators and to ensure that digital learning platforms are developed with a strong focus not only on pedagogical effectiveness but also on high quality experiences among students.

**Keywords**— Teachers' Digital skills, students' experiences in computer-mediated instruction, students' learning satisfaction in Physical Education.

## **I. INTRODUCTION**

The use of online platforms could greatly impact students' satisfaction with learning in Physical Education. Students' contentment with online platforms greatly depends on teachers' effectiveness in making use of digital technologies (Guillén-Gámez, et al., 2020). Analyzing students' satisfaction with their learning is a global priority in all educational institutions, making it essential to evaluate the effectiveness of teaching subjects through digital platforms. A study of Silat (2020), emphasized the significance of maintaining classes amidst any circumstances which suggests the importance of being digitally ready.

Significantly, this study is anchored on the proposition of Keržič (2021) regarding the important role of students' satisfaction in achieving an intuition's goals. The challenges in utilizing digital platforms for teaching were a result of insufficient digital skills. It was suspected to result to lower level of student engagement, eventually student satisfaction. It was pointed out by Mukhtar et. al., (2020) that teachers experience heightened levels of stress when they are tasked with using digital tools that they have low level of mastery. Meanwhile, many students experience frustration during

online sessions when they realize that seemingly easy tasks like watching a video or uploading a document are actually more complicated than they thought. Students who are inexperienced in this particular style of learning may find it particularly difficult according to (Abuhassna, H. et.al, 2020).

Furthermore, numerous studies indicate that students are more satisfied with their education when their teachers possess strong digital abilities. Being digitally skilled means having the competence to use technology and computers proficiently for purposes such as education, research, collaboration, and work (Amhag et al., 2019). Hence, teachers need to have strong digital skills, familiarity with using digital tools for teaching, and the ability to maintain connection in digital platform.

Meanwhile, teachers, particularly from Davao de Oro State College-Maragusan stated they hardly had any experiences in utilizing the digital platform until the global pandemic occurred. Educators who excel in utilizing technology have the ability to craft enjoyable, engaging, and motivating educational activities and experiences for their students through a variety of digital resources. Students who participate in such learning

experiences tend to report higher levels of academic performance (Almusharraf et al., 2020).

The current scope of educational goals can now be achieved by using the online platforms. This platform, enables teachers and students to start and implement the teaching-learning process from a virtualized environment (Kumalasari & Akmal, 2022). Thus, the realization of computer-mediated instruction challenges the teachers to maximize their digital skills (Perveen, 2016). Therefore, the change also led to significant inquiries regarding the level of service, education, achievement, and factors influencing students' commitment to a subject. One factor is how closely the online course or program aligns with student expectations.

Accordingly, teachers' digital skills are crucial in ensuring students' learning satisfaction in digital platform. Educators who are skilled in incorporating technology into their teaching can enhance students' learning experiences through digital resources (Fraile et al., 2018). However, although students' satisfaction is evidently important, teachers must prioritize becoming proficient in using technology so that students feel more engaged and satisfied with their learning experience in computer-mediated instruction (Aslam et al., 2021).

With this, digital skills, as measured by Information and Data Literacy, Communication, content-creation, safety, and problem solving, and experiences in computer-mediated instruction as measured by computer-usage, teacher/lecturer support, student interaction and collaboration, personal relevance, authentic learning, student autonomy, equity, and asynchronicity, serve as the independent variables in this study (Northcote et al., 2019). Students' Learning satisfaction is the dependent variable, measured through course organization/structure, learner interaction, student engagement, instructor presence, student satisfaction, and perceived learning (DiLoreto, 2016). Under any circumstances, education must prevail.

Relative to previous statements, digital competencies are being used as an indicator of quality understanding of education in online platform (Napal F. et al., 2018). With the abrupt shift to online platform caused by pandemics and natural disasters, which is common in the research locale, the researcher thought of whether a digitally skilled teacher influences students' performance and satisfaction in the digital platform. Along with this, there is a need for self-assessment tool

for teachers to partially capture how teachers perceive their digital skills. Until now, different models and frameworks have been created for assessing and identifying digital capabilities. Tondeur et al. (2017) state that in the United States, teachers rely on the ISTE standards and performance indicators as crucial tools for integrating technology into classroom activities.

Moreover, Suárez-(Rodríguez J. et al., 2020) found that teachers' digital competence is a significant factor influencing both their teaching practices and their integration of Information and Communication Technology into education and that it also allows overcoming challenges that could appear while maintaining quality education even in digital environment.

On the other hand, using computer-mediated instruction in the tertiary level has presented obvious challenges. Computer-mediated instruction is the use of technical devices, tools, and the Internet in teaching (Castro, M. D. et al., 2019). Due to the continuous growth of technology, there is a significant transformation occurring in the global educational landscape. As computer-mediated instruction adapts to different learning contexts, more and more teachers can now offer interactive lessons, seamlessly share resources, and facilitate student collaboration and interaction through various online platforms (Elkhamisy et al., 2021).

The Covid 19 pandemic has made it clear that the education system is exposed to external risks (Bozkurt Shama, 2020). To enhance the students' online experience, cognitive complexity and intellectual stimulation play a key role. Teachers must ensure to offer students a learning experience that engages higher-level thinking skills, not just focusing on delivering content, even in an online setting. Students also have to cooperate in the process in order for the new mode of instruction to work. Although the planning and execution of tutorial activities can be tailored to accommodate the technical constraints of teachers in using different software, Ribeiro (2020) rightly points out that this computer-mediated instruction modality entails several logistical challenges and attitude modifications in both teachers and learners.

Moreover, implementing a computer-mediated instruction process requires an interactive teaching and learning course with a simplified structure. As students become familiar with the lesson structure, they spend less time guessing what is planned and more time

actually focusing on the lesson material. Effective course design will help learners improve their academic achievement through knowledge and skills (Khan et al. 2021). The instructors should continuously encourage, inspire, and motivate their students regardless of using computer-mediated instruction. This guidance helps students to advance their goals in finishing their college. (Amir et. al., 2020), found that students are satisfied in their learning with the computer-mediated instruction modality if there is discipline and understanding of the need to pursue learning.

Computer-mediated instruction is an electronic educational setting without physical peers but with flexibility in time and location, unlike traditional learning. A variety of comparative studies have been carried out to establish if traditional face-to-face instruction is more effective than online or blended learning methods. Computer-mediated instruction scores higher on student satisfaction rates than traditional methods (Lockman et al. 2020). In contrast with the previous observation of Powers et al. (2016), online learners receive lower scores on exams than face-to-face learners because face-to-face learners have immediate physical assistance from educators to clarify any difficult concepts and direct their queries. Nevertheless, as recommended by Mukhtar et al. (2020), the use of technology has constraints so all parties must be cautious in their planning, and collaboration among stakeholders is essential to achieve learning objectives. Moreover, researchers in the field have suggested that factors in computer-mediated instruction environments such as technical problems, feelings of isolation, and lack of social support can influence how students experience these challenges (Mohammadi Zenouzagh, 2023). Negative emotions such as anxiety, anger, and boredom are easily triggered. Therefore, when designing online courses (Coman et al., 2020), instructors and designers should take into account the factors that reduce these negative emotions, which in turn will lead to increased student learning and achievement. A study showed that students feel less anxiety, boredom, and anger when online courses have easier vocabulary, more illustrations, realistic expectations, accessible support, moderate pace, clear instructions, and enthusiastic presentation of material. Consistent with these results, a study also reported that a well-designed delivery process for online courses helped reduce student frustration, (Somayeh et al., 2018).

Furthermore, students' views on the course's general ease of use could be related to their satisfaction and acquisition of knowledge. Put simply, if the course design is well-organized and coherent, then there is a higher chance that students will be content with their learning experience. Jaggars et al. (2016) found that quality courses were characterized by well-defined goals, well-organized content, diverse opportunities for interpersonal relationships, and effective use of technology. Definitely, if students report that their learning is limited or minimal, we are responsible for redesigning our online courses, improving our teaching methods, and developing more effective assessment and assessment tools (Jaggars et al., 2016).

The level of students' satisfaction is dependent on many factors. Teachers' digital skills and students' experiences also potentially influence this dependent variable. Teachers as core instiller of knowledge should be well equipped with modern digital skills, while students should be well motivated and satisfied with their learning experiences. Hence, if the present study proves relationship among variables, this will help teachers to recognize their areas of improvement in terms of technology utilization.

With this, the present study is anchored on the Equivalency Theory (Simonson, 1999, p. 7; Simonson et al., 1999) which further suggests the idea that "learning experiences are essential" and that less learning experiences should not be forced, regardless of learning modality. Students studying online need a learning experience that is specially tailored to their learning environment. The study further reiterates that online and face-to-face learners can achieve equivalent learning outcomes only if provided with an equivalent learning experience (Garratt-Reed, 2016).

The first independent variable is based on Bandura's Social Cognitive Theory. This theory suggests that students imitate their teachers' actions and traits. Teachers need to have proficient digital skills in order to create digitally literate students who are content with their learning experiences in a digital setting. Adversely, teachers who shows low level of digital skills results to low level experiences that slow students' progress in the absence of quality instruction. Hence, prior to integration, selection of online activities, reading materials, materials, teachers must carefully consider possessing high level digital skills and prepare high level experiences that the students might do to meet their expectations (Almusharraf et al., 2020).

Furthermore, The correlation between the second independent variable and the dependent variable in this research is based on David A. Kolb's Experiential Learning Theory. This theory highlights the importance of experience, learner engagement, and student perception in the learning process. Nurcahyandi, Z., & Purwaningrum, J. (2022). Therefore, the application of educational technology in learning often encourages personal experiences. Whether the experience is good or bad depends on the quality of instruction and experiences that the learners receive (Sudarsana, 2019).

The conceptual framework of the study is illustrated in Figure 1. According to the framework, the initial variable is Teachers' Digital skills which include indicators such as information and Data literacy, communication, content creation, safety, and problem solving. The processing construct of Information and Data Literacy evaluates the teachers' capacity to recognize, arrange, save, find, recover, and interpret digital information from the students' point of view. Communication construct evaluates the teacher's skill in using digital tools to communicate, share resources, and collaborate with students, as well as interacting and participating in online communities and networks from the students' point of view.

Content-creation is when teachers can produce and modify new content in various forms like word processing, presentations, images, and videos from the viewpoint of students. The safety construct is the teacher's abilities and understanding of protecting personal, data, and digital identity, as well as maintaining security measures from the students' point of view.

Lastly, problem-solving tests teacher's ability to identify digital needs and resources, identify the most appropriate digital tools according to the purpose or need, solve conceptual problems, solve technical problems through digital means, develop creative use of technologies, and challenges one's own and others' competences in students' perspective, (Instefjord E. J. et al. 2017).

The next independent variable is the students' computer-mediated instruction experiences, which include computer usage, teacher/lecturer support, Student Interaction & Collaboration, Personal Relevance, Authentic Learning, Student Autonomy, Equity, and Asynchronicity indicators.

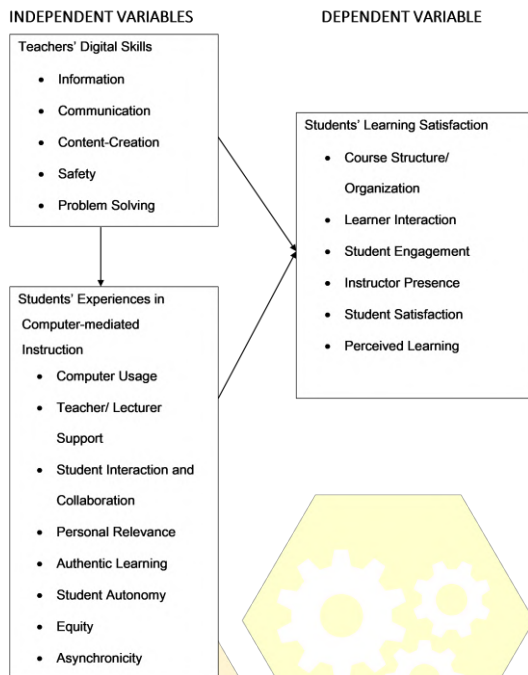
Computer usage pertains to the extent to which students favor the utilization of technology for learning purposes. Teacher/lecturer support refers to the interactions and feedbacks between students and teachers. Student Interaction & Collaboration involves students interacting with each other. Personal Relevance is the students' perception of the value of their learning experiences. Authentic Learning is the incorporation of real-world experiences into teaching. Student Autonomy is the level for which students control their own learning and learn according to their preferences. Equity measures the level of attention, opportunities and recognition given to each student by the teacher. Asynchronicity is when the students can choose between synchronous and asynchronous classes (Northcote, et. Al. 2019).

Lastly, the dependent variable of the study is students' learning satisfaction, which is crafted by DiLoreto (2016) who stated that students' satisfaction has six indicators: course organization/structure, learner interaction, student engagement, instructor presence, student satisfaction, and perceived learning. The course organization/structure includes well-defined goals, well-structured content, many opportunities for interpersonal relationships, and effective use of skills (Jaggars et al., 2016).

Learner Interaction refers to how students engage with their teacher and peers. One difficulty of computer-mediated instruction is that students experience a sense of disconnection from their peers and instructors. Student engagement is defined as the will, need, desire and compulsion to participate and succeed in the learning process" (Bomia, Beluzo, Demeister, Elander, Johnson & Sheldon, 1997, p. 294). Instructor presence in online courses can be achieved by designing, organizing, delivering, and educating courses using a variety of methods that promote positive interactions between teachers and students (Jaggars et al., 2016).

Student Satisfaction refers to how students perceive their learning experiences in the online course.

Perceived learning is the level of learning they achieved during the semester, together with student satisfaction can lead to a better understanding of the success of computer-mediated instruction, (DiLoreto et al., 2016). (Prichard et. al., 2021) also found that perceived learning outcomes contributed to student satisfaction and had a positive impact on it in an online environment.



**Figure 1. Conceptual Framework of the Study**

The significance of studying the influence of teachers' digital skills and students' experiences in computer-mediated instruction is multifaceted and profound. In the digital age, educators' proficiency with technology is not just beneficial but essential for effective teaching and learning. Studies show that teachers' digital skills are essential for creating a learning atmosphere that encourages advanced thinking abilities and gets students ready for continuous technological advancements in society and the workforce.

Moreover, the integration of ICT in education has been shown to enhance creative and individualized learning opportunities, which are key components of student satisfaction. Alternatively, how students interact with computer-based teaching can greatly influence their level of involvement and contentment. There is a direct link between student engagement and satisfaction, indicating that students who are actively participating in their learning in terms of behavior, emotions, and cognition are more likely to be happy with their education.

Due to the importance, examining the interplay between teachers' digital skills and students' experiences provides valuable insights into improving educational outcomes and student satisfaction with their learning journey. Having this knowledge is essential in creating successful educational strategies and methods that assist both

educators and learners in the changing field of online learning.

With this, current study aims to determine the influence of PE teachers' Digital skills and students' experiences in computer-mediated instruction towards the students' learning satisfaction in Physical Education in Davao de Oro State College. Furthermore, this research also sought to determine the following specific objectives:

1. To describe the level of teachers' digital skills competence in terms of:
  - 1.1 Information;
  - 1.2 Communication;
  - 1.3 Content Creation;
  - 1.4 Safety; and,
  - 1.5 Problem Solving.
2. To describe the level of students' experiences in computer-mediated instruction in terms of:
  - 2.1 Computer Usage;
  - 2.2 Teacher/lecturer Support;
  - 2.3 Student Interaction & Collaboration;
  - 2.4 Personal Relevance;
  - 2.5 Authentic Learning;
  - 2.6 Student Autonomy;
  - 2.7 Equity; and,
  - 2.8 Asynchronicity.
3. To describe the level of the students' learning satisfaction in Physical Education in terms of:
  - 3.1 Course Structure/Organization;
  - 3.2 Learner Interaction;
  - 3.3 Student Engagement;
  - 3.4 Instructor Presence;
  - 3.5 Student Satisfaction; and,
  - 3.6 Perceived Learning.
4. To determine the significant relationship between:
  - 4.1 Teachers' digital skills and students' learning and satisfaction; and
  - 4.2 Students' experiences in computer-mediated instruction and students' learning satisfaction.
5. To determine if Teachers' digital skills and students' experiences in computer-mediated instruction influences the level of students' learning satisfaction in Physical Education.

To answer questions 4 and 5, the following hypotheses will be tested at a 0.05 level of significance:

1. There is no significant relationship between Teachers' digital skills and students' learning satisfaction in Physical Education.
2. There is no significant relationship between students' experiences in computer-mediated instruction and students' learning satisfaction in Physical Education.

3. There is no domain in Teachers' digital skills and students' experiences in computer-mediated instruction that influences students' learning satisfaction in Physical Education.

Numerous studies examine student satisfaction, but as far as the researcher knows, none have explored both teachers' digital proficiency and students' interactions in online Physical Education classes simultaneously. If pursued, this research could transform how online courses are developed. Furthermore, this study may influence educational institutions as teachers and policymakers strive to adjust to the changing educational environment. Evaluating the immediate effects of digitization in education is important, but it's also essential to consider its long-term impact on shaping the future of education, especially beyond times of crisis. By further exploring these elements, we can develop a more thorough comprehension of the many facets of digital learning and its ability to ensure education remains consistent and accessible during challenging times or when updating the teaching and learning approaches.

Moreover, it will form part of the related literature in researches that consider computer-mediated instruction as a permanent and/or emergency option. Higher Education Institutions which goals to provide quality instruction should have a full understanding towards the satisfaction level of the learners in using online platform or computer-mediated instruction (Sharif Nia, 2023). Also, promote self-assessment towards teachers' digital skills competence that will in turn help enhance their efficiency in teaching; as well as provide additional knowledge to the institution regarding the achievement of its academic success indicators in the alternative platform. Most of all, this aims to improve students' online learning experiences, and enhance their overall satisfaction with it. Additionally, this study may form part of the literature in researches along this area.

**II. METHODS**

**A. Research Respondents**

This research employs the Stratified Random sampling method, which involves selecting a sample from a

Distribution of Respondents

Teacher Education Department Courses	Number of Respondents
BEED	87
BSED-MATH	72
BSED-ENGLISH	58
BSED-SOCIAL STUDIES	79
Total	296

population divided into smaller sub-groups with common attributes such as courses and year level. The students who answered the questionnaire were from Davao de Oro State College-Maragusan school year 2023-2024, enrolled in PE subject, and are under the teacher education department.

The sample must reflect or represent their population so the researcher conducted with the target sample size of 200-300 respondents to provide an acceptable margin of error and fall before the mark of diminishing returns (Lohr, 2021). The overall total number of populations in both First year and Second year students in TED is 364. The researchers utilized Slovin's formula to calculate the sample size for the research. Slovin's formula is a mathematical equation that can be applied to calculate the sample size of a population. The equation  $n = \frac{N}{1 + Ne^2}$  gives the sample size  $n$  in terms of the population size  $N$  and the margin of error  $e$ . Out of the 364 Teacher Education students, a minimum of 296 sample respondents are required.

The 296 respondents of this study are randomly selected through the following criteria: (1) they are enrolled in Physical Education subject, (2) they are a student of Davao de Oro State College-Maragusan under Teacher Education Department (TED), and (3) they agreed to participate in this study.

There are (233) 1st years, and there are (131) 2nd year students. The numbers are a cumulative of 109 Bachelor in Elementary Education (BEED), 88 Bachelor of Secondary Education- Mathematics (BSED-MATH), 68 Bachelor of Secondary Education- English (BSED-ENGLISH), and 99 Bachelor of Secondary Education- Social Studies (BSED-SOCIAL STUDIES) students. The Teacher Education Department teaches Physical Education with the same description across all programs but not all departments.

Thus, students who did not qualify based on the following criteria: (1) they were not enrolled in PE Subject, (2) not under Teacher Education Department, and (3) they did not agree in participating on the study. Participation of the respondents in this study was strictly voluntary. Respondents are allowed to withdraw if they do not feel like participating or they felt like there is violation in their rights and privacy. The researcher ensured the participants that this research adheres to Data Privacy Act and pledges to put their privacy as top priority.

The study was conducted at Davao De Oro State College-Maragusan. It is the most distant of the 3 branches from the main campus. Although there may be resemblances in traits, the results and applicability can be regulated. It cannot be presumed that the findings are applicable to all campuses.

It is crucial to mention that Maragusan is susceptible to landslides and road closures caused by the removal of fallen debris. Online classes are more prominent at this campus compared to those with better geographical locations. Additionally, Teacher Education Department across all campuses does not utilize an institutional course description.

Davao de Oro State College (DdOSC) is a provincial state college located in Davao de Oro, Philippines. In 2013, Compostela Valley State College was founded under Republic Act No. 10598, incorporating Bukidnon State University's External Studies Units in the province.

It was given its current name in 2021 by Republic Act No. 11575, after the province was also renamed. The college is located in Compostela and has additional campuses in Maragusan, Montevista, and New Bataan.

Davao de Oro, also known as Davao de Oro Province, is a province in the Philippines situated in the Davao region of Mindanao. Nabunturan is the capital city. It was previously a part of Davao del Norte province until it became its own province in 1998.

From its inception until December 2019, the region was officially identified as the Compostela Valley (Cebuano: Kawalogang Kompostela, also referred to as ComVal) before the referendum made it official.

Davao de Oro spans 4,479.77 square kilometers (1,729.65 sq mi) and is located in the northeastern section of the Davao region.

Davao Bay is situated to the southwest, while Davao del Norte is to the west, Agusan del Sur to the north, and Davao East to the east. Davao de Oro is split into two districts which consist of 11 municipalities, with Maragusan being the focus of the study.

**B. Materials and Instrument**

The researcher obtained, customized, and adjusted the questionnaires as a tool that became widely embraced for effectively collecting data to address specific research issues.

In order to improve the reliability and validity of the research and maintain consistent results, a pilot test was carried out at a tertiary institution that was not part of the study's identified respondents. Following that, the participants were given the survey to fill out.

To determine the level of Teachers' digital skills, the researcher adapted and modified a questionnaire crafted by (Al Khateeb, 2017).

The Digital Skills questionnaire included the following indicators: information and data literacy, communication, content creation, safety, and problem solving. The questionnaire measures the level of Teachers digital skills relevant to instruction.

Rated using a 5-point Likert scale that relate to Teachers' digital skills; Always-5, Often-4, Sometimes-3, Seldom-2, Never-1. The parameters of limits for the first independent variable are as follows:

Range of Means	Descriptive Equivalent	Interpretation
4.20 – 5.00	Very High	This means that the Digital skill is very highly manifested.
3.40 – 4.19	High	This means that the Digital skill is highly manifested.
2.60 – 3.39	Moderate	This means that the Digital skill is moderately manifested.
1.80 – 2.59	Low	This means that the Digital skill is manifested at low level.
1.00 – 1.79	Very Low	This means that the Digital skill is manifested at very low level.

To determine the Student's Experiences in computer-mediated instruction, the researcher employs the OLES – Online Learning Environment Survey questionnaire crafted by (Northcote, et. Al. 2019).

The questionnaire asks you to provide feedback on your experiences in computer-mediated instruction in terms of: computer usage, teacher/lecturer support, Student Interaction & Collaboration, Personal Relevance, Authentic Learning, Student Autonomy, Equity, and Asynchronicity.

It uses the scale: Always-5, Often-4, Sometimes-3, Seldom-2, Never-1. The parameters of limits for the second independent variable are as follows

Range of Means	Descriptive	Interpretation
	Equivalent	
4.20 – 5.00	Very High	This means that experiences in computer-mediated instruction is manifested at Very High level.
3.40 – 4.19	High	This means that experiences in computer-mediated instruction is manifested at high level.
2.60 – 3.39	Moderate	This means that experiences in computer-mediated instruction is manifested at moderate level.
1.80 – 2.59	Low	This means that experiences in computer-mediated instruction is manifested at low level.
1.00 – 1.79	Very Low	This means that experiences in computer-mediated instruction is manifested at very low level.

To determine the level of student’s learning and satisfaction, the researcher adapted and employs the questionnaire created by Strachota, (2003) cited by Torrado, (2021). The questionnaire is entitled The Online Student Satisfaction Survey. This questionnaire assesses your satisfaction and perceived learning in online environments based upon the following constructs: course organization/structure, learner interaction, student engagement, instructor presence, student satisfaction, and perceived learning.

The instrument used a Likert scale of 1-5 with (5) strongly agree, (4) moderately agree, (3) sometimes agree/disagree, (2) moderately disagree, and (1) strongly disagree.

The parameters of limits for the first and second independent variable are as follows:

Range of Means	Descriptive	Interpretation
	Equivalent	
4.20 – 5.00	Very High	This means that Very High level of learning satisfaction is very much manifested.
3.40 – 4.19	High	This means that High level of learning satisfaction is very much manifested.
2.60 – 3.39	Moderate	This means that moderate level of learning satisfaction is very much manifested.
1.80 – 2.59	Low	This means that low level of learning satisfaction is very much manifested.
1.00 – 1.79	Very Low	This means that very low level of learning satisfaction is very much manifested.

A pilot testing of the questionnaire was conducted with 50 students through online survey form. Results of the reliability test shows that all questionnaires are higher

than the standard threshold of 0.70. The questionnaire Digital skills has 0.909 Cronbach Alpha which has an excellent internal consistency. Similarly, Students’ Experiences in computer-mediated Instruction has 0.947 Cronbach Alpha which also indicates an excellent internal consistency. On the other hand, Students’ Learning Satisfaction has 1.029 Cronbach Alpha which also suggests an excellent internal consistency. The results are not far from the summary of rating given by the internal and external validators which is Very Good.

**C. Design and Procedures**

Quantitative non-experimental research design is a method of studying social phenomena without manipulating the subjects' conditions directly. Subjects are not randomly assigned to different groups. As such, evidence that supports the cause-and-effect relationships is largely limited (Mucherah, 2018). Quantitative non-experimental research design can be used to describe or predict statistical relationships between variables, such as the correlation between Teachers’ Digital Skills and students’ learning satisfaction, or to explore what it is like to have a particular experience, such as a student who experience computer-mediated instruction (Cutler, 2019).

While collecting data for the study, the researcher adheres to a set of procedures. Initially, the researcher presented a structured defense where the manuscript was reviewed by the panel. Evaluation of questionnaires was also conducted as well as consolidating and employing the feedback from both internal and external validators. Afterward, the researcher emailed the required paperwork to the UM Ethics Review Committee (UMERC).

Once the researcher met their requirements, UMERC sent the certificate of approval via email. Following the successful completion of reliability testing, the researcher obtained both a letter of permission and certification from the Graduate School of University of Mindanao Tagum College and the college directors/deans to validate the research study. Following that, the researcher distributed the survey themselves through a Google Form sent to the participants. Thirdly, in order to guarantee the accuracy of the required data, the researcher provided clear and straightforward guidelines to guide the respondents. It took a minimum of one month to collect enough responses. The collected information was then organized, examined, and explained with the assistance of an approved statistician and the recommended tools.



Mean was employed to assess the teacher's digital skills, the students' familiarity with computer-mediated instruction, and the students' level of satisfaction with their learning.

Pearson-r was utilized to explain the important correlation between teachers' digital skills and students' experiences in computer-mediated instruction in Physical Education, which contributed to students' learning satisfaction. Multiple Regression Analysis was employed to investigate the impact of Teachers' digital skills and Students' computer-mediated instruction experiences on students' satisfaction with learning in Physical Education.

Aligned to the ethical standards in every research: to promote the trust and respect of the public and the scientific community towards the research; to prevent or minimize the potential harm or risks to the subjects, researchers, or society, this study specified the fundamental moral standards relevant to the ethics of research involving human subjects. The researcher undergone due process and complied to the necessary ethical considerations stipulated in the issued UMERCC Certification under UMERCC Protocol No. UMERCC-2024-024.

### III. RESULTS AND DISCUSSIONS

#### *Level of PE Teachers' Digital Skills*

The Table 1 below shows the level of Teachers' digital skills in terms of various indicators. The overall mean is 4.60 and standard deviation of 0.51 with descriptive equivalent, very high.

This means that the teachers have very high level digital skills as reported by the student respondents related to information and data literacy, communication, content creation, safety, and problem solving.

Specifically, five indicators are listed from highest to lowest mean as follows: communication got the highest mean which is 4.67 and standard deviation of 0.44 indicating very high communication skills among PE Teachers; 4.63 and standard deviation of 0.52, indicates very high level content-creation skills; 4.60 mean with 0.51 standard deviation still very high safety skills; 4.59 with standard deviation of 0.52 still described as very high information and data literacy skills; and, problem-solving got a mean of 4.55 and standard deviation of 0.55 still has a very high descriptive equivalent.

Table 1

Level of Teachers' Digital Skills

INDICATORS	MEAN	SD	DESCRIPTIVE EQUIVALENT
Information and Data Literacy	4.59	0.52	Very High
Communication	4.67	0.44	Very High
Content Creation	4.63	0.52	Very High
Safety	4.60	0.51	Very High
Problem Solving	4.55	0.55	Very High
OVERALL	4.60	0.51	Very High

In the results, it was found that Communication is the indicator in Teachers digital skills was always manifested. This indicates that the teachers handling the subject Physical Education always communicate, share resources, link and collaborate through digital tools, interact with and participate in communities and networks in an online environment as observed by their students. This means that the students believe that their teachers are trained in digital skills necessary to a successful computer-mediated learning environment. They are competent enough to handle digital tools and knowledgeable enough to show proper use of internet as a tool in teaching. In the context of the move towards online and blended learning, it is especially important to be able to effectively use digital platforms as it can greatly affect the quality of education provided.

Followed by content-creation, also serving a very high descriptive equivalent. This shows that teachers consistently demonstrated the skill to generate and modify new material across various formats, including word processing, presentations, images, and videos. The ability of teachers to create engaging and relevant content can lead to improved learning outcomes, as it allows for the incorporation of real-world applications and promotes critical thinking skills.

Next, safety also yielded very high descriptive equivalent which suggests that teachers always showed their knowledge of internet safety which enable them to create an online learning experience that is engaging, safe, supportive, and aligned with students' needs and expectations, ultimately leading to greater learning satisfaction. Educators with a strong grasp of internet safety can offer students direction on safely and responsibly maneuvering the online environment.

Another, Information and data literacy, also has a very high descriptive equivalent. This indicates that the teacher always showed very high-level skills in searching and utilizing information online. Information

skill is crucial in students' learning satisfaction. By enhancing their digital skills, educators can establish more captivating, efficient, and learner-focused educational settings that encourage increased levels of contentment and academic success.

Lastly, the indicator problem solving has the lowest mean but still has a very high descriptive equivalent. This indicates that teachers always showed very high level of problem-solving skills regarding technical issues. Teachers who can fix technical problems and help students, making sure learning is smooth and frustrations are minimized to maintain satisfaction.

The level of Teachers digital skills was very high. This indicates that the teachers handling the subject Physical Education manifested very high level of digital skills as observed by their students. The results are consistent to a study by (Lapada et al., 2020), stating that the proficiency of teachers in digital skills is a significant factor that can influence students' learning satisfaction. This is supported by (Li and Yu, 2022) stating that when educators are adept in utilizing digital tools and resources, they can create more engaging, diverse, and interactive learning environments.

In terms of communication, the level of digital skills is very high. This indicates that teachers demonstrated very high digital skills in terms of communication. (Chu et al 2020) stated that effective communication is a cornerstone of educational success and student satisfaction.

In terms of content-creation, the level of digital skills is also very high. This indicates that teachers showed very high content-creation skills. These findings are supported in the research conducted by Instefjord E. et al. (2017) stating that, effective content creation by teachers can lead to improved learning outcomes, as it allows for the incorporation of real-world applications and promotes critical thinking skills.

In terms of safety, the level of digital skills was also very high which suggests that teachers' knowledge of internet safety meets students' expectations. (Brown, 2023) said when teachers have a good understanding of internet safety, they can provide guidance to students on how to navigate the online world safely and responsibly.

In terms of Information, the level of digital skills among teachers was also has a very high. This indicates that the teacher showed very high-level skills in searching and

utilizing information online. Agreed by (Kim et.al, 2021), information skill is crucial in students' learning satisfaction. Teachers can enhance student engagement, effectiveness, and centrality by enhancing their digital skills, resulting in increased satisfaction and academic success in learning environments.

Followed by the indicator problem solving, the level of digital skills was very high. Which indicates that teachers showed very high level of problem-solving skills regarding technical issues. (Napal et.al, 2018) teachers who are able to troubleshoot technical issues and provide support to students, ensuring a smooth learning process and reducing frustrations that could negatively affect satisfaction.

Overall, the study's results indicate that teachers possess a very high level of digital skills, significantly influencing their learning satisfaction in Physical Education.

### *Level of Students' Experiences in Computer-mediated Instruction*

The Table 2 below shows the mean scores of various indicators in students' experiences in computer-mediated instruction. The overall mean is 4.42 thus reflecting very high-level descriptive equivalent. The standard deviation 0.58 indicates the consistent high ratings across all indicators. This means that the students have very high level of experiences in computer-mediated instruction in terms of Computer Usage, Teacher/Lecturer Support, Student Interaction and Collaboration, Personal Relevance, Authentic Learning, Student Autonomy, Equity, Asynchronicity.

Eight indicators as listed from highest to lowest, as follows: first being 4.55, indicating very high level of experience in authentic learning with standard deviation, 0.53; 4.53 described as very high level of equity felt by students with standard deviation of 0.54; 4.52 described as very high level of student autonomy with standard deviation, 0.53; 4.49 still a very high level of teacher/lecturer support with standard deviation of 0.52; 4.43 still very high level of personal relevance with standard deviation of 0.56; 4.36 indicates very high level Student Interaction and Collaboration with standard deviation, 0.68; 4.34 signifying high level of Asynchronicity with standard deviation, 0.65; and, 4.24 indicates very high level of computer usage with standard deviation of 0.64.

Table 2

Level of Students' Experiences In Computer-mediated Instruction

INDICATORS	MEAN	SD	DESCRIPTIVE EQUIVALENT
Computer Usage	4.24	0.64	Very High
Teacher/Lecturer Support	4.49	0.52	Very High
Student Interaction and Collaboration	4.36	0.68	Very High
Personal Relevance	4.43	0.56	Very High
Authentic Learning	4.55	0.55	Very High
Student Autonomy	4.52	0.53	Very High
Equity	4.53	0.54	Very High
OVERALL	4.42	0.68	Very High

Authentic Learning yielded the highest mean score indicating that it is the most prominent indicator that was always observed in students' experiences on computer-mediated instruction. This means that students always prefer activities that relate to real-life situation. They are more satisfied when activities and assignments relate to real life experiences.

The Equity indicator is also has very highly prevalent among students. Respondents responded positively to the level of attention, opportunities and recognition given to each student by the teacher. This indicates that fairness in classroom is also very important in the success of computer-mediated instruction. This further suggests the importance of fairness towards all students in terms of attention and grading their assessment.

Following this, Student Autonomy obtained the third highest mean among the indicators of students' experiences in computer-mediated instruction. Respondents demonstrated a favorable response towards their experience in their learning when they are in control with their own learning and are able to learn according to their preferences.

Next is the indicator, teacher/lecturer support still has a very high descriptive equivalent. This indicates that students reacted positively to the way students and teachers interacted and provided feedback. Students are more content when teachers offer prompt feedback on student performance. Otherwise, late feedback tends to weigh less as much significance.

The indicator Personal relevance also has a very high descriptive equivalent. This suggests a positive response among respondents in the feeling of value that they give

to their learning experiences. This means that they recognize the importance of the lesson their lives.

Another indicator, student interaction and collaboration got a very high descriptive equivalent signifying the favorable response of students in their experiences when interacting with co-students. Students prefer to have group activities than tackling a somewhat difficult task alone.

Next, Asynchronicity is also an indicator with a very high descriptive equivalent. This suggest that students have a favorable response in their experience choosing between synchronous and asynchronous classes. Students' situation varies from one to another, students who are working tend to be more satisfied with computer-mediated instruction because time is flexible.

Lastly, Computer usage despite having the lowest mean, still yielded a very high descriptive equivalent. This means that students have a favorable response in their experiences in how much use of technology is being utilized in the instruction. Some students confided to prefer computer-mediated instruction but face-to-face submission of written outputs. However, they prefer to submit via video, those outputs that requires performance like a dance and/or exercises.

Results indicates that students have a very high-level experiences in computer-mediated instruction. This means that computer-mediated instruction that is well-designed, facilitates active learning and discussion, and promotes social presence tends to lead to high levels of student satisfaction. The level of students' experiences in computer-mediated instruction can significantly influence their learning satisfaction. High-quality online learning experiences are often characterized by interactive and engaging content, which can lead to increased student satisfaction. Studies have shown that when students are actively engaged and find the online learning environment to be supportive and user-friendly, their satisfaction levels tend to be higher (Salas-Pilco, 2022).

In terms of Authentic learning, result of this research indicates that a high level of authentic learning correlates with increased student satisfaction, particularly when students can engage with the content and apply what they learn to practical scenarios. Similarly, (Sharif Nia, 2023) reported that authentic learning experiences in computer-mediated instruction not only make the learning process more enjoyable but

also contribute to better academic outcomes, thereby enhancing overall student satisfaction.

Regarding Equity, findings suggest that Equity in computer-based teaching has a significant impact on students' satisfaction with their learning experience. This study proposes that fair learning takes place when each student feels included, participates, and succeeds, regardless of their socio-economic status or background. The study of (Tate et al. 2022) have shown that addressing equity concerns in online learning can lead to improved student performance, reduced performance gaps, and increased satisfaction with online courses.

In terms of Student Autonomy, this data indicates that students experienced very high sense of autonomy in their learning process using computer-mediated instruction. Autonomy allows students to have the freedom to be in charge of their learning by deciding on the content, speed, and method of their education. This feeling of authority can result in enhanced drive and involvement, which are essential elements of contentment. Research of (Mohammadi et.al, 2023) has shown that when students feel autonomous, they are more likely to be engaged both cognitively and behaviorally in their learning environment.

Regarding Teacher/Lecturer Support, research suggests it plays a vital role in impacting student contentment in computer-mediated instruction. Findings reveal that when teachers offer prompt and efficient assistance, students are more inclined to be actively involved and content with their educational journey. This assistance can come in different ways, like offering clear guidance, prompt responses, and addressing student questions promptly. Additionally, the presence of strong lecturer support has been found to moderate the relationship between new ways of learning and student engagement, which in turn affects learning satisfaction as stated by (Abbas, 2018). It is crucial to understand that students' views on their learning can be greatly influenced by the quality of teacher support, which may impact their overall success in the class.

When it comes to personal relevance, it plays a crucial role in determining students' satisfaction with their learning. Students are more likely to be engaged and satisfied with their learning experience when they view course content and activities as pertinent to their personal interests, career aspirations, or real-world relevance. Research of (Dela Cruz et al. 2019) has shown that personal relevance can enhance motivation,

which in turn improves learning outcomes and satisfaction.

In terms of Student interaction and collaboration, result indicates that the domain is pivotal in enhancing learning satisfaction in computer-mediated instruction. Result indicates that when students engage in meaningful interactions and collaborative tasks, they experience higher levels of satisfaction with their learning experience. According to (Mohammadi et.al, 2023) effective computer-mediated instruction requires careful design that promotes interactions.

Asynchronicity enables students to interact with educational materials at their own speed, impacting their satisfaction with the learning process. Result of this study have shown that asynchronous learning environments can support student autonomy and cater to individual learning styles, which are critical factors in student satisfaction. This was backed-up by (Fabríz et.al, 2021) who claimed that asynchronous settings can provide flexibility that accommodates diverse schedules, potentially reducing stress and increasing contentment with the learning process.

In terms of Computer Usage, it has a significant impact on students' learning satisfaction in computer-mediated instruction. A study conducted by (Simões, 2022) found a positive correlation between student satisfaction and engagement in an online course, suggesting that technology can aid students in the learning process. These findings suggest that while computer usage in education can improve learning satisfaction, but it is also essential to consider factors such as learning design, student support, and the use of learning analytics to optimize student experiences.

Overall, the study's results indicate that students experience a very high level of experiences in computer-mediated instruction, significantly influencing their learning satisfaction.

### ***Level of Students' Learning Satisfaction in Physical Education***

The table 3 below shows the mean scores of various indicators of students' learning satisfaction. The overall mean is 4.78 and standard deviation of 0.53, described as very high. The very high level is attributed to the consistent rating of respondents across all indicators. This means that all respondents are very satisfied with their learning in terms of Course Structure/Organization, Learner Interaction, Student Engagement,

Instructor's Presence, Student Satisfaction, and Perceived Learning.

The specific mean scores, listed from highest to lowest, are as follows: 4.83 indicating a very high level Course Structure/ Organization with standard deviation of 0.51; 4.82 indicating very high level perceived learning with standard deviation of 0.56; 4.81 indicates very high level of student satisfaction with standard deviation of 0.55; 4.79 indicates very high level of instructors' presence with standard deviation of 0.57; 4.76 indicates very high level of learner interaction with standard deviation of 0.46; and, 4.72 indicates a very high level of student engagement with standard deviation of 0.53.

Table 3  
Level of Students' Learning Satisfaction In Physical Education

INDICATORS	MEAN	SD	DESCRIPTIVE EQUIVALENT
Course Structure/ Organization	4.83	0.51	Very High
Learner Interaction	4.76	0.46	Very High
Student Engagement	4.72	0.53	Very High
Instructor's Presence	4.79	0.57	Very High
Student Satisfaction	4.81	0.55	Very High
Perceived Learning	4.82	0.56	Very High
OVERALL	4.78	0.53	Very High

The highest level of students' learning satisfaction is course structure/organization. It indicates that most students strongly agree that with well-structured content and well-defined goals they feel more satisfied in learning. It was found in the study that students learning outcomes in computer-mediated instruction was aligned with the learning objectives.

Perceived Learning was also emphasized in students' satisfaction. This means that students are pleased with what they learned in the course. These learnings are also highly anticipated and seen to contribute greatly in students' professional development.

Following this, Student Satisfaction also has a very high descriptive equivalent. This indicates that students perceive their learning experiences as satisfactory. When students feel satisfied with the overall learning experience, they perceive the subject as important.

Next, Instructor's Presence has a very high descriptive equivalent. This means that students respond positively to courses that utilizes a variety of methods that promote

positive interactions between teachers and students. Feedbacks that are constructive and timely are favored.

Then, Learner Interaction also has very high descriptive equivalent. This means that students feel very highly satisfied with their interaction with other students and with their teachers. They do not feel disconnected at all as interaction was also very highly promoted.

Lastly, student engagement has a very high descriptive equivalent. This indicates that students responded positively on their interaction with their teacher in the course. They also are able to talk freely about the subject outside the class which is a common topic in learner interaction.

Overall, the students' learning satisfaction in Physical Education has a very high descriptive equivalent. This means that students strongly agree that the subject Physical Education was offered very satisfactorily even in the alternative platform.

In terms of the course structure/organization, it pivotal in enhancing student learning satisfaction, especially in online learning environments. According to Telli et al. (2022) a well-structured course provides a clear roadmap for students, outlining the learning objectives, materials, assignments, and assessments, which can significantly influence their academic achievement and satisfaction.

In terms of perceived Learning, agreeing results was yielded from this study, which was when students feel they have learned effectively, their satisfaction with the learning process increases. As stated by, Butt et al. (2023), Perceived learning plays a crucial role in students' overall satisfaction with their educational experience. They further stated that it encompasses students' subjective evaluation of what they believe they have learned from a course or program.

In terms of Student Satisfaction, High levels of student satisfaction contribute to a positive learning environment, which can enhance academic performance and foster personal growth agreed by Kanwar et al. (2022).

In terms of Learner Interaction, high level learner engagement can result in heightened motivation, better communication proficiency, and enhanced critical thinking and problem-solving capabilities. According to Kumar et al. (2021), it opens avenues for collaborative learning among peers, cultivating a more inclusive and

encouraging academic environment consequently boosting student contentment levels and enhancing overall learning achievements.

In terms of Student Engagement, it was found that students who are actively engaged tend to assume accountability for their education, resulting in enhanced academic achievement and a more profound grasp of the subject matter agreed by Sharif et al. (2023).

The results align with the study of (Ikhsan et al., 2019) that stated student satisfaction is an important part of education and a major concern in the transition from face-to-face learning to computer-mediated instruction. Students recognize that these factors are essential for positive learning success and their satisfaction.

**Significance on the Relationship between Digital Skills and Students’ Learning Satisfaction**

In this analysis, Table IV presents the results of the study conducted to examine the relationship between various factors of Teachers’ Digital skills and students’ learning satisfaction. The correlation between two variables was determined using Pearson-r presented also in the table.

The results show that the R-values being in the range of 0.275-0.332 suggests that there is a weak positive correlation between teachers’ digital skills and students’ learning satisfaction. The p-values (0.001) being lower than 0.05 suggests that each of these factors contributes to overall satisfaction with the learning experience. Hence, null hypothesis “There is no significant relationship between Teachers’ digital skills and students’ learning satisfaction” was rejected.

Table IV  
Significance on the Relationship between Digital Skills and Students’ Learning Satisfaction

IV	DV	r-value	r <sup>2</sup>	p-value	Decision
Information		0.275	0.076	0.001	Ho rejected
Communication		0.317	0.100	0.001	Ho rejected
Content Creation	Learning	0.332	0.110	0.001	Ho rejected
Safety	Satisfaction	0.310	0.096	0.001	Ho rejected
Problem Solving		0.291	0.085	0.001	Ho rejected

The findings suggest that the quality of interaction, communication, content creation, safety measures, and problem-solving weakly influenced the students’ learning satisfaction. Consequently, these findings conform to the study’s claim that students’ learning satisfaction is positively correlated with teachers’ digital skills. However, other factors that greatly influencing the student satisfaction may not be part of teachers’

digital skills. Factually, the statistical analysis of the relationship between teachers’ digital skills and students’ learning satisfaction provides a clear mandate for the proficiency of digital skills into teacher education. When teachers are digitally skilled, students develop digital skills and are more satisfied with their learning experience, (Fransson and Norman, 2021).

**Significance on the Relationship between Students’ Experiences on Computer-mediated Instruction and Students’ Learning Satisfaction**

Based on the data presented in the table V below, it can be concluded that there is a positive relationship between the variables of students’ experiences in computer-mediated instruction and learning satisfaction among students.

The R-values of personal relevance (0.4150) and asynchronicity (0.403) indicate a moderately strong positive correlation towards learning satisfaction. However, other indicators which R-values ranges from 0.278-0.369 suggests a weak positive correlation. Additionally, the p-values being (0.001) are less than 0.05, indicating that the null hypothesis “There is no significant relationship between students’ experiences in computer-mediated instruction and students’ learning satisfaction” was rejected for each of these relationships.

Table V  
Significance on the Relationship between Students’ Experiences in Computer-Mediated Instruction and Students’ Learning Satisfaction

IV	DV	r-value	r <sup>2</sup>	p-value	Decision
Computer Usage		0.304	0.092	0.001	Ho rejected
Teacher/Lecturer Support	Learning	0.278	0.077	0.001	Ho rejected
Student Interaction and Collaboration	Satisfaction	0.369	0.136	0.001	Ho rejected
Personal Relevance		0.415	0.172	0.001	Ho rejected
Authentic Learning		0.307	0.094	0.001	Ho rejected
Student Autonomy		0.299	0.089	0.001	Ho rejected
Equity		0.356	0.127	0.001	Ho rejected
Asynchronicity		0.403	0.162	0.001	Ho rejected

The findings showed a relevant degree of positive correlation between students’ experiences in computer-mediated instruction and students’ learning satisfaction in terms of personal relevance and asynchronicity. These findings conform to the study’s claim that students’ learning satisfaction is positively correlated with students’ experiences in computer-mediated instruction.

Furthermore, computer-mediated instruction has varying levels of effectiveness on student satisfaction, results showed that Personal relevance particularly influence learning satisfaction. Consistent to the result of the study conducted by (Tolentino et. Al, 2023) that when students link its learnings to life outside the class, students' satisfaction also increases. Additionally, when students perform tasks according t personal pace and time convenience, students feel more satisfied about learning. This suggests that as each indicator increases in level, the learning satisfaction also increases. Therefore, it can be inferred that computer-mediated instruction plays a significant role in influencing the various aspects of the learning satisfaction in Physical Education. However, other indicators that shows weak positive correlation suggests that other factors not related to the study may be affecting students' satisfaction.

**Regression Analysis on Teachers' Digital Skills and Students' Learning Satisfaction**

Presented in the Table VI below the compelling statistical evidence on the influence of teachers' digital skills towards students' learning satisfaction. The Multiple Regression Analysis yielded an F-ratio of 8.232 with p-value of 0.001. R-value of 0.351 suggests a weak positive correlation, meaning teachers' digital skills influences the students' learning satisfaction but not as strongly as other factors. The result suggests that the independent variable, teachers' digital skills, is influencing the dependent variable, students' learning satisfaction since the probability value is less than 0.05. The R2 value of 0.123 suggests that 12.3% of variation in students' learning satisfaction can be attributed to teachers' digital skills, while the remaining 87.7% are from other factors.

Table VI  
Regression Analysis on Teachers' Digital Skills and Students' Learning Satisfaction

IV	Unstandardized coefficients		Standard Coefficients	t	p-value	Decision
	B	Std. Error	Beta			
Constant	3.083	0.282				
Information	-0.0001	0.084	-0.00018	-0.001	0.999	Ho not rejected
Communication	0.123	0.108	0.114	1.138	0.256	Ho not rejected
Content Creation	0.167	0.085	0.183	1.962	0.051	Ho not rejected
Safety	0.041	0.109	0.044	0.379	0.705	Ho not rejected
Problem Solving	0.038	0.083	0.044	0.455	0.650	Ho not rejected

> < 0.05    R = 0.351    R<sup>2</sup> = 0.123    F = 8.232    p-value = 0.001

While examining the various indicators of teachers' digital skills, no particular domain significantly influences students' learning satisfaction. Thus, the null hypothesis "There is no domain in teachers' digital skills that influences the students' learning satisfaction" is not rejected. However, it has a considerable influence if taken as a whole. It emphasizes the importance of holistically acquiring digital skills, not just knowing a little of its parts to effectively impact students' learning satisfaction.

As previously discussed, outcomes of the study align with the proposition of Almusharraf et al (2020), who emphasized that digital skills, knowledge, and digital relationships are significant in teaching. Additionally, students advance their digital competencies by learning technologically proficient teachers, through modeling. Results of the study indicate that students are more satisfied with their education when their teachers possess strong digital abilities.

**Regression Analysis on Students' Experiences on Computer-mediated Instruction and Students' Learning Satisfaction**

The Table VII shows that the f-ratio 10.221 and the p-value is 0.001, suggest a statistically significant relationship between students' experiences in computer-mediated instruction and students' learning satisfaction. The R-value of 0.469 indicates a moderate positive correlation between students' experiences in computer-mediated instruction and students' learning satisfaction. This allows the researcher to reject the null hypothesis "There is no significant relationship between students' experiences in computer-mediated instruction and students' learning satisfaction". Meanwhile, the R2 value of 0.220 suggests 22% of variation in students' learning satisfaction can be attributed towards students' experiences in computer-mediated instruction.

Upon examining the individual indicators, it was found that two of them significantly influences students' satisfaction. Student Interaction and Collaboration and Asynchronicity has p-value not greater than the standard threshold 0.05 suggests that only these two domains particularly influence the students' learning satisfaction among eight that are presented. This allows the researcher to reject the null hypothesis "There is no domain in students' experiences in computer-mediated instruction that influences students' learning satisfaction" in this particular independent variable. This means that when students are more engage and in

collaboration with each other, and still work on their own pace, they tend to be more satisfied with their learning. On the other hand, the p-values of the other domains shows greater values than the common threshold of 0.05 which suggests to not reject the null hypothesis.

Table VII  
Regression Analysis on Students' Experiences on Computer-mediated Instruction and Students' Learning Satisfaction

IV	Unstandardize d coefficients		Standard Coefficients		p-value	Decision
	B	Std. Error	Beta	t		
Constant	3.02	0.245				
Computer Usage	0.036	0.051	0.049	0.699	0.485	Ho not rejected
Teacher/Lecturer Support	-0.042	0.061	-0.053	-0.697	0.487	Ho not rejected
Student Interaction and Collaboration	0.114	0.047	0.164	2.414	0.016	Ho rejected
Personal Relevance	0.137	0.085	0.163	1.603	0.110	Ho not rejected
Authentic Learning	0.028	0.065	0.033	0.431	0.667	Ho not rejected
Student Autonomy	-0.074	0.076	-0.084	-0.984	0.326	Ho not rejected
Equity	0.063	0.080	0.071	0.778	0.437	Ho not rejected
Asynchronicity	0.146	0.061	0.203	2.375	0.018	Ho rejected

\*p<0.05 R =0.488 R<sup>2</sup> =0.220 F=10.221 p-value =0.001

The result of the regression analysis presented suggests that both teachers' digital skills and students' experiences in computer-mediated instruction are predictors of students' learning satisfaction. However, result suggests that teachers with high level of digital skills increases the students' learning satisfaction in the subject they are teaching but not as strong as students' experience in computer-mediated instruction.

The result of this study is supported by the findings of Simonson (1999) on his Equivalency Theory. It posits that educational experiences should be equivalent, not necessarily identical, across different learning environments. The result of this research showed that when online instruction is planned and conducted by Teachers with very high-level digital skills, students also has very high-level experiences in computer-mediated instruction to which may equate the level of learning satisfaction if not more than traditional methods. Another study developed by (Kolb et al 2017) supports the current research. Experiential Learning Theory as explained by (Kong, 2021) is a significant educational framework that emphasizes the central role of experience in the learning process. In other words, high level experiences impact the level of students' satisfaction in the learning process. Finally, Bandura's Social Cognitive Theory (1977) further supported the

findings in this study. As explained by (Tadyayon et al, 2012) when teachers show very high-level digital skills, students also show high-level of acquired digital skills. Therefore, students feel more satisfied in their learning when teachers are highly skilled in using computer-mediated instruction.

#### IV. CONCLUSION AND RECOMMENDATION

##### Conclusion

Referring back to the result of this study, the researcher concluded that the level of digital skill among teachers are very high. Teachers are assessed as very high in Information and data literacy, very high in Communication, very high in Content Creation, very high in Safety, and very high in Problem Solving. Overall mean indicates a very reasonable level of digital skills. It suggests that digital skill is always manifested by teachers. On the other hand, the level of Students' experiences in Computer-mediated Instruction are also very high. Students' experiences are assessed as very high in Computer Usage, very high in Teacher/Lecturer Support, very high in Student Interaction and Collaboration, very high in Personal Relevance, very high Authentic Learning, very high in Student Autonomy, very high in Asynchronicity, lastly very high in Equity. It implies that students' experiences in computer-mediated instruction are always manifested.

In terms of students' learning satisfaction, study reveals a very high of course structure/organization, very high of learner interaction, very high student engagement, very high instructor's presence, very high level of student satisfaction, and very high perceived learning. The overall mean indicates a very high level of students' learning satisfaction. It shows that all aspects in students' learning satisfaction are very highly satisfactory.

The study also indicates weak correlation with digital skills. No domain in digital skills significantly influence students' satisfaction but has a considerable significance when taken as a whole. It indicates moderate correlation with students' experiences in computer-mediated instruction. Two domains of students' experiences particularly influence students' satisfaction namely student interaction and collaboration as well as asynchronicity. The outcomes mirror recent research conducted by (Li M and Yu Z., 2022) that highlighted the positive association between engaging with digital tools and both student contentment and academic achievements. As the educational environment progresses alongside technological advancements, the



significance of teachers' proficiency in digital skills is poised to play a crucial role in shaping the caliber of students' educational experiences.

### Recommendations

Upon thorough analysis of the results and findings of the study, the researcher made several recommendations as to how to maintain the very high-level digital skills among teachers in terms of utilizing digital platforms and computer-mediated instruction.

First, Conduct of Digital Competence Training/Workshop based on Self-Assessment Tool. Teachers as recognized models in teaching, significantly impacts student learning. In the digital age, where technology permeates every aspect of life, equipping teachers with the necessary digital competencies is crucial. Digital competence training for teachers can lead to improved professional engagement, better organization of teaching activities, enhanced assessments, and empowerment of learners. It also prepares students to deal with ongoing technological changes in society and the workplace, fostering higher-order thinking skills and providing individualized learning opportunities. Therefore, the conduct of digital skills training for teachers is not just a supplementary aspect of education but a fundamental component that directly correlates with the quality and relevance of students' learning experiences.

Second, The Institution must craft a Continuity Learning Plan/Manual. In times when calamities or pandemic occurs in the future, or simply as alternative platform due to various constraints (time, classroom) this plan will serve as guide for teachers as to how instruction should be delivered online. To ensure that the implementation of computer-mediated instruction meets the institutions' quality standards. Qualifications of teachers in terms of digital competence must be aligned accordingly. This will help teachers lessen their time of preparation in times of abrupt shift from face-to-face, and students' learning satisfaction will be maintained.

Finally, this recommends future researchers to explore another independent variable to further discuss factors that could influence students' learning satisfaction. This will never be an overrated topic because above all important measure of effective teaching, students' learning satisfaction is top priority.

### ACKNOWLEDGMENT

The researcher extends her profound gratitude and sincerest appreciation to all who contributed immensely

in the accomplishment of this research. To the God, thank you for your unwavering guidance and divine wisdom bestowed upon her throughout this scholarly endeavor. To the esteemed panel of experts, whose incisive critiques and invaluable insights have significantly shaped the contours of this research, I am eternally indebted. My research adviser Dr. Saramie S. Belleza, a beacon of intellectual rigor has been the cornerstone of this journey, providing steadfast mentorship and support. The contributions of the statistician Dr. Noel T. Casocot, who meticulously navigated the complex tapestry of data, are acknowledged with great respect. To the grammarian, whose keen eye and masterful command of language have refined this work to its current luster, deserves special mention. To my family, beloved Cy, and friends who motivated through emotional and practical support. Finally, To Davao De Oro State College, thank you for extending your support. You played an indispensable impact in the fruition of this study, and it is with heartfelt acknowledgment that your collective efforts are celebrated.

### REFERENCES

- [1] Abbas, Zainab Ibrahim (2018). Blended Learning and Student Satisfaction: An Investigation into an EAP Writing Course. <https://files.eric.ed.gov/fulltext/EJ1169418.pdf>
- [2] Abuhassna, H., Al-Rahmi, W.M., Yahya, N. et al. Development of a new model on utilizing online learning platforms to improve students' academic achievements and satisfaction. *Int J Educ Technol High Educ* 17, 38 (2020). <https://doi.org/10.1186/s41239-020-00216-z>
- [3] Al Khateeb, Ahmed. (2017). Measuring Digital Competence and ICT Literacy: An Exploratory Study of In-Service English Language Teachers in the Context of Saudi Arabia. *International Education Studies*. 10. 38. 10.5539/ies.v10n12p38.
- [4] Ala-Mutka, K. Institute for Prospective Technological Studies. 2021. Mapping Digital Competence: Towards a Conceptual Understanding. Available online:[https://pdfs.semanticscholar.org/6282/f40a4146985cfef2f44f2c8d45fdb59c7e9c.pdf%0Ahttp://ftp.jrc.es/EURdoc/JRC67075\\_TN.pdf%5Cnftp://ftp.jrc.es/pub/EURdoc/EURdoc/JRC67075\\_TN.pdf](https://pdfs.semanticscholar.org/6282/f40a4146985cfef2f44f2c8d45fdb59c7e9c.pdf%0Ahttp://ftp.jrc.es/EURdoc/JRC67075_TN.pdf%5Cnftp://ftp.jrc.es/pub/EURdoc/EURdoc/JRC67075_TN.pdf)

- [5] Alagon, M. et al (2021) Online Learning Environment And Test Anxiety: Input To Guidance Testing Service Program For College Students In A Flexible Education System. 2021, Vol. 2 Issue 3, DOI No. – 08.2020-25662434
- [6] Almusharraf, N., & Khahro, S. (2020). Students Satisfaction with Online Learning Experiences during the COVID-19 Pandemic. *International Journal of Emerging Technologies in Learning (iJET)*, 15(21), pp. 246– 267. <https://doi.org/10.3991/ijet.v15i21.15647>
- [7] Amhag, L., Hellström, L., and Stigmar, M. (2019). Teacher Educators' Use of Digital Tools and Needs for Digital Competence in Higher Education. *J. Digital Learn. Teach. Educ.* 35 (4), 203– 220. doi:10.1080/21532974.2019.1646169
- [8] Amir, L.R., Tanti, I., Maharani, D.A. et al. Student perspective of classroom and distance learning during COVID-19 pandemic in the undergraduate dental study program Universitas Indonesia. *BMC Med Educ* 20, 392 (2020). <https://doi.org/10.1186/s12909-020-02312-0>
- [9] Aslam, R., Khan, N., Asad, M., & Ahmed, U. (2021). Impact of technological pedagogical content knowledge on teachers' digital proficiency at classroom in higher education institution of pakistan. *Interactive Technology and Smart Education*, 18(1), 119-130. <https://doi.org/10.1108/itse-11-2020-0222>
- [10] Bandura, A. (1977). *Social learning theory*. Englewood Cliffs, NJ: Prentice Hall.
- [11] Baluyos, G. et al (2023). Students' Preference in Online Learning Environment and Academic Resilience in Relation to Their Academic Performance in Mathematics. *EduLine: Journal of Education and Learning Innovation* ISSN: 2775-6173 (online) Vol. 3 No. 3 (2023) <https://doi.org/10.35877/454RI.eduline2038>
- [12] Bozkurt, A., and Sharma, R. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian J. Distance Educ.* 15:2020.
- [13] Brown, Lynn, "Digital Citizenship: a Journey to Internet Safety" (2023). Theses and Dissertations. 1657. <https://ir.library.illinoisstate.edu/etd/1657> DOI: <https://doi.org/10.30707/ETD2023.20230711063200807142.999994>
- [14] Butt, Sameera, Asif Mahmood, Saima Saleem, Shah Ali Murtaza, Sana Hassan, and Edina Molnár. 2023. "The Contribution of Learner Characteristics and Perceived Learning to Students' Satisfaction and Academic Performance during COVID-19" *Sustainability* 15, no. 2: 1348. <https://doi.org/10.3390/su15021348>
- [15] Castro, M. D., & Tumibay, G. (2019). A literature review: efficacy of online learning courses for higher education institution using meta-analysis. *Education and Information Technologies*, 1–19. <https://doi.org/10.1007/s10639-019-10027-z>
- [16] Census of Population (2015). "Region XI (Davao Region)". Total Population by Province, City, Municipality and Barangay. PSA. Retrieved 20 June 2016.
- [17] Chu, Isaac Yen-Hao, Alam, Prima, Larson, Heidi J, Lin, Leesa, Social consequences of mass quarantine during epidemics: a systematic review with implications for the COVID-19 response, *Journal of Travel Medicine*, Volume 27, Issue 7, October 2020, taaa192, <https://doi.org/10.1093/jtm/taaa192>
- [18] Coman, C.. et al. (2020). Online Teaching and Learning in Higher Education computer-mediated instruction: an empirical study in Vietnam. *Educ Inf*
- [19] Cutler, C. (2019). Overview of non-experimental research. In *Research methods in psychology*.
- [20] Dela Cruz, Francis Jose S. (2021); Challenges Of Physical Education Students In Online Learning Using Google Classroom During Covid-19 Pandemic *Int. J. of Adv. Res.* 9 (Nov). 193-198] (ISSN2320-5407). [www.journalijar.com](http://www.journalijar.com)
- [21] DiLoret M, Gray J (2016). The Effects of Student Engagement, Student Satisfaction, and Perceived Learning in computer-mediated instruction Environments, *NCPEA International Journal of Educational Leadership Preparation*, Vol. 11, 1-20
- [22] Elkhamisy F.A.A, Sharif AF (2021) Medical students perceptions of virtual learning stations as an innovativeteaching tool: a qualitative study. *Interactive Learning Environments* 0:0, pages 1-17.
- [23] Fabriz, Sabine & Mendzheritskaya, Julia & Stehle, Sebastian. (2021). Impact of Synchronous and Asynchronous Settings of Online Teaching and Learning in Higher Education on Students' Learning Experience During COVID-19. *Frontiers*

- in Psychology. 12. 733554. 10.3389/fpsyg.2021.733554.
- [24] Fatma Alzahraa Abdelsalam, Elkhamisy, Sharif, Asmaa Fady. Medical students perceptions of virtual learning stations as an innovative teaching tool: a qualitative study in Interactive Learning Environments ; : 1-17, 2021.
- [25] Fraile, M., Vélez, A., & Lacambra, A. (2018). Development of digital competence in secondary education teachers' training. *Education Sciences*, 8(3), 104. <https://doi.org/10.3390/educsci8030104>
- [26] Frambach, Janneke & Van der Vleuten, Cees & Durning, Steven. (2013). AM Last Page: Quality Criteria in Qualitative and Quantitative Research.. *Academic medicine : journal of the Association of American Medical Colleges*. 88. 552. 10.1097/ACM.0b013e31828abf7f.
- [27] Fransson, Göran & Norman, Fredrik. (2021). Exploring how a digitally skilled teacher's self-understanding influences his professional learning strategies. A
- [28] Garratt-Reed, D., Roberts, L. D., & Heritage, B. (2016). Grades, Student Satisfaction and Retention in Online and Face-to-Face Introductory Psychology Units: A Test of Equivalency Theory. *Frontiers in psychology*, 7, 673. <https://doi.org/10.3389/fpsyg.2016.00673>
- [29] Guillén-Gámez, F. D., Mayorga-Fernández, M. J., Bravo-Agapito, J., and Escribano-Ortiz, D. (2020). Analysis of teachers' pedagogical digital competence: identification of factors predicting their acquisition. *Technol. Knowl. Learn.* 26, 491–498. doi: 10.1007/s10758-019-09432-7
- [30] Harsasi, Meirani, (2018). Determinants Of Student Satisfaction In Online Tutorial: A Study Of A Distance Education Institution. *Turkish Online Journal of Distance Education-TOJDE*. ISSN 1302-6488 Volume: 19 Number: 1 Article 7
- [31] nstefjord, Elen & Munthe, Elaine. (2017). Educating digitally competent teachers: A study of integration of professional digital competence in teacher education. *Teaching and Teacher Education*. 67. 37-45.10.1016/j.tate.2017.05.016.
- [32] Jaggars, S. S., & Xu, Di (2016). How do online course design features influence student performance? *Computers and Education*, 95, 270-284, doi: 10.1016/j.compedu.2016.01.014
- [33] Johnson, Arvin D., "Principal Perceptions of the Effectiveness of University Educational Leadership Preparation and Professional Learning" (2016). Faculty Publications. 3743
- [34] Keržič D, Alex JK, Pamela Balbontín Alvarado R, Bezerra DdS, Cheraghi M, Dobrowolska B, et al. (2021) Academic student satisfaction and perceived performance in the e-learning environment during the COVID-19 pandemic: Evidence across ten countries. *PLoS ONE* 16(10): e0258807. <https://doi.org/10.1371/journal.pone.0258807>
- [35] Khan, M.A.; Vivek; Nabi, M.K.; Khojah, M.; Tahir, M. Students' Perception towards E-Learning during COVID-19 Pandemic in India: An Empirical Study. *Sustainability* 2021, 13, 57. <https://dx.doi.org/10.3390/su13010057>
- [36] Kim, Duyên & Mr, Kien & Ms, Nhu & Ms, Mai & Dinh, Tuong. (2021). Factors Affect Students' Satisfaction In Blended Learning Courses In A Private University In Vietnam. 28. 1-29.
- [37] Kolb A. Y., Kolb D. A. (2017). Experiential learning theory as a guide for experiential educators in higher education. *Exp. Learn. Teach. Higher Educ.* 1, 7–44.
- [38] Kong Y. (2021). The Role of Experiential Learning on Students' Motivation and Classroom Engagement. *Frontiers in psychology*, 12, 771272. <https://doi.org/10.3389/fpsyg.2021.771272>
- [39] Kumar, P., Saxena, C. & Baber, H. Learner-content interaction in e-learning– the moderating role of perceived harm of COVID-19 in assessing the satisfaction of learners. *Smart Learn. Environ.* 8, 5 (2021). <https://doi.org/10.1186/s40561-021-00149-8>
- [40] Kumalasari, Dewi & Akmal, Sari. (2021). Less Stress, More Satisfaction with Online Learning During the COVID-19 Pandemic: The Moderating Role of Academic Resilience. *Psychological Research on Urban Society*. 4. 10.7454/proust.v4i1.115.
- [41] Kurucay M. (2017) Examining the effects of learner-learner interactions on satisfaction and learning in an online undergraduate course. *Comput Educ.* 115:20– 37.
- [42] Lapada, A., Miguel, F., Robledo, D., & Alam, Z. (2020). Teachers' Covid-19 awareness, distance learning education experiences and perceptions towards institutional readiness and challenges. *International Journal of Learning, Teaching And*

- Educational Research, 19(6), 127–144. doi: 10.26803/ijlter.19.6.
- [43] Li M, Yu Z. Teachers' Satisfaction, Role, and Digital Literacy during the COVID-19 Pandemic. Sustainability. 2022; 14(3):1121. <https://doi.org/10.3390/su14031121>
- [44] Lin, J and Wang, Y (2024). Unpacking the mediating role of classroom interaction between student satisfaction and perceived online learning among Chinese EFL tertiary learners in the new normal of post-COVID-19, Acta Psychologica, Volume 245,104233, ISSN 0001-6918, <https://doi.org/10.1016/j.actpsy.2024.104233>.
- [45] Lockman, A. S., & Schirmer, B. R. (2020). Online instruction in higher education: Promising, research-based, and evidence-based practices. Journal of Education and e-Learning Research, 7(2), 130–152.
- [46] Lohr, S.L. (2021). Sampling: Design and Analysis (3rd ed.). Chapman and Hall/CRC. <https://doi.org/10.1201/9780429298899>
- ri, G. (2020) Factors affecting students' intentions to undertake
- [47] Martín, S. C., Marcos Cabezas González & Francisco José García Peñalvo (2020) Digital competence of early childhood education teachers: attitude, knowledge and use of ICT, European Journal of Teacher Education, 43:2, 210.
- [48] Mohammadi Zenouzagh, Z., Admiraal, W. & Saab, N. Learner autonomy, learner engagement and learner satisfaction in text-based and multimodal computer mediated writing environments. Educ Inf Technol 28, 14283–14323 (2023). <https://doi.org/10.1007/s10639-023-11615-w>
- [49] Mucherah, Winnie. (2018). The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation Cross-Cultural Research.
- [50] Mukhtar K, Javed K, Arooj M, Sethi A. Advantages, Limitations and Recommendations for computer-mediated instruction during COVID-19 pandemic era. 2020;36(COVID19-S4):COVID19-S27-S31. doi: <https://doi.org/10.12669/pjms.36.COVID19-S4.2785>
- [51] Napal Fraile, M., Peñalva-Vélez, A., & Mendióroz Lacambra, A. (2018). Development of Digital Competence in Secondary Education Teachers' Training. Education Sciences, 8(3), 104. <https://doi.org/10.3390/educsci8030104>
- [52] Northcote, Maria & Gosselin, Kevin & Kilgour, Peter & Reynaud, Daniel & McLoughlin, Catherine. (2019). A professional learning program for novice online teachers: Application of professional development guidelines using threshold concepts and computer-mediated instruction perceptions. computer-mediated instruction.23.10.24059/olj.v23i4.1573.
- [53] Nurcahyandi, Z., & Purwaningrum, J. (2022). Penerapan Teori Belajar David Kolb Dalam Pembelajaran Matematika Materi Koordinat Kartesius. Sigma: Jurnal Pendidikan Matematika. <https://doi.org/10.26618/sigma.v14i1.6888>.
- [54] Perveen, Ayesha (2016). Synchronous and Asynchronous E-Language Learning: A Case Study of Virtual University of Pakistan. Open Praxis, vol. 8 issue 1, pp. 21–39
- [55] Powers, K. L., Brooks, P. J., Galazyn, M., and Donnelly, S., 2016. Testing the efficacy of MyPsychlab to replace traditional instruction in a hybrid course. Psychology Learning and Teaching, 15(1), pp. 6–30.
- [56] Prabhu, M et al (2022). Digital Competence and the Gender Gap: A Case Study of Hospitality Students. Published in the USA International Journal of Media and Information Literacy Issued since 2005 E-ISSN 2500-106X 2022. 7(1): 190-196 DOI: 10.13187/ijmil.2022.1.190 <https://ijmil.cherkasgu.press>
- [57] Prichard J.R. , et al (2021). Predicting Levels of Student Satisfaction during COVID-19. <https://er.educase.edu/articles/2021/4/predicting-levels-of-student-satisfaction-during-covid-19>. Research cooperation between a teacher and a researcher. Teacher Development. 25. 1-17. 10.1080/13664530.2021.1891131.
- [58] Ribeiro, R. (2020, April). How university faculty embraced the remote learning shift. EdTech Magazine.
- [59] Salas-Pilco S. Z., Yang Y., Zhang Z. (2022). Student engagement in online learning in Latin American higher education during the COVID-19 pandemic: A systematic review. British Journal of Educational Technology, 53(3), 593–619.
- [60] Sharif Nia H, et al.(2023). Student satisfaction and academic efficacy during online learning with the mediating effect of student engagement: A multi-

- country study. PLoS One. 2023 Oct 4;18(10):e0285315. doi: 10.1371/journal.pone.0285315. PMID: 37792853; PMCID: PMC10550170.
- [61] Sebullen, M. (2023). Feeling The Flip: Investigating Senior High School Students' Satisfaction with Blended Learning. IRE Journals. Volume 6 Issue 12. ISSN: 2456-8880
- [62] Sillat, L.H.; Tammets, K.; Laanpere, M. Digital Competence Assessment Methods in Higher Education: A Systematic Literature Review. Educ. Sci. 2021, 11, 402. <https://doi.org/10.3390/educsci11080402>
- [63] Simões, S., Oliveira, T., & Nunes, C. (2022). Influence of computers in students' academic achievement. Heliyon, 8(3), e09004. <https://doi.org/10.1016/j.heliyon.2022.e09004>
- [64] Simonson, Michael. (1999). Equivalency theory and distance education. Tech trends. 43. 5-8. 10.1007/BF02818157.
- [65] Somayeh Ghaderizefreh, Michael L. Hoover (2018). Student Satisfaction with computer-mediated instruction in a Blended Course. International Journal of Digital Society (IJDS), Volume 9, Issue 3
- [66] Strachota, E. M. (2003). Student Satisfaction in Online Courses: An Analysis of the Impact of Learner-Content, Learner-Instructor, Learner-Learner, and Learner-Technology Interaction. [Dissertation thesis]. [Milwaukee (EE.UU.): University of Wisconsin–Milwaukee.
- [67] Suárez-Rodríguez, J., Almerich, G., Orellana, N., & Díaz-García, I. (2018). A basic model of integration of ICT by teachers: competence and use. Technol 26, 6629–6649
- [68] Sudarsana, Ketut(2019).Technology Application In Education And Learning Process.Journal of Physics: Conference Series 1363 (2019) 012061. doi:10.1088/1742-6596/1363/1/012061
- [69] Tadayon Nabavi, Razieh & Bijandi, Mohammad. (2012). Bandura's Social Learning Theory & Social Cognitive Learning Theory.
- [70] Tate, T., & Warschauer, M. (2022). Equity in online learning. Educational Psychologist, 57(3), 192–206. <https://doi.org/10.1080/00461520.2022.2062597>
- [71] Telli Yamamoto, G., & Altn, D. (2020). The coronavirus and rising of online education. Journal of University Research, 3(1), 25-34.
- [72] Tolentino, Karylle & Razll, Ma & Handang, Juspher & Biri, Alprince King & Saldariega, Lyka & Bengil, Irish Faye. (2023). Stressors and Coping Strategies of Teacher Education Students on Online Learning: A Quantitative Study. 2.
- [73] Tondeur, Jo & van Braak, Johan & Ertmer, Peggy & Ottenbreit-Leftwich, Anne. (2016). Understanding the relationship between teachers' pedagogical beliefs and technology use in education: A systematic review of qualitative evidence. Educational Technology Research and Development. 65. 10.1007/s11423-016-9481-2.
- [74] Torrado M and Blanca MJ (2022) Assessing Satisfaction With Online Courses: Spanish Version of the Learner Satisfaction Survey. Front. Psychol. 13:875929. doi: 10.3389/fpsyg.2022.875929
- [75] Wittink, D.R. & Bayer, L.R.. (2003). The Measurement Imperative. 6. 14-23.
- [76] Zheng Yi , Xiao Ao (2024). A structural equation model of online learning: investigating self-efficacy, informal digital learning, self-regulated learning, and course satisfaction. Frontiers in Psychology. Volume 14. <https://www.frontiersin.org/journals/psychology/articles/10.3389/fpsyg.2023.1276266>. DOI=10.3389/fpsyg.2023.1276266. ISSN=1664-1078