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Students' Preference in Online Learning Environment and Academic Resilience in Relation to Their Academic Performance in Mathematics

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Abstract

Students' online learning environment and academic resilience are indicators of academic success in online learning. This study determined the level of perception in an online learning environment and academic resilience concerning students' performance in Mathematics among Junior High School students at Misamis University, Ozamis City, during the first quarter of the school year 2021-2022. The researchers used the descriptive-correlational research design. The respondents were 148 Junior High School students chosen by simple random sampling. The instruments used were the Students' Online Learning Environment Questionnaire (SOLEQ) and the Students' Academic Resilience Questionnaire (SARQ). Mean, standard deviation, Pearson r, and Stepwise Regression Analysis were the statistical tools used. Findings revealed that students had a high level of perception in their online learning environment and had high academic resilience in their online learning. They performed very satisfactorily in their online class. There was a significant relationship between the students' online learning environment in terms of computer usage, teacher support, and student autonomy and their academic performance in Mathematics. In the students' online learning environment, there was no significant relationship between the other variables and their academic achievement in Mathematics. Furthermore, there was a significant relationship between the students' academic resilience and their academic performance in Mathematics. Computer Usage predicted students' academic performance in Mathematics. Teachers need to be technologically proficient in using technology as an educational tool. School administrators conduct online seminars, trainings, and workshops regarding technical literacy. Future researchers must look into other factors contributing to the student's academic performance in online learning.

Keywords: *academic performance in Mathematics, online learning, online learning environment, academic resilience, computer usage*

1. Introduction

The unexpected outbreak of Covid-19 was labeled a pandemic by the World Health Organization. This event challenged the global education system, forcing instructors to convert to online instruction. Previous research has shown that E-learning has many advantages for students because it is more flexible (Dhawan, 2020). Furthermore, by providing asynchronous and synchronous tools such as e-mail, forums, chats, and videoconferences, it can improve its interactions with students (Marinoni, Van't Land, & Jensen, 2020; Anwar & Adnan, 2020). Thus, online learning has become a crucial mode of instruction because of its capacity to improve education quality while using little resources and infrastructure (Aldholay, 2020).

However, this educational shift hampers students' educational pursuits. Millions of students worldwide are affected; some have already given up their student status (Asio, 2021). Two of the most difficult challenges in addressing the issue of online learning are students' learning environment and academic resilience in Mathematics. An online learning environment is the kind of environment usually enclosed within a learning management system (LMS) framework, which includes not only information deposit areas for the learners' engagement but also additional instructional tools like assignment submission and evaluation areas, grade interface, discussion boards, chat sessions, small group areas, in-course private mail, and many online learning environments offer additional plug-in social learning resources such as video conferencing (Manuel, 2021).

Mathematics professors encounter various obstacles in an online learning environment, mainly because mathematics is an abstract science that is challenging to convey with few words and translations (Amelia, 2020). There are several things to think about in an online learning environment that affect students' learning processes, such as low motivation and delayed feedback or assistance since professors are not always present when students want assistance while

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learning, or feelings of loneliness owing to the absence of peers' physical presence (Coman, 2020). A hostile learning environment can affect students, including low student achievement, poor behavior, anxiety, or despair. On the other hand, a positive learning environment encourages students to feel at ease and secure in their abilities as learners. As a result, students are dedicated workers with excellent success levels. Thus, an online learning environment is critical to student performance and has a wide range of effects on individuals (Williams, 2018).

The COVID-19 pandemic also had the most significant influence on the quality of the learning experience and the emotional health of students. Academic resilience is regarded as psychological capital because it assists students in overcoming stress and increasing satisfaction (Kumalasari & Akmal, 2022). Academic resilience is the capacity of a student to deal well with academic failures, anxiety, and study pressure. In today's world, students face several challenges in both school and society. Resilient persons can deal with, overcome, or recover from significant academic challenges (Radhamani &Kalaivani, 2019).

It came to light that while resilience helps children be more tolerant and understand what is happening around them, it is precisely in these obstacles that the qualities of high academic performance are displayed. Successful students display abilities in formal thinking, creative thinking, mathematical application, and resilience, all of which influence their overall quality of life (Rojas & Gallardo, 2020). When faced with problems in studying mathematics, students with solid resilience will not give up quickly (Iman & Firmansyah, 2019). Consequently, the COVID-19 epidemic requires remarkable mathematical resilience among online learning students.

When looking at students' online learning academic performance in Mathematics, there are more factors to consider. Ferri, Grifoni, and Guzzo's (2020) study revealed several technological, pedagogical, and social challenges. The technological difficulties are primarily due to the unpredictability of internet connections and the unavailability of requisite electronic equipment among many pupils. The primary pedagogical obstacles are a lack of digital skills among instructors and learners, a lack of organized material vs. a plethora of online resources, a lack of engagement and motivation among learners, and a lack of social and cognitive presence among teachers (Fernando et al., 2020). Loss of human connection between teachers and students, as well as the absence of physical areas at home to receive lessons and a lack of support from parents who usually operate remotely in the same environments, resulted in social issues (Ferri et al., 2020; Makafane, & Chere-Masopha, 2021).

Students' learning environment and academic resilience are indicators of academic success concerning the students' performance in online learning. In Pakistan, students preferred something other than online learning over face-to-face instruction during this pandemic (Abbasi et al., 2020). A study by Hashemi (2021) revealed that COVID-19 has had a detrimental impact on Afghan students' academic achievement, and pupils were highly unsatisfied with online instruction during this vital period. According to the study of NyamburaMwangi (2018), academic resilience and accomplishment among secondary school students at sub-county secondary schools in Kiambu County, Kenya, were at a modest level. Students should strengthen academic resilience, which may improve their academic performance.

In the Philippines, before and after the implementation, students' anxiety remained “High,” suggesting they were afraid of and unsure of the new standard for Mathematics instruction. Additionally, findings showed that poor and unpredictable access to the internet, a lack of enthusiasm for self-study, numerous tasks at home, and domestic tasks were some of the primary causes of students' having trouble understanding the subject matter and adapting to the “New Normal” (Bringula, 2021).

Despite numerous studies on the significant impact of online learning attitude and online learning environment on students' academic performance, more information still needs to be available on the problems and specific strategies students use to overcome them (Barrot et al., 2021). Thus, considering the issues mentioned above, the researchers would like to determine the relationship between the student's level of perception in an online learning environment and academic resilience concerning their performance in Mathematics. The study's findings will be adopted to strengthen the existing online class, which may encourage an online learning environment and resilience in an online class to meet the academic goals of the learners and facilitate learning by becoming more engaged in Misamis University's virtual class.

2. Methodology

2.1. Research Design

This study employed a descriptive-correlational design. The research method was used to clarify phenomena, views, actions, and other identified variables by collecting and statistically analyzing numerical data (Kapici & Akçay, 2016).

The descriptive-correlational design would be appropriate for this study, which would determine the online learning environment and academic resilience concerning their performance in Mathematics.

2.2. Research Setting

The research was conducted at Misamis University in Ozamiz City. Misamis University is a privately owned, non-sectarian, non-profit educational institution founded by Dr. Hilarion Feliciano and Doña Maria Mercado Feliciano in 1929. It has 12 colleges offering 29 programs, including graduate programs, and has complete Basic Education programs. This study focused on the Junior High School Department at Misamis University. The Basic Education Junior High School Department is a four-story building. It has eight sections, with one section for grade seven, two for grade 8, two for grade nine, and three for grade 10. This study focused on the Junior High School Department at Misamis University. Also, Misamis University is using an online learning modality with Microsoft Teams as the Learning Management System (LMS) to cater to the needs of the students in virtual learning. Microsoft Teams, also known as Teams, is a proprietary communication tool for businesses created by Microsoft that is a part of the Microsoft 365 product family. It is where teachers and students conduct their classes in an asynchronous or synchronous schedule.

2.3. Respondents of the Study

The study's respondents were 148 Junior High School students at Misamis University. They have been selected through a purposive sampling technique. Respondents were determined through the following criteria: 1) students enrolled in Misamis University's Junior High School Department for the academic year 2021-2022; 2) students who completed their requirements in the first quarter; and 3) students who have given their full consent to participate in the study. Before conducting the survey, the researcher ensured that all criteria were met.

2.4. Instruments

The study used the following instruments:

a. *Students' Online Learning Environment (SOLE)*. This questionnaire was adapted from Northcote et al. (2016). This questionnaire is a five-point Likert scale, which was used to determine the students' online learning environment. The instrument includes eight constructs: computer usage, teacher support, student interaction and collaboration, personal relevance, authentic learning, student autonomy, equity, and asynchronicity. Hence, the instrument would be valid and reliable for the study.

In determining the student's level of perception in an online learning environment, the following scale was used:

Responses	Continuum	Interpretation
5- Always	4.20-5.0	Very High
4- Often	3.40-4.19	High
3- Sometimes	2.60-3.39	Moderately High
2-Rarely	1.80-2.59	Low
1-Never	1.0-1.79	Very Low

b. *Students' Academic Resilience (SAR)*. It is a 30-item questionnaire with three constructs, adopted and modified by Cassidy (2016), designed to determine the student's academic resilience. A five-point scale from 5 (always) to 1 (never) was utilized to solicit responses. Experts validated it and pilot-tested on junior high school students who would be excluded from the study. Moreover, it had to have a Cronbach's Alpha coefficient of 0.70 or higher.

The following continuum was used to assess students' academic resilience:

Responses	Continuum	Interpretation
5- Always	4.20-5.0	Very High
4- Often	3.40-4.19	High
3- Sometimes	2.60-3.39	Average
2- Rarely	1.80-2.59	Low
1-Never	1.0- 1.79	Very Low

c. *Students' Academic Performance in Mathematics.* The researcher used documentary analysis using the second quarter grades of the students from their teachers. In determining the academic performance in Mathematics of the students, the following scale was used based on the DepEd grading system:

Rating	Interpretation
90-100	Outstanding (O)
85-89	Very Satisfactory (VS)
80-84	Satisfactory (S)
75-79	Fairly Satisfactory (FS)
74 and below	Did Not Meet Expectation (DME)

2.5. Data Collection

In gathering the data, the researcher asked permission from the College of Education at Misamis University to conduct the study. Moreover, after the approval, the researcher asked permission from the Office of the Principal of Basic Education. After the permits were obtained, the researchers prepared a consent letter for the respondents. The researchers explained the importance of the study to the respondents. The data gathering was conducted on the school premises only. The researchers conducted and administered the survey questionnaires among the study's respondents to ensure complete cooperation with them and easier access for data retrieval. The information obtained was totaled, evaluated, and interpreted.

2.6. Ethical Consideraions

Prior to the conduct of the study, approval from the Department of the College of Education and Junior High School was sought. The researcher requested the respondents' voluntary participation to maintain the study's ethical component. The responders were assured that they would not be harmed in any manner. The respondents' privacy was protected, as was the confidentiality of the research data and the identities of individuals who participated in the study. Furthermore, misrepresentation and fabrication regarding the research's goals and objectives were avoided; all relationships, funding sources, and any conflicts of interest were indicated. Finally, all research-related communications were conducted openly and truthfully, without misleading information or misinterpreting main data findings.

Amdur & Bankert (2011) emphasized the importance of ethical behavior concerning the conduct of research, whether in respecting respondents, maximizing possible benefits and minimizing possible harm, or giving every student an equal chance to participate. Efficient and relevant research requires ethical researchers. As a result, success in research requires the researcher to be aware of ethical concerns.

2.7. Data Analysis

The study used the following tools in analyzing the data gathered with the use of Minitab Software:

Mean and standard deviation. These were used in determining the students' online learning environment, academic resilience, and academic performance in Mathematics.

Pearson r Product Moment Correlation Coefficient. It explored the significant relationship between the student's online learning environment, academic resilience, and academic performance in Mathematics.

Stepwise Regression Analysis. It was utilized to identify the predictors in the independent variables of the student's academic performance in Mathematics.

3. Results and Discussion

3.1. Students' Level of Perception in Online Learning Environment

Data in Table 1 revealed that, in general, the student's level of perception in the online learning environment was high (M = 3.89; SD = 0.77). They highly preferred the online learning environment in all areas, as evident in students' highest rating on teacher support (M = 4.12; SD = 0.71) and even the lowest rating on students' interaction and collaboration (M = 3.47; SD = 0.86). Two areas, teacher support (M = 4.12; SD = 0.71) and student autonomy (M = 4.02; SD = 0.75)

received the first two highest ratings. However, student interaction and collaboration (M = 3.47; SD = 0.86) and personal relevance (M = 3.81; SD = 0.78) were rated lowest by the students.

This means that students had a high perception of submitting their assignments online when their teachers provided them with helpful feedback on their work online and in group work involvement as part of their activities. Students also wanted to relate what they had learned or use facts in-class activities. It can also be noted that they prefer to control their learning and be treated the same as other students. Furthermore, students chose to access the discussion forum at places or times convenient.

The learning environment is critical to student performance and has a wide range of effects on individuals. A positive learning environment encourages students to feel at ease and secure in their learning abilities (Study.com, 2018). Results from this study contrast with the survey by Alawamleh et al. (2020), who stated that students continue to prefer classroom classes over online classes due to the numerous issues they encounter when taking online classes, such as a lack of motivation, a lack of understanding of the material, a decrease in communication levels between students and instructors, and a sense of isolation caused by online classes. However, the study of Muthuprasa et al. (2021) supported this study, revealing that most students had a positive attitude regarding online classrooms in the aftermath of Corona. Students preferred to learn online using their smartphones. Through content analysis, their study also discovered that students prefer recorded lessons with a quiz at the closing of each class to maximize learning effectiveness. Thus, online learning was determined to be helpful since it offered learners flexibility and convenience.

The learning environment is an essential aspect that influences learning and serves as a measure of educational quality. Because the outcomes of this study demonstrated that students' preferences for Mathematics in online learning environments still need to be optimal, teachers must devise relevant interventions. Teachers may encourage socialization and collaboration. Teachers may create group projects and encourage online students to participate and communicate using Google Hangouts or Zoom. Teachers can also make smaller group sessions with students to work with them, allowing them to speak more openly and interact in a more comfortable environment. Teachers may also build suitable ways to help them work with all their students; meeting with students online is vital.

Table 1. Students' Level of Perception in Online Learning Environment (n = 148)

Constructs	M	SD	Remarks
Computer Usage	3.83	0.75	High
Teacher Support	4.12	0.71	High
Student Interaction & Collaboration	3.47	0.86	High
Personal Relevance	3.81	0.78	High
Authentic Learning	3.99	0.74	High
Student Autonomy	4.02	0.75	High
Equity	3.96	0.80	High
Asynchronicity	3.90	0.73	High
Overall Perception	3.89	0.77	High

Note: Online Learning Environment Scale 4.20-5.0 (Very High); 3.40-4.19 (High); 2.60-3.39 (Moderate); 1.80-2.59 (Less); 1.0-1.79 (Least)

3.2. Students' Academic Resilience

The students' academic resilience, in general, was high (M = 3.61; SD = 0.72). In addition, students have a high level of intellectual strength in terms of perseverance, which received the lowest rating (M = 3.60; SD = 0.52) and the highest rating reflecting adaptive help-seeking (m = 4.03; SD = 0.71).

The data implies that students have high academic resilience in learning Mathematics. They always worked harder, kept trying, and used the tutor's feedback to improve their work. They never gave up but instead tried to think of new solutions and used the situation to motivate themselves. Students also tried to think more about their strengths and weaknesses to help themselves work better and sought encouragement from their family, friends, and tutors.

Academic resilience is exceptionally essential in modern education. Intellectual resilience enables a person to face life's challenges in any domain. It is regarded as a problem-solving ability. Academic resilience allows students to deal with adverse circumstances efficiently and handle and manage stress and strain in the classroom. Academic resilience includes a variety of characteristics, such as students learning to deal with disappointment, failures, and changes, as

well as the capacity to self-motivate (Monika, 2022). Students with high academic resilience were 1.73 times more likely to maintain and improve their academic performance (Dwiastuti et al., 2022).

Teachers should, therefore, embrace efforts to promote academic resilience. For this reason, shaping students to be more resilient has many positive underlying contributions to students' performance. Consequently, teachers may design a safe and supportive learning environment that fosters students' perseverance, reflection, and adaptive help-seeking. Thus, identifying the vital aspects of academic resilience will allow for a more refined and focused approach to interventions to assist students in coping with the rigors of academic life.

Table 2. Academic Resilience (n = 148)

Constructs	M	SD	Remarks
Perseverance	3.60	0.52	High
Reflecting and Adaptive Help-Seeking	4.03	0.71	High
Overall Resilience	3.61	0.72	High

Note: Academic Resilience Scale 4.20-5.0 (Very Highly); 3.40-4.19 (High); 2.60-3.39 (Moderately High); 1.80-2.59 (Low); 1.0-1.79 (Very Low)

3.3. Students' Academic Performance in Mathematics

Data in Table 3 revealed that students' academic performance in Mathematics, in general, was very satisfactory (M=85.19). Students' academic performance in Mathematics was measured through written and performance tasks. Written tasks are equivalent to 50 percent, including quizzes, assignments, and reflections. Furthermore, performance tasks are analogous to percent, which includes attendance and participation. The findings show that the students performed very satisfactorily in their online learning.

This means that teachers have helped the students succeed in their online programs. Using a variety of perspectives in class discussions helped students retain and apply the knowledge they have received and created regular assessments to encourage students to acquire knowledge that would aid them in their future careers. However, the students can still improve their problem-solving skills in Mathematics for them to be able to achieve the optimum level.

Performance improvements of students in Mathematics in an online learning environment, as observed in the study of Spitzer & Musslick (2021), could be caused by several factors. First, students' performance may have improved within the software due to increased usage of similar educational online platforms during the pandemic. Second, performance improvements may be driven by higher incentives provided by the teachers during the pandemic relative to the year before. Third, students who used online learning software at home received more tutoring from their parents or caregivers, clouding the authenticity of returned homework assignments.

Table 3. Academic Performance (n=148)

Students' Academic Performance in Mathematics	Frequency	Percent
Outstanding (O)	51	34.46
Very Satisfactory (VS)	35	23.65
Satisfactory (S)	27	18.24
Fairly Satisfactory (FS)	17	11.49
Did not Meet Expectation (DME)	18	12.16
Overall Performance	M= 85.19	Very Satisfactory

Performance Scale: 90-100 (Outstanding); 85-89 (Very Satisfactory); 80-84 (Satisfactory); 75-79 (Fairly Satisfactory); 74 and below (Did not Meet Expectation

This new standard of education, in which instructors and students are always working and adjusting to the rapid change from the old education system, should not be used to judge students' academic performance. Students must pay greater attention in class, participate in online activities, meet assignment deadlines, practice netiquette, and study the courses to attain the highest academic success in Mathematics. Teachers must create creative teaching techniques on a case-by-case basis as teaching and learning grow increasingly individualized. Teachers may provide cognitive problem-solving exercises that encourage students to analyze, apply, judge, and derive new interpretations and information in

Mathematics. Furthermore, teachers should periodically upskill themselves to new techniques of teaching influenced by technology improvements to suit students' demands and improve their academic achievement in Mathematics.

3.4. Significant Relationship between the Students' Level of Perception in Online Learning Environment and Academic Performance in Mathematics

Pearson Product Moment Correlation Coefficient was used to determine the significant relationship between the students' preference in the online learning environment and their academic performance in Mathematics (Table 4). Data revealed that among the eight constructs, three were related to students' academic performance in Mathematics, namely computer usage (r=0.24; p=0.00), teacher support (r=0.23; p=0.01), and student autonomy (r=0.17; p=0.04). The five other constructs were not related to students' academic performance in Mathematics, namely: student interaction and collaboration (r=0.11; p=0.17), personal relevance (r=0.12; p=0.15), authentic learning (r=0.10; p=0.24); equity (r=0.15; p=0.15); and asynchronicity (r=0.16; p=0.16).

This means that areas under student's online learning environment, such as computer usage, teacher support, and student autonomy, affect students academic performance in mathematics. This means that students who use computers are more likely to perform better in Mathematics. Those students with better performance also have teachers with higher levels of support for their students. Students who prefer to work at their own pace also achieved a high level of performance in Mathematics. However, the higher level of student interaction, personal relevance, authentic learning, equity, and asynchronicity does not mean that students' academic performance in Mathematics improves.

Table 4. Significant Relationship between the Level of Perception in Online Learning Environment and Academic Performance in Mathematics

Variables	*r* value	Relationship Strength	*p* value	Remark
Computer Usage and Academic Performance	0.24	Weak	0.00	Highly Significant
Teacher Support and Academic Performance	0.23	Weak	0.01	Highly Significant
Student Interaction and Collaboration and Academic Performance	0.11	Very Weak	0.17	Not Significant
Personal Relevance and Academic Performance	0.12	Very Weak	0.15	Not Significant
Authentic Learning and Academic Performance	0.10	Very Weak	0.24	Not Significant
Student Autonomy and Academic Performance	0.17	Very Weak	0.04	Significant
Equity and Academic Performance	0.15	Very Weak	0.15	Not Significant
Asynchronicity and Academic Performance	0.16	Very Weak	0.16	Not Significant

Note: Relationship Strength Scale: 1.00 (Perfect); 0.80-0.99 (Very Strong); 0.60-0.79 (Strong); 0.40-0.59 (Average); 0.20-0.39 (Weak); 0.01-0.19 (Very Weak); 0.00 (No Relationship)

Probability Value Scale: **p<0.01 (Highly Significant); *p<0.05 (Significant); p>0.05 (Not significant)

Learner academic achievement can be improved with autonomy-supportive teaching in higher education. An educational environment demands learners to be self-driven and self-determined, which is more appropriate for students (Seli & Dembo, 2019). Links between teacher support, student autonomy, and academic performance and commitment hold for high school students, providing further support for an indirect connection between student experience of support and academic performance through student autonomy (Adena & Connell, 2018).

Students, especially in the new typical education, must complete things online. Students must be able to manage their time well and work at their own pace. Students must be technologically proficient and able to integrate technology into

their learning. Teachers may assist students in their education. They must be engaging and available for students to feel comfortable asking questions or seeking clarifications online. Teachers must encourage students to participate online and provide constructive comments.

3.5. Significant Relationship between the Students' Academic Resilience and Academic Performance in Mathematics

Data revealed that all areas in students' academic resilience were related to student's academic performance in Mathematics: perseverance (r=0.16; p=0.05) and reflecting and adaptive help-seeking (r=0.21; p=0.01).

This means that areas under students' academic resilience, such as perseverance, reflecting, and adaptive help-seeking, affect students' academic performance in Mathematics. Students who overcome difficult situations are more likely to perform well in Mathematics. Those students who seek encouragement from their family, friends, and most importantly, from themselves and who know how to reflect on themselves also achieve better performance in Mathematics. In other words, if the student has perseverance and knows how to reflect on their strengths and weaknesses in their online learning, they can achieve a better academic performance in Mathematics.

Students must develop resilience as a noncognitive quality to assist them in enduring academic stress, adversity, threats, and setbacks and increase their overall well-being (Kang et al., 2019). There is a link between resilience and academic and personal well-being among university students (Stoffel & Cain, 2018). Academically resilient students are more likely to attain higher levels of success despite the risks and problems they face. Academic resilience is characterized as a student's ability to improve academic performance following an adverse occurrence, such as failing an individual assessment or a course (Cassidy, 2016).

The teachers must ensure that students maintain hard work and persistence, sticking to plans and goals, embrace and using feedback, innovative problem solving, and treating adversity as an opportunity to confront challenges and progress. Teachers must also make activities that let students reflect on their strengths and weaknesses and seek help, support, and encouragement. They may assure online learners that online consultations are available when needed. Timely feedback on the works of online learners is highly encouraged to sustain their positive outlook about their capabilities. Individualized feedback can be provided to inform online learners that they are performing well (or not performing well) relative to their classmates.

Table 5. Relationship between the Students' Academic Resilience and their Academic Performance in Mathematics

Variables	*r* value	Relationship Strength	*p* value	Remarks
Perseverance and Academic Performance	0.16	Very Weak	0.05	Significant
Reflecting and Adaptive Help-Seeking and Academic Performance	0.21	Weak	0.01	Highly Significant

Note: Relationship Strength Scale: 1.00 (Perfect); 0.80-0.99 (Very Strong); 0.60-0.79 (Strong); 0.40-0.59 (Average); 0.20-0.39 (Weak); 0.01-0.19 (Very Weak); 0.00 (No Relationship)

Probability Value Scale: **p<0.01 (Highly Significant); *p<0.05 (Significant); p>0.05 (Not significant)

3.6. Predictor of Students' Academic Performance in Mathematics

Regression analysis was used to explore the predictor of students' academic performance in Mathematics, resulting in p-values lesser than 0.01 alpha level. Data revealed that among the five factors in the students' online learning environment, only one aspect- computer usage (β= 2.83, t= 3.00, p= 0.00) affects students' academic Performance in Mathematics. Other factors in academic resilience, like perseverance reflecting and adaptive help-seeking, do not affect the student's academic performance in Mathematics. These factors are not predictors of students' academic performance in Mathematics.

The regression equation (Academic Performance=74.36 + 2.83 Computer Usage) indicates that for every unit increase in computer usage, the student's academic performance also increases by 2.83. The data with(r2=5.82%) shows that only 5.80 percent of student's academic performance in Mathematics is attributed to students' online learning

environment in computer usage. The remaining 94.20 percent is attributed to other factors not included in the study. Thus, future researchers should look into these factors that predict the student's academic performance in Mathematics.

Although computer-based technology has pervaded many aspects of life and industry, little is known about how it might be utilized to encourage students' learning. This concept is growing in higher education due to its link to several favorable academic results (Schindler et al., 2017). In conclusion, CT treatments have proven beneficial in helping students learn mathematics. The expectation that CT can improve schooling mathematics outcomes has grown as these interventions have become more effective and accessible. Many researchers now regard CT as a possible solution to mathematics students' problems (Ran et al., 2021).

Furthermore, computer use for online learning influences student academic achievement in Mathematics. If students use online media effectively and avoid wasting time on unproductive activities, their academic performance will improve. This suggests that students' high academic achievement is a significant indicator of high-quality instruction. Teachers can create computer-based exercises for their students. For example, a teacher may allow students to use statistical software such as Minitab or SPSS. Teachers' instruction must be computer-aided to be suitable for students in online learning. To support classroom instruction, teachers may receive training in computer-assisted education.

Table 6. Predictor of Students' Academic Performance

Predictor	Coef	SE Coef	T-Value	P-Value
Constant	74.36	3.67	20.25	0.00
Computer Usage	2.83	0.94	3.00	0.00
Adjusted $\mathbf{r^2 = 5.82\%}$				
F-value = 9.02				
P-value = 0.003				
Dependent Variable: Computer Usage				
Academic Performance=74.36 + 2.83 Computer Usage				

4. Conclusions and Recommendations

The students had a high level of perception regarding computer usage, teacher support, student interaction and collaboration, personal relevance, authentic learning, student autonomy, equity, and asynchronicity in online education which students favor and embrace online learning modality. Additionally, the students had high academic resilience indicating that they are adaptive and flexible in online learning. Students performed very satisfactorily in their online classes. There was a significant relationship between the students' online learning environment in terms of computer usage, teacher support, and student autonomy and their academic performance in Mathematics. Moreover, students' potential ability to be able to survive and improve achievement despite facing stressful events helps students' academic success. Computer usage is a factor that contributes to the student's academic performance in online learning, which means that students must be more engaged in technology.

Based on the findings and conclusion of the study, the following are the recommendations: Teachers must create a conducive online learning environment that promotes student autonomy and collaboration. Moreover, teachers may design activities in Mathematics that encourage students' online communication and participation. Teachers can promote positive emotions and encourage goal setting. In addition, teachers may design a safe and supportive learning environment that will foster students' perseverance, reflection, and adaptive help-seeking. Teachers may frequently enhance their skills with new teaching methods inspired by technological advancements to meet the needs of students and raise their academic achievement in mathematics. Teachers motivate students to interact online and leave helpful feedback. For students to feel more comfortable asking questions or looking for answers online, teachers must be engaging and accessible enough. Teachers must be technologically proficient in using technology as an educational tool. School administrators schedule online seminars, trainings, and workshops regarding technical literacy for teachers to be knowledgeable and literate in using technology as a medium for education. Future researchers must conduct another research study that explores the factors that affect students' academic achievement in mathematics.

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