

Assertive Classroom Management Strategies and Student Interest in Mathematics: A Prediction Model on Student Attitude Towards Online Learning

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Abstract— This study was conducted to determine the influence of assertive classroom management strategies and student interest in mathematics on students' attitudes toward online learning. The data from three hundred (300) students were analyzed using the descriptive-predictive design utilizing the mean, standard deviation, Pearson r, and multiple regression linear analysis. The design used in the study is quantitative and causal. The primary tool used in data collection is a standardized, contextualized survey instrument. Findings revealed that assertive classroom management strategies significantly correlated with students' attitudes towards online learning ($r=0.390$, $p<0.05$). Similarly, student interest in mathematics significantly correlated to student attitude towards online learning ($r=0.353$, $p>0.05$). Since the significant influence of assertive classroom management and student interest in mathematics to predict student attitude toward online learning, overall results show indicators of teaching-management strategies, teacher-student relationship strategies, teacher punishment, and reward strategies. Additionally, meaningfulness, group work, puzzles, and computers indicate a predictive relationship to student attitudes toward online learning. The teacher organizing strategies, personal interest, situational interest, and involvement do not have statistically significant relationships to student attitude towards online learning in the model, this signifies that the result that the other indicators could have substantial predictive value than the given indicators.

Keywords— education, assertive classroom management, student interest in math, attitude towards online learning, regression, Philippines.

I. INTRODUCTION

Globally, educational institutions ceased operations in an attempt to control the viral outbreak of the Covid-19 pandemic. Closing schools has an unparalleled impact on students', parents', and teachers' everyday lives (Garbe et.al.,2020). Distance education provides an alternative option in delivering lessons to the learners. As a result, teachers and learners have been using online learning and teaching on a massive scale. Several factors, including their technological proficiency and experience, may significantly impact students' attitudes and perceptions regarding distance learning and online learning. Technological hurdles resulting from a lack of abilities might demotivate students from online learning and induce anxiety (Lyubka et. al, 2018).

External and internal influences can both have an impact on a student's achievement. Multiple factors can contribute to an individual's achievement of learning goals, including internal and external factors (Wiradarma et al., 2021). Physical and psychological factors, including the student's interests, are factors of the individual self (Ramón-Arbués et al., 2020). Interest is a learner's readiness or mastery of prior knowledge in

a subject that can help them handle a topic's next or higher level of learning or an associated education activity. Ligan, et al. (2023) cite a link between mathematics interest and both student and teacher characteristics, as well as mathematics anxiety. Luzano (2023) asserts that students' lack of interest in mathematics can also contribute to low achievement.

When regular face-to-face instruction is not possible, the students' attitudes toward online learning are crucial to optimizing the benefits of online education. It is built on technology to improve classroom engagement via a positive atmosphere, in which learners are consciously involved in online tutorials to complete a work set for them (Ahmed and Al-Kadi, 2021). Technology-enabled learning is advantageous and more engaging since it makes things that students typically find boring more dynamic and enjoyable. With simple access to both classes and learning materials at home, students were able to attend them from anywhere in the world with outstanding ease. By integrating learning platforms with cutting-edge interactive applications, online classrooms have become more convenient for professors and students. This is because more students can use

particular online applications to express their opinions simultaneously (Prakash, 2021).

Academic success depends on interest, a potent motivating factor that drives learning and directs career and educational paths. Engaging students in the teaching and learning of mathematics not only increases their confidence but also enhances their mathematical ability. Students will become more confident in their ability to study mathematics and perform better in the subject the more involved in its teaching and learning (Salifu & Bakari, 2022). Higher education institutions increasingly use e-learning as a teaching method cited by (Onyema et. al., 2020). E-learning technologies and Learning Management Systems are used in today's classrooms, whether traditional or online, to attract students' attention and include them in the learning process (Bradly, 2021).

Furthermore, students expressed their liking or dislike for mathematics based on the presentation of the material (Aguilar, 2021). When students perceive the teacher's material as engaging, enjoyable, significant, and pertinent, they become more motivated to study and are more prepared to comprehend it. Teachers must spend more time responding to student's questions and giving feedback since e-learning demands instantaneous. Providing timely responses to targeted inquiries would increase students' interest and involvement in e-learning platforms. To accommodate different learning styles and make their information appealing to students, teachers need to be innovative in their approach.

Students may study mathematics because they find it exciting and enjoyable. They also contend that fun and interest impact learning depth and length as well as the level of involvement Mazana (2019) cites this as evidence that students who enjoy mathematics are more likely to solve problems and improve their learning and performance. It is worthwhile to assess students' level of satisfaction with mathematics to monitor their learning and performance, as enjoyment, knowledge, and performance are all connected.

Assertive classroom management explains the procedures utilized to maintain a classroom that is orderly and conducive to full student participation. Though cooperation between the teacher and students yields more significant results, discipline is undoubtedly essential for effective classroom management. Teachers of all stripes frequently strive to maintain a peaceful

classroom environment. They must oversee the class and discipline the students in a way that inspires, motivates, and maintains positive behavior (Nisar et al., 2019). Canter's Assertive Discipline theory of Lee and Marlene Canter, cited by (Drew, 2021) means that the teacher-centered classroom management method supports teachers' and students' rights to a professional, peaceful, and safe workplace. This theory suggests that the teachers' attitude influences their behavior, which influences learners' behavior.

A method of classroom management that relies on adherence is called assertive discipline. The teacher exerts significant influence over the class. Students are mysteriously and instantly guaranteed to learn the lesson of self-discipline when a classroom is managed correctly cited by (Nisar et al., 2019). Morshedian (2023) cites teachers as "assertive teachers" who utilize a variety of classroom management techniques, including planning, managing instructions, fostering a positive rapport between instructors and students, and using rewards and punishment (consequences).

Two indications of students' interest in mathematics: personal interest (PI), defined as an interest a person has in a particular setting or "context." Some students, for instance, typically arrive at a math session already engaged (or uninterested) in the subject.

Conversely, situational interest, or SI, is an interest people develop through engagement with a setting or "context." As a result, the SI method stresses the significance of providing a suitable environmental context, whereas the PI approach stresses working with individual variations. The situational interest with different facets such as computers, group work, puzzles, and others are meaningfulness and involvement.

Electronic platforms have several advantages over traditional teaching, exploring learning and assessment effects on students and having observed essential changes in improving students' technological skills during the pandemic period (Elzainy et al., 2020). Students' opinions of online instruction and teacher-student interactions are favorable, according to Jurakovic et al. (2022).

The study's conclusions demonstrated a progressive influence on students' learning in terms of their approach to problem-solving and the growth of their critical thinking skills. Additionally, influencing the students' views are the teaching excellence and ease of use of online courses, the usability of online learning, and the

student's proficiency with computers. Their experiences with computers, which include apparent self-use, satisfaction, efficacy, and application of online learning, are essentially cited by (Abelgas, 2022).

Teachers should use these kinds of activities to create a safe and open learning atmosphere for their students. A successful teacher can transform the behavior of their students positively. Classroom management also means keeping students organized in the class for a better learning process.

Numerous studies revealed that students' traits, previously considered significant variables in distance learning in poor nations, significantly influenced the acceptance of online learning. These traits include laptop and web experience, internet self-efficacy, computer usability anxiety, and online learning strategies.

The Interest-Driven Creator theory (IDC) suggests that students can be nurtured as creators after engaging in interest-driven learning activities regularly with technology support (Chan et al., 2019). This idea emphasizes how a student's understanding of the material they are studying might affect their behavior or attitude's cognitive component.

The degree to which students find mathematics enjoyable to practice and learn is their enjoyment of mathematics. "Perceived usefulness" describes how students see the value of mathematics in their daily lives today and in the future.

Researchers believe that the perceived usefulness of mathematics influences students' attitudes toward online learning and the topic (Mazana, 2019)

Using a variety of techniques to create and maintain a better learning environment where students can achieve good learning outcomes is known as classroom management.

Educators employ a variety of instructional techniques to maintain order in the classroom, but what truly matters is ensuring students feel supported and comfortable, enabling them to exert their utmost effort (Monteiro, et al., 2021).

Over the past 30 years, research has demonstrated that a critical factor influencing student learning is the condition of the classroom environment in schools.

When students feel encouraged and supported in the classroom, they learn more effectively cited by (Ahmed et al., 2020).

Furthermore, although most students have positive attitudes toward online learning, they still favored in-person lectures delivered by teachers with the use of technology, with a prominent "face-to-face" and a secondary "technological" educational approach construct cited by (Basar, 2021)

The conclusions of this study encourage educators to not only emphasize and highlight additional beneficial elements but also to develop innovative ideas and implement them in the classroom.

The presence of sporadic internet access. Students who learn mathematics online have differing opinions about their mathematical aptitude and level of interest in the subject (Bringula et al., 2021). Teachers face challenges in their methods and classroom management when it comes to online learning.

Furthermore, to implement effective interventions that positively impact teachers, students, and the overall learning environment, it is imperative to explore assertive classroom management strategies and student interest in mathematics using a prediction model of students' attitudes toward online learning.

The researcher conducted this study to investigate the impact of assertive classroom management strategies, and students' interest in mathematics on student attitudes toward online learning. Specifically, it sought answers to the following objectives: (1) to determine the level of assertive classroom management strategies; (2) to determine the level of students' interest in mathematics; (3) to ascertain the level students' attitude towards online learning; (4) to determine the relationship between assertive classroom management strategies and students' attitude towards online learning; (5) to determine the relationship between students' interest in mathematics and students' attitude towards online learning; (6) To develop a prediction model for student attitude towards online learning about assertive classroom management strategies and student interest in Mathematics.

The study's conceptual framework is below for a clear understanding of the research.

Predictive Variable

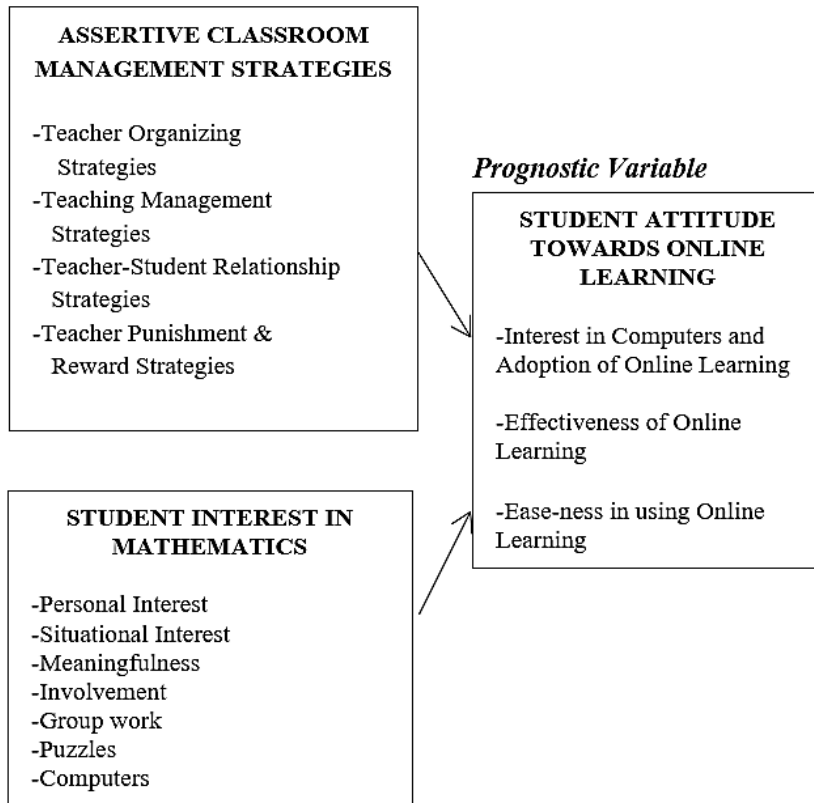


Figure 1. Conceptual Model of the Variables of the Study

According to this study's testing at the 0.05 level of significance, there is no meaningful correlation between the degree of assertive classroom management strategies and students' attitudes toward online learning. There is no significant relationship between student interest in mathematics and students' attitudes toward online learning.

Furthermore, this research study contributed to the existing body of knowledge in context by addressing the issues utilizing the existing methodology and exploring a wide range of new ideas by enhancing the validity and reliability of this research study. Additionally, this research contributes to the advancement of inclusive and equitable quality education, the promotion of lifelong learning opportunities for all, the creation of inclusive, responsible, and productive institutions at all levels, the assessment of justice for all, and the promotion of peaceful, inclusive society for sustainable development.

This study has significant implications for the teaching and learning process, particularly for the effective management of classrooms by teachers and the fostering of students' interest in mathematics through online or face-to-face learning. This research is relevant to the

success of educational strategies as well as the implementation of the teaching process. It generates a diverse array of ideas for parents, schools, teachers, and most importantly, students. They could use the suggested strategy based on the study's results to further improve. Finally, this thesis provides valuable reference information that future researchers can utilize in their scholarly pursuits.

II. METHODS

This section explains the research respondents, materials and instruments, and design and procedures employed in the study.

Research Respondents

The research respondents were students enrolled in the online distance learning modality. The researcher selected Grade 7 to 10 students using a simple random sampling of three hundred (300). Two hundred to three hundred respondents, falling below the diminishing returns barrier, provide a reasonable margin of error (Minsel, 2022). The distribution of respondents included 74 students from Grade 7, 77 students from Grade 8, 86 students from Grade 9, and 63 students from Grade 10, for a total of 300 respondents. The study's findings

focused on the context of the public school, particularly its unique position as the only junior high school in Panabo City offering online distance learning (ODL). The school was located at Brgy. Gredu, Panabo City, Davao del Norte. The school offers both junior high and senior high school programs.

The researcher included the following criteria such as age, sex, or gender, and agreed to respond to the study's survey questionnaire. The researcher excluded students enrolled in modular learning. The respondents' participation was voluntary, and if they chose not to participate, they faced no penalties or loss of benefits. They are free to change their minds at any moment and stop participating without incurring any fees. The participants in this study were not relinquishing any legal claims, rights, or remedies. The sample size and focus of the study limited the findings' potential for general application.

Materials and Instrument

The researcher took and modified materials and instrument questionnaires using a 5-point Likert-type scale. Ullah et al. (2018.) provided the student attitude questionnaire for online learning. Shaver (2010) provided the model for assertive classroom management. Mitchell (1992) sparked the students' interest in mathematics instruments. Moreover, the researcher employed Cronbach's alpha, a measure of consistency within an instrument's scale, to ensure reliability. The results of the Cronbach alpha measured assertive classroom management at 0.788, student's interest in mathematics at 0.853, and student's attitude towards online learning at 0.876. It showed that there was consistency in the responses to the instruments. Before gathering information from the participants, focus groups of education specialists evaluated the questionnaire's validity.

Moreover, the Likert Scale was used to assess the results of the variables. For each item, the research respondent will choose among the 5-point agreeableness scale: 5 for strongly agree (SA), which means the statement is very much observed, 4 for agree (A) or much observed, 3 for moderately agree (MA) or moderately observed, 2 for slightly disagree (SD) or less observed, and 1 for disagree (D) which means not observed.

Design and Procedure

The study employed a predictive correlation research design, utilizing multiple regression analysis. According to Sapra et al. (2021), correlation refers to a statistical

association or relationship between variables; one valid use of regression correlation is prediction. This method aims to determine the extent of a relationship between two or more variables using statistical data; this type of relationship occurs when a change in one causes a change in the other. Bhandari (2023) cites various tools for data collection in correlational research, such as validated questionnaires or scales. The quantitative component serves as a suitable instrument for data collection, enabling the intended respondents to answer the questions.

Following panel members' acceptance, the researcher undertakes the following processes to collect study data. The researcher undergoes pilot testing and submits the manuscript to secure a certificate of approval from U MERC. Afterward, the researcher asks permission from the office of the school principal to conduct the study. Following acceptance, the letter of recommendation will aim to make accommodations for the researcher to give the survey questionnaire to study participants. The participants asked for a truthful and accurate response to the presented item. Furthermore, the researcher retrieved and checked the survey questionnaires. After the respondents completed the questionnaire, the researcher used Microsoft Excel to compile and tabulate all collected data, followed by statistical processing. The statistician calculated, examined and interpreted the statistical findings.

The statistical tools that were used for the data analysis and interpretations are the following: (1) Mean. This statistical tool measures the level of assertive classroom management strategies, student interest in mathematics, and student attitude towards online learning; (2) Pearson r. Used to determine the correlation of assertive classroom management strategies and student interest in mathematics to students' attitude towards online learning; (3) Multiple Regression. This statistical tool investigates the influence of students' interest in mathematics and assertive classroom management methods on their attitudes toward online learning.

The rights to perform the study, confidentiality, and anonymity are ethical issues relevant to this research. Following the evaluation of the study protocol and established criteria, the researcher conducted the study following all ethical standards. The researcher granted the students in Panabo City, Davao del Norte, the freedom to participate without any consequences or loss of benefits. The researcher protects the respondent's personal information with the utmost confidentiality, as

permitted by data privacy law. The researcher securely stores the study material on password-protected computers to prevent any potential harm. Subjected the study to plagiarism detectors like Grammarly software to verify the accuracy and authenticity of the presented data. The study had no trace or evidence of international misinterpretation of what had been done. There was no indication of a conflict of interest in the study, such as the disclosure of a conflict of interest (COI), a set of guidelines wherein used of professional judgment to determine a primary interest and a secondary interest.

The study's findings provide valuable insights for school administrators and teachers, motivating them to implement assertive classroom management strategies. The study aims to enhance students' interest in mathematics during the teaching and learning process, as well as their perspective on online learning. Additionally, the study adhered to the University of Mindanao Ethics Review Committee's requirements for ethical consideration. After the researcher complied

with all the required documents and submitted them to the Ethics and Review Committee, the UMERC issued a Certificate of Approval with a protocol number of 2023-463. The researcher is the sole author of the study, with the expert advice of the research adviser.

III. RESULT AND DISCUSSION

This section presents the results and analysis of the data gathered. The presentation follows the research objectives.

Assertive Classroom Management Strategies

There were four indicators of the level of assertive classroom management strategies: teacher organizing strategies, teacher management strategies, teacher-student relationships strategies, and teacher reward and punishment strategies. Table 1 presents the results for each indicator, showcasing a high overall mean score of 3.73 with a standard deviation of 1.27. This indicates that the components associated with the teacher's assertive classroom management were visible.

Table 1. Level of Assertive Classroom Management Strategies

Indicators	Mean	Standard deviation	Descriptive Level
Teacher Organizing Strategies	3.44	1.25	High
Teaching Management Strategies	4.23	0.89	Very High
Teacher-Student Relationship Strategies	3.88	1.23	High
Teacher Punishment & Reward Strategies	3.21	1.44	Moderate
Overall result	3.73	1.27	High

Table 1 presents variances in the mean scores and standard deviation of assertive classroom management, indicating either high or significant observations. Additionally, the results reveal that teaching management strategies have the highest mean score of 4.23 and SD of 0.89, indicating a high descriptive level. This indicates that the teachers used a variety of management strategies in the classroom. The teacher punishment and reward strategies, with a mean score and SD of 3.21 and 1.44, respectively, have a moderate descriptive level, indicating their typical use. This suggests that teachers use this strategy less frequently, particularly when it comes to the term "punishment." The teacher-student relationship had a mean score and SD of 3.88 and 1.23, and each of the subsequent measures of assertive classroom management, such as the teacher organizing strategies, had a mean score and standard deviation of 3.44 and 1.25. A high descriptive level indicates that these results are frequently visible. A high descriptive level indicates that these results are frequently visible.

Moreover, developing a positive rapport between teachers and students is just one aspect of the battle to create a successful learning environment (Gordon, 2020). In online learning, the student community is equally as crucial as it is in traditional classroom settings. In online learning, it is simple for a student to feel alone. Provide chances for students to work together and even interact as suggested. Positive reinforcement not only produces the desired outcome but also increases engagement, which is essential for an effective online learning environment.

Finally, the presentation of teacher organizing strategies proved beneficial in the online learning environment, as they frequently establish and reinforce routines. Furthermore, assertive classroom management strategies, which help establish the best possible learning environment, greatly influence students' learning.

Student's Interest in Mathematics

Table 2 shows the degree of student interest in mathematics with its indicators: personal interest, situational interest, meaningfulness, involvement, group work, puzzles, and computers. The mean score for students' interest in mathematics was 3.84, with a standard deviation of 1.16, indicating a high or significant level of observation. The teaching and learning process manifests the level of students' interest in mathematics based on the specific items.

The study's findings show that group work consistently received the highest mean score of 4.28 and SD of 0.92, indicating a descriptive level of very high or very much observed use. Working in groups motivated the students to learn mathematics and enabled them to learn effectively and interactively through idea exchange. Additionally, personal interest received the lowest mean score of 3.36 and SD of 1.19, indicating a moderate to moderately observed level of interest. This suggests that the student's perception of their ability to learn mathematics influenced their interests.

Table 2. Level of Students' Interest in Mathematics

Indicators	Mean	Standard deviation	Descriptive Level
Personal Interest	3.36	1.19	Moderate
Situational Interest	4.05	1.05	High
Meaningfulness	4.09	0.97	High
Involvement	3.63	1.24	High
Group work	4.28	0.92	Very High
Puzzles	3.95	1.02	High
Computers	3.48	1.31	High
Overall result	3.84	1.16	High

The data showed that situational interest, with a mean score of 4.05 with an SD of 1.05, and the indicator meaningfulness, with a mean score of 4.09 with an SD of 0.97, exhibited high descriptive levels. Students frequently observe these two indicators in the context of learning engagement, thereby increasing their interest in mathematics. We observed a high descriptive level in the use of puzzles and computers, with mean scores of 3.95 and 3.48, respectively, and SDs of 1.02 and 1.31. This has a significant impact on the students' interest in learning mathematics.

This result is consistent with the study of Hidayat et. al. (2024), which demonstrated that the use of games and puzzles in mathematics instruction raises students' thinking levels and gives them more ability and potential in analytical thinking. Students' interest in mathematics

reveals a deep understanding of the topic. Students' established interest in mathematics has a significant influence on the degree and direction of their approach toward the subject. Any student who has an optimistic attitude toward mathematics studies the subject because he/she enjoys learning mathematical ideas. When given a task they are genuinely interested in, students are more likely to work attentively and efficiently Adigun (2018).

Attitude of Students Towards Online Learning

Table 3 displays the attitude of students towards online learning, along with its indicators such as computer interest, adoption, efficacy, and ease of use. The overall mean score stands at 3.53, with a standard deviation of 1.14, indicating a high or significant level of observation. This indicates that the students' attitudes toward online learning are consistently visible.

Table 3. Level of Student Attitude towards Online Learning

Indicators	Mean	Standard deviation	Descriptive Level
Interest in Computers and Adoption of Online Learning	3.53	1.24	High
Effectiveness of Online Learning	3.33	1.12	Moderate
Ease-ness in using online learning	3.76	1.05	High
Overall result	3.53	1.14	High

Moreover, the indicator effectiveness of online learning received the lowest mean score of 3.33 with a standard deviation of 1.12, suggesting that students' attitudes towards online learning were moderately apparent. Furthermore, the two indicators—computer interest and online learning uptake, as well as the ease of use of online learning—show that the importance of computers as an aid in online learning influenced the students' attitude in the teaching-learning process.

Berico and Traverro's (2023) study consistently revealed students' satisfaction with the implementation of online learning. However, issues like poor internet access and peer pressure made it difficult for the teaching-learning process to proceed. Schools should develop a consistent approach to implementing online learning in light of these issues. This approach should involve providing teachers with an accessible internet connection and working with other stakeholders to address the needs of students enrolled in online classes. Ullah et al. (2018) cited the study of Al-Fahad (2009), which stated that students extensively accepted online learning because it

made it simple for them to search, gain, and work independently on learning materials and resources.

Correlation between Assertive Classroom Management Strategies and Student Attitude towards Online Learning

Illustrated in Table 4 is the overall correlation matrix of assertive classroom management strategies and student attitudes toward online learning. The coefficient of correlation is 0.390, which is above the 0.05 criterion for significance.

The likelihood value shows that there is a relationship between assertive classroom management and students' attitudes toward online learning. The observation of assertive classroom management strategies suggests a corresponding increase in student attitudes toward online learning. Therefore, we reject the null hypothesis, indicating a significant relationship between the two variables.

Table 4. Correlation matrix of the assertive classroom management strategies and student attitude towards online learning

Assertive Classroom Management Strategies	Students' attitude towards online learning;			
	Interest in Computers and Adoption of Online Learning	Effectiveness of Online Learning	Ease-ness in using online learning	Overall
Teacher Organizing Strategies	0.283**	0.200**	0.224**	0.276**
Teaching Management Strategies	0.262**	0.204**	0.211**	0.267**
Teacher-Student Relationship Strategies	0.188**	0.192**	0.190**	0.231**
Teacher Punishment & Reward Strategies	0.370**	0.271**	0.320**	0.390**
Overall	0.374**	0.294**	0.320**	0.390**

Legend: ** p-value is significant at 0.05

Moreover, all four indicators significantly correlated with student attitude towards online learning; the teacher punishment and reward strategies have the highest overall score ($r = 0.390, p < 0.05$), while the teacher-student relationship has the lowest score ($r = 0.231, p < 0.05$). Show in the matrix that the positive correlation of assertive classroom management strategies and student attitude towards online learning with its indicator interest in computers and adoption of online learning has the highest overall score ($r = 0.374, p < 0.05$), ease in using online learning ($r = 0.320, p < 0.05$), while the effectiveness of online learning has

the lowest overall score ($r = 0.294, p < 0.05$). Whether learning takes place in a real classroom or virtually, a productive atmosphere depends on efficient classroom management. Even when students are not in a single room, teachers must be deliberate in managing their conduct and involvement in an online environment (Gordon, 2020). It shows in Table 4 the significant relationship between classroom management strategies and student attitudes toward online learning. Thus, to achieve successful educational outcomes, teachers must be able to control student conduct and maintain order in the classroom, especially in the online setting. Teachers

employed a few strategies that can support the upkeep of an effective online learning classroom environment. Creating an educational experience that will be stimulating for the students is essential and provides multiple opportunities for interactive learning.

Correlation between Student Interest in Mathematics and Student Attitude towards Online Learning

Table 5 displays the correlation matrix between students' interest in mathematics and their attitudes toward online learning.

Table 5. The significant relationship between student's interest in Mathematics and student attitudes toward online learning

Student interest in mathematics	Student attitude towards online learning;			
	Interest in Computers and the Adoption of Online Learning	Effectiveness of Online Learning	Ease-ness in using online learning	Overall
Personal Interest	-0.033	0.030	0.037	0.021
Situational Interest	0.024	0.096	0.065	0.083
Meaningfulness	0.129*	0.128	0.225**	0.195**
Involvement	0.185**	0.137*	0.158**	0.189**
Group work	0.120*	0.169*	0.194**	0.201**
Puzzles	0.254**	0.164**	0.178**	0.230**
Computers	0.342**	0.302**	0.322	0.386
Overall	0.285**	0.279**	0.312**	0.353**

Legend: ** p-value is significant at 0.05

In addition, student interest in mathematics was significantly correlated with student attitude towards online learning except in the indicator personal interest with the overall score ($r = 0.021, p > 0.05$) and situational interest with a score of ($r = 0.083, p > 0.05$), while computer got the highest overall score ($r = 0.386, p < 0.05$). Students' interest in math was strongly linked to how easy it was to use online learning ($r = 0.312, p < 0.05$), how interested they were in computers and using online learning ($r = 0.285, p < 0.05$), and how useful online learning was ($r = 0.279, p < 0.05$).

On the other hand, this study contributed to the existing threads of discussion as it revealed the significant relationship between student interest in mathematics and attitude toward online learning.

The integration of an evolving learning environment, the need for methodological flexibility, and the requirement to increase learning creativity and productivity render integrating emerging technology into the teaching and learning process a necessity rather than a choice. Onyema, (2019). As a result of emerging technologies, software and AI-assisted technology are developing at an exponential rate to tailor curriculum and learning

The overall coefficient of correlation is 0.353, which falls short of the significance level of 0.05.

The probability value shows a relationship between the student's interest in mathematics and the student's attitude toward online learning.

Therefore, we reject the null hypothesis, indicating a significant relationship between the two variables.

strategies to each student's capacity to progress at their speed (Corinne, 2018). Furthermore, technology has transformed the educational approach of instructors, shifting from their traditional role as knowledge providers to a more flexible role as mentors, facilitators, and motivators who encourage students to engage and learn. Onyema et al. (2019).

Moreover, online learning, as opposed to traditional learning, makes it easier to access online resources, databases, journals, and other materials that are typically difficult to obtain in a library.

However, the purpose of online learning is to cater to a variety of student types who may not typically thrive in a traditional classroom setting while also enhancing a typical multipurpose setting to increase its appeal to students.

However, some research findings suggest that students may view in-person instruction more favorably than online instruction in terms of social presence, interaction, satisfaction, and general quality (Nambiar, 2020).

Significant influence of assertive classroom management strategies and student interest in Mathematics on student attitude toward online learning

Model 1	R2 = 0.173	deltaR2 = 0.162	F = 15.463	p-value = 0.000
Model 2	R2 = 0.256	deltaR2 = 0.228	F = 9.025	p-value = 0.000

The regression analysis in Table 6 examines the relationship between the indicators of assertive classroom management strategies, student interest in mathematics, and student attitude toward online learning. We present two models: Model 1, which incorporates indicators of assertive classroom management strategies, and Model 2, which incorporates indicators of student interest in mathematics in the analysis. In Model 1, R2 = 0.173 showed that the predictors in Model 1 account for 17.3% of the variance of student attitude towards online learning. The deltaR2=0.162 represents the increase in R2 compared to an empty model. F = 15.463, p<0.000, indicates that the mode is statistically significant. Even so, in Model 2, R2 = 0.256 indicates that the predictors

in Model 2 explain 25.6% of the variance of student attitude towards online learning. The deltaR2=0.228 represents the increase in R2 when compared to model 1. F = 9.025, p<0.000 indicates that the mode is statistically significant.

In addition to the availability of technological support, the following factors influence teachers' and students' satisfaction with online learning: relationships and communication with teachers, the conduct of online classes, the techniques and procedures used for instruction and evaluation, students' perceptions of the online environment, and prompt and excellent interactions and communication between students and teachers (Coman et al., 2020).

Model	Model	B	SE	Beta	t-ratio	Sig.
1	(Constant)	1.801	.271		6.635	.000
	Teacher organizing strategies	.071	.046	.096	1.550	.122
	Teaching management strategies	.120	.074	.109	1.631	.104
	Teacher-student relationship strategies	.055	.067	.052	.817	.414
	Teacher punishment and reward strategies	.239	.051	.282	4.673	.000
2	(Constant)	1.527	.295		5.171	.000
	Teacher organizing strategies	.018	.046	.024	.390	.697
	Teaching management strategies	.055	.075	.050	.739	.460
	Teacher-student relationship strategies	.047	.065	.045	.720	.472
	Teacher punishment and reward strategies	.166	.052	.195	3.180	.002
	Personal Interest	-.018	.034	-.038	-.543	.587
	Situational Interest	-.043	.052	-.065	-.830	.407
	Meaningfulness	.030	.043	.044	.702	.483
	Involvement	.017	.047	.019	.349	.727
	Group work	.068	.037	.098	1.824	.069
	Puzzles	.088	.038	.142	2.327	.021
	Computers	.118	.027	.245	4.297	.000

Reflected in Table 6, several indicators show a positive relationship with student attitude towards online learning: teaching management strategies ($\beta=0.050$, $t=0.739$, $p=0.460$), teacher-student relationship strategies ($\beta=0.045$, $t=0.720$, $p=0.472$), teacher punishment and reward strategies ($\beta=0.195$, $t=3.180$, $p=0.002$). Additionally, meaningfulness ($\beta=0.044$, $t=0.702$, $p=0.483$), group work ($\beta=0.098$, $t=1.824$, $p=0.069$), puzzles ($\beta=0.142$, $t=2.327$, $p=0.021$), and computers ($\beta=2.450$, $t=4.297$, $p=0.000$) show a significant positive.

There are, however, no statistically significant links between teacher organizing strategies ($\beta=0.024$, $t=0.390$, $p=0.697$), personal interest ($\beta=-0.038$, $t=-0.543$, $p=0.587$), situational interest ($\beta=-0.065$, $t=-0.830$, $p=0.407$), and involvement ($\beta=0.019$, $t=0.349$, $p=0.727$) and how students feel about online learning in Model 2. This signifies that the other indicators could have substantially greater predictive value than the given indicators.

Furthermore, taking into account both the advantages of online learning and the challenges previously discussed, we think that the shift to fully online instruction impacted both the teaching-student process and the exchange of information between teachers and students.

Based on pedagogical research, teachers must address four primary issues in online education to enhance their ability to successfully teach distance learning programs and advance their professional development for online and blended learning.

Jurakovic et al. (2022) mention that these problems include establishing relationships with students, managing their functions as managers, providing technical support, and demonstrating teaching skills in an online classroom.

Final Prediction Model

The following linear model sheds light on the various indicators that influence student attitudes toward online learning. Relatable indicators of student interest in mathematics, like meaningfulness, group work, and puzzles, significantly positively influence the student's attitude toward online learning, thereby boosting their interest in learning and studying mathematics. Additionally, teaching strategies for managing teacher-student relationships, as well as teacher reward and punishment techniques, significantly influence how students learn and teach. Conversely, individual differences and environmental settings negatively impact student attitudes toward online learning through personal interest, situational interest, and involvement.

Furthermore, the inclusion of organizing strategies suggests a negative impact, as the unique circumstances of distance learning necessitate the application of additional strategies specific to this context.

Table 7. Final Prediction Model

$Y = 1.527 + 0.018X_1 + 0.055X_2 + 0.047X_3 + 0.166X_4 - 0.018X_5 - 0.043X_6 + 0.30X_7 + 0.017X_8 + 0.068X_9 + 0.088X_{10} + 0.118X_{11}$	
where	
X₁	Teacher Organizing Strategies
X₂	Teaching Management Strategies
X₃	Teacher-Student Relationship Strategies
X₄	Teacher Punishment & Reward Strategies
X₅	Personal Interest
X₆	Situational Interest
X₇	Meaningfulness
X₈	Involvement
X₉	Groupwork
X₁₀	Puzzles
X₁₁	Computers

Consistent in the study of Jurakovic et al. (2022), several factors are critical to students' and teachers' satisfaction with online teaching and learning, including student-teacher interaction, timely student-teacher interaction, creative course content, the availability of technical support, and flexibility of online courses in comparison to in-person ones. It's important to use interactive Q&A sessions, presentations, and open conversations to transform students from passive recipients into engaged learners when teaching online.

On the other hand, unlike online contact, in-person courses allow students to provide immediate feedback on the quality of instruction, delivery, and overall

experience. Teachers speak with students as soon as they walk into the classroom. The teacher can immediately adapt their teaching style to meet the needs of the students by observing their body language, which includes their smile, gaze, hand gestures, attire, and other non-verbal indicators. Burac et al. (2019).

The level of connection, engagement, and interest students develop during online learning determines the effectiveness of the teaching method. Students must transfer their knowledge to daily life. This study intends to support the group effort to use technology to empower students and support their educational journey by examining the complexities of the digital world via an

empirical lens. This study holds significance as it demonstrates the impact of technology on students' motivation and involvement in online math instruction. Mohammed (2024).

IV. CONCLUSION AND RECOMMENDATION

The study's findings solidly supported the fundamental theories of the research. The study found the highest level of student interest in mathematics, with group work being the most highly rated indicator, and moderately observed personal interest. Similarly, students gave high ratings to assertive classroom management strategies, rated teaching management strategies as the highest or most observed, and observed teacher punishment and reward strategies moderately. Lastly, students' attitudes towards online learning also demonstrated high ratings or were heavily observed, with signs of interest in computers and the adoption of online learning as well as its ease of use receiving significant attention. However, the study revealed a moderate effectiveness of online learning.

The researcher suggests that teachers use the strategy based on the study's findings to enhance their teaching methods. Educational institutions may use the study's conclusions to develop formalized approaches to improve students' mathematical learning.

These findings suggest that teachers' creation of a learning environment positively impacts students' interests and attitudes. By using this data, teachers may accurately assess the effectiveness of the learning environments they establish.

Teachers can promote learning and assist students in achieving their full potential by improving the quality of the learning environment. Teachers and students should cultivate a positive relationship. Provide students with an opportunity to work together and even socialize. Give students activities or tasks that will collaborate with their group mates.

Routines matter in any learning setting, but they're especially important when you can't see your students daily. It is a beneficial idea to simplify routines. With the work they receive each week, students will also be better able to create their routines at home.

Providing guidance and comments tailored to each student's needs regularly can also contribute to the development of a more personalized and engaging learning environment.

Teachers should focus on selecting and making educational materials that are engaging, relevant, and consistent with the interests and preferences of their students. The use of new methods, making known the usefulness of the concepts, and intellectual curiosity are the primary stimuli for the awakening of students' interest and achievement in mathematics. We can make students' learning more engaging and entertaining by using interactive exercises, real-world examples, and multimedia materials.

The use of computers, puzzles, and games in teaching and learning was also important. Teachers can utilize professional development programs to equip themselves with the necessary skills and knowledge to successfully achieve students' full potential, particularly in understanding mathematical problems. It is crucial to boost teachers' ICT knowledge and skills, empowering them to tackle future challenges.

Even though online learning might save time, both teachers and students believe that it is less structured and effective than traditional classroom instruction.

Furthermore, the results of the data analysis further enhance the concepts and facts discussed in this research study, paving the way for future research. It is crucial to acknowledge students who demonstrate engagement, productivity, and online learning.

Naturally, this is fundamental in every classroom. Teachers will not give online students the same congratulatory high five or proud smile as they would in a traditional classroom. Make use of the channels of communication at your command to inform students when they are going in the right direction.

The study's outcome suggests that the respondents were effective due to their participation in a specialized science curriculum and their high level of critical thinking. Some students had trouble adapting to online learning, but their teachers' strategies helped.

Assertive classroom management indicates a correlation between students' interest in mathematics and their attitude toward online learning, which in turn influences one another. The descriptive and regression results showed evidence that classroom management was important for students' behavior. This also gives validity to influencing students' interest and motivating positive attitudes, which were likely to develop through the teacher's managing styles.

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ISSN: 2582-6832