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The Relationship of Student's Attitudes Towards Online-Based Learning and Science Learning Anxiety in the New Normal Education

Edrian G. Sabate^{1*}, Earl Francis D. Tesaluna¹, Ivy Grace Gian¹, Wayne Jewel Bagaol¹, Julia Mae Gocotano¹

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ABSTRACT

Understanding students' attitudes towards online-based learning and its impact on science learning anxiety is crucial in the new normal of education. Thus, this study investigates this relationship among senior high school students' attitudes towards online-based learning and science learning anxiety during the new normal education implemented during the COVID-19 pandemic. Moreover, this study aims to determine students' attitudes towards online-based learning, the level of science learning anxiety, and whether a relationship exists between the identified variables. A descriptive-correlational design was used to address these objectives using 100 sampled respondents implemented via a survey questionnaire. Results indicate that students generally have a positive attitude towards online-based learning, with high adaptability being the most notable aspect. However, engagement levels were relatively low. Additionally, science learning anxiety was found to be high, especially among students who experienced disappointment. A moderate positive correlation between attitudes toward online-based learning and science learning anxiety was observed, indicating that better acceptance and use of technology can help reduce anxiety. This study underscores the importance of addressing students' emotional well-being in online learning environments. By understanding their attitudes and providing appropriate support, educators can mitigate science learning anxiety and enhance student performance in the new normal of education.

INTRODUCTION

Understanding students' attitudes towards this mode of learning is crucial in the context of the new normal in education, characterized by the prevalence of online-based learning. This is particularly relevant given the rise of science learning anxiety, which has become a significant concern, highlighting the challenges students face in adapting to new learning environments and methodologies, especially in science education. Online learning encompasses all forms of teaching and learning facilitated by Information and Communication Technologies (Guri-Rosenblit, 2005). Various information systems (IS) have since enhanced the interactivity of online learning, enabling activities such as video sharing, audio communication, discussion boards, and live interactions between students and professors over the Internet. These advancements have brought the online learning experience closer to on-campus education (Ferratt & Hall, 2009). Mallow & Greenburg (1983) defined science anxiety as an aversion to scientific concepts, situations involving science, and experts in the field, often resulting in a reluctance to engage with scientific apparatus in academic settings. Individuals with long-term science anxiety typically hold negative views toward science. A study by Fia *et al.* (2022) revealed that students experienced anxiety related to science homework, entering science classrooms, solving science problems, and interacting with science teachers. In response to the challenges of the current crisis, UNESCO (2020) noted that educational institutions

have had to shift towards asynchronous learning and away from traditional face-to-face instruction. Long-term isolation has created numerous challenges for students engaged in online education (Bao *et al.*, 2020). The World Health Organization (2020) has also raised concerns about the psychosocial and mental health effects of the pandemic. Anxiety has been a significant factor in new strategies during the pandemic, such as self-isolation and quarantine. Studies on the impact of COVID-19 and lockdowns on Chinese college students have found significant negative effects on their psychological well-being and increased anxiety levels (Bao *et al.*, 2020). In the Philippines, approximately 28 million students across all educational levels have had to stay home and adhere to health and quarantine protocols due to the spread of a contagious virus that threatens their health and well-being. The transition from traditional to online-blended learning modes has significantly impacted students' education due to inadequate internet access (Languita *et al.*, 2023; UNESCO, 2020). Limited exposure to technology, coupled with uncertainties about the pandemic's impact on education and safety, has led to heightened anxiety and stress among students (Cao *et al.*, 2020). A local study by Diez *et al.* (2021) found that students from UM Digos College have struggled to adapt to the new normal, primarily due to slow internet connections and technical issues with the learning management system, resulting in negative experiences with online learning. Given this context, there is a need to further explore students' attitudes towards online learning

¹ Department of Teacher Education, University of Mindanao, Digos, Philippines

* Corresponding author's e-mail: e.sabate.62320.dc@umindanao.edu.ph

in the new normal, particularly within the context of the University of Mindanao Digos College.

This study aims to determine the relationship between online learning and science learning anxiety among senior high school students. Specifically, this sought to answer the following Questions: 1. What is the level of student's attitude towards online-based learning in the new normal? 2. What is the level of science learning anxiety of students in the new normal? 3. Is there a significant relationship between attitude towards online-based learning and science learning anxiety in the new normal?

METHODOLOGY

This study uses a descriptive-correlational research design to address the study's main objective. A descriptive method identifies behavior (Alejandria *et al.* 2023) and, together with a correlation method, determines whether a relationship or association exists between two or more variables. It also seeks to determine whether one variable affects the other variable (Lawless & Heymann, 2010). This type of method identifies the relationships between the two factors and allows the researchers to gather information from the respondents without having any difficulties in answering the required data for the researchers to have information regarding attitudes towards online-based and science learning anxiety in the new normal education. Moreover, this study was conducted at UM Digos College, a school in Davao del Sur, Philippines. The target respondents of this study were secondary education science students enrolled in the academic year 2023-2024. Securing approval letters and consent forms were conducted first before the conduct of the study. Moreover, 100 secondary education science respondents participated in the study. These respondents were chosen since they experienced online learning during the Covid-19 pandemic.

This study used the adopted survey questionnaire from the study of Acuña *et al.* (2021) entitled "Exploring Students' Attitude Towards Online-Based Learning System in the New Normal: An Exploratory Factor Analysis" with 6 indicators and Degorio *et al.* (2023) entitled "Exploring Science Learning Anxiety in the New Normal - An Exploratory Factor Analysis" with 4 indicators. The researchers asked first permission from the authors to use the questionnaire in the study. After the approval, the researchers then asked the permission from the school to conduct the study. After the approval, the researchers asked the permission from the respondents for their approval to be the respondents of this study. In addition, the survey runs from March 2024 and data analysis was then carried out after achieving the right sample size for this study. In data analysis, the use of mean, standard deviation, and Pearson correlation analysis was used. In the interpretation of the mean for both attitudes toward online-based learning and science learning anxiety, the researchers used the suggested range of means by Bringula *et al.* (2012) cited by Diquito *et al.* (2024) (see Table 1). Moreover, the used of Pearson

correlation values by Wahyuni & Purwanto,(2020) were used in the analysis of the correlation result of attitudes toward online-based learning and science learning anxiety (see Table 2).

Table 1: Range of Means

Scale	Mean Range	Verbal Interpretation
5	4.51 - 5.00	Very High
4	3.51 - 4.50	High
3	2.51 - 3.00	Neutral
2	1.51 - 2.50	Low
1	1.00 - 1.50	Very Low

Table 2: Interpretation of Pearson Correlation Coefficient Values

Interval Coefficient	Relationship Level
0.80 - 1.00	Very Strong
0.60 - 0.799	Strong
0.40 - 0.599	Moderate
0.20 - 0.399	Weak
0.00 - 0.199	Very Weak

RESULTS AND DISCUSSION

Table 3 shows the level of attitude of respondents towards online-based learning. Data shows that the overall perceived personality attitude of surveyed respondents is interpreted as high ($\bar{x} = 3.77$, $SD = 0.58$). The result of the study is supported by Nguyen (2015), who found that online learning environments generally lead to positive student outcomes due to their flexibility and ability to cater to individual learning needs. In addition, all of the indicators of the personality traits are interpreted as high. Though all indicators are high, the adaptability indicator ($\bar{x} = 3.99$, $SD = 0.70$) is the highest. Besser *et al.* (2022) noted that adaptability is crucial for success in online education. While the indicator engagement is perceived as the lowest in the attitude towards online-based learning ($\bar{x} = 3.49$, $SD = 0.92$). This result is supported by findings from Acuña *et al.* (2021), which revealed that students displayed moderate levels of engagement in online learning environments. Despite high levels in other dimensions like convenience and technology

Table 3: Attitude Towards Online-Based Learning

	Mean	SD
Engagement	3.49	0.92
Convenience	3.65	0.79
Satisfaction	3.73	0.73
Technology Acceptance	3.85	0.64
Adaptability	3.99	0.70
Interaction	3.93	0.88
Overall Attitude	3.77	0.58

acceptance, engagement remained relatively lower, reflecting challenges in maintaining student involvement and interest in virtual settings.

Table 4 shows the level of Science Learning Anxiety of respondents towards new normal education. Data shows that the overall perceived Science Anxiety of surveyed respondents is interpreted as high ($\bar{x} = 4.05$, $SD = 0.57$). The result of the study is supported by findings that isolation and limited social interactions caused by stay-at-home orders during the pandemic could lead to anxiety and depression, as noted by Hiremath *et al.*, (2020). In addition, all of the indicators of the science learning anxiety in the

new normal education are interpreted as high. Though all indicators are high, the disappointment ($\bar{x} = 3.99$, $SD = 0.70$) is considered the highest. This means that students who possess high organizational skills tend to experience higher anxiety when adapting to new learning formats and disappointments, as highlighted by England *et al.*, (2019). While the indicator learner's interaction is perceived as the lowest in the science learning anxiety in the new normal education ($\bar{x} = 3.91$, $SD = 0.76$). This result is supported by research conducted by Barrot *et al.* (2021) which found that students with lower response rates to new educational challenges exhibited reduced anxiety levels.

Table 4: Science Learning Anxiety in the New Normal Education

	Mean	SD
Attitude	4.13	0.63
Learner's Interaction	3.91	0.76
Learning Environment	4.00	0.81
Disappointment	4.15	0.63
Overall	4.05	0.57

Table 5 shows the intercorrelation of attitudes toward online-based learning and science learning anxiety in the new normal education. Data shows that attitudes toward online-based learning and Science Learning Anxiety in the New Normal Education exhibited a moderate positive correlation ($r = .516$, $n = 100$, $p < 0.05$). This means that both variables exhibited a moderate relationship. This result is also supported by research from Anderson *et al.* (2021), who found that students' attitudes toward online learning significantly influenced their anxiety levels during

the pandemic. Moreover, in terms of the indicators of each variable, only the variables of technology acceptance and attitude ($r = .667$, $n = 100$, $p < 0.05$), technology acceptance and Disappointment ($r = .612$, $n = 100$, $p < 0.05$), and interaction and attitude ($r = .600$, $n = 100$, $p < 0.05$) demonstrate a significant strong positive correlation. This result is also supported by (Liu & Huang, 2011), who highlighted the significant impact of technology acceptance on students' emotional responses in online learning environments.

Table 5: Correlation Matrix of Attitude Towards Online-based learning and Science Learning Anxiety in the New Normal Education

Attitude Towards Online-Based Learning	Science Learning Anxiety in the New Normal Education				
	Attitude	Learners Interactions	Learning Environment	Disappoint-ment	Overall
Engagement	.313*	.237*	.134	.179	.227*
Convenience	.201*	.177	.163	.216*	.197*
Satisfaction	.403*	.318*	.235*	.310*	.327*
Technology Acceptance	.667*	.375*	.387*	.612*	.597*
Adaptability	.548*	.465*	.434*	.593*	.582*
Interaction	.600*	.304*	.260*	.459*	.472*
Overall	.593*	.406*	.343*	.506*	.516*

* $p < 0.05$

In terms of the correlation result of the overall attitude towards online-based learning and science learning anxiety, all indicators show a moderate to very weak significant correlation only. The highest relationship can be observed between technology acceptance and overall science learning anxiety ($r = .597$, $n = 100$, $p < 0.05$). This result is also supported by research from Zhao and Kemp (2021), which demonstrated that technology acceptance

in education is closely linked to correlation anxiety levels among students. While convenience and overall science learning anxiety exhibited a significant, very weak correlation ($r = .197$, $n = 100$, $p < 0.05$). This result is also supported by Pham *et al.* (2022), who found a minimal correlation between the perceived convenience of online learning and students' anxiety.

CONCLUSION

This study sheds light on the relationship between students' attitudes toward online-based learning and their science learning anxiety in the new normal education setting. It is clear that how students feel about online learning can have a big impact on their anxiety levels, especially when it comes to science. We found that students generally like the flexibility of online classes but struggle to stay engaged without face-to-face interaction. Students who are really good at organizing things seem to feel more anxious about adapting to new learning formats. This suggests that offering support tailored to different learning styles could help ease their anxiety. Our research also showed that the more students accept and use technology in their learning, the less anxious they tend to be. This highlights the importance of integrating technology effectively into online education. The study emphasizes the need to support students' emotional well-being in online learning environments. By understanding their attitudes and providing the right support, we can help students thrive in the new normal of education.

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