
Factors Associated with Preference for Online Learning Modality Among Medical Students of a Private Medical School in Quezon City, Philippines: An Analytical Cross-Sectional Study

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Abstract

Introduction The COVID-19 pandemic accelerated the adoption of alternative instructional approaches, including distance and online learning. This study aimed to determine factors associated with preference for online learning modality among medical students at a private medical school in the National Capital Region (NCR).

Methods An analytical cross-sectional study was conducted among 367 medical students using convenience sampling. Participants completed an online survey assessing preferred learning modality, general anxiety, self-efficacy, and satisfaction with online learning. Factors associated with preference for online learning were identified using logistic regression analysis.

Results Most respondents (79.3%) preferred traditional face-to-face learning, whereas 20.7% preferred online learning. Male students were more likely to prefer online learning than female students (OR = 2.19, $p = 0.003$). Married students were more likely to prefer online learning than unmarried students (OR = 9.71, $p = 0.021$). Students who reported greater satisfaction with their online learning experience were more likely to prefer online learning (OR = 2.28, $p = 0.024$). Self-efficacy demonstrated a borderline association with preference for online learning (OR = 0.42, $p = 0.053$).

Conclusion Sex, civil status, and satisfaction with online learning were significantly associated with preference for online learning modality. Self-efficacy demonstrated a borderline association. Despite the increased use of online learning during the COVID-19 pandemic, most respondents continued to prefer traditional face-to-face instruction.

Key words: Education, online learning, medical students, anxiety, self-efficacy, satisfaction

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The COVID-19 pandemic significantly transformed educational systems worldwide and accelerated the adoption of distance and online learning modalities. Although face-to-face instruction has largely resumed, many educational institutions continue to incorporate online learning because of its flexibility, accessibility, and operational efficiency. A national survey involving 3,813 medical students in the Philippines identified major barriers to online learning, including difficulty adapting learning styles to the new modality, increased household responsibilities, and poor communication or unclear instructions from educators.¹ Additional concerns included limited access to reliable internet connectivity, inadequate learning spaces, lockdown-related restrictions, and sociopolitical issues.¹ Another study reported that students who transitioned from traditional face-to-face instruction to online learning experienced negative emotions such as fear, anger, and helplessness.² Reduced social interaction in online environments was also associated with diminished well-being and increased anxiety among students, while educators encountered challenges in developing effective teaching strategies and adapting course delivery to the online learning environment.²

In 2022, the Commission on Higher Education (CHED) issued Commission Memorandum Order No. 9, which provided guidelines for the resumption of face-to-face classes in higher education institutions (HEIs). The policy allows HEIs, including state and local universities and colleges, to determine the most appropriate learning modality for their respective contexts while ensuring continuity and quality of education.³ Consequently, many institutions have adopted flexible approaches that integrate face-to-face and online learning modalities.

Recent evidence suggests that online and blended learning continue to play a substantial role in medical education even after the resumption of face-to-face classes. A multinational study involving medical students from 15 institutions across seven countries found that blended learning was the most preferred modality because of its flexibility, convenience, reduced travel time, and ability to accommodate diverse learning needs.⁴ However, students also reported persistent challenges, including internet connectivity issues and concerns regarding the adequacy of online learning for clinical skills acquisition and direct patient interaction.⁴ Similarly, studies conducted in higher education settings have shown that students' learning modality preferences are

influenced by perceived educational quality, logistical considerations, prior experiences with online learning, and overall well-being.⁴ These findings highlight the continued relevance of understanding learning modality preferences in the post-pandemic educational environment.

Despite the widespread implementation of blended and flexible learning approaches, students may differ in their preferred learning modality because of factors such as socio-demographic characteristics, anxiety levels, self-efficacy, and satisfaction with online learning. While previous studies have explored the benefits and challenges associated with online learning, limited evidence is available regarding the factors that influence learning modality preferences among medical students, particularly in the post-pandemic educational environment. This study aimed to determine the preferred learning modality among medical students and identify factors associated with preference for online learning.

Methods

The study was approved by the University's ethics review committee. An analytical cross-sectional study was conducted among 367 medical students enrolled in a private medical school during Academic Year 2023–2024. Eligible participants were: (1) 18–34 years of age, (2) enrolled as regular second- or third-year medical students, and (3) had at least one year of online learning experience. Students without prior face-to-face medical learning experience were excluded. For the purposes of this study, online learning included fully online, blended, and hybrid learning modalities.

Participants were recruited through convenience sampling. The sample size was calculated using estimates derived from two previous studies.^{6,7} Calculations were based on formulas for estimating population proportions, testing differences between group means (age, self-efficacy, and satisfaction), and testing differences between group proportions (year level). A significance level of 5%, a precision level of 0.05 for estimation, and a statistical power of 80% were used.

Data were collected over a two-month period through an online survey disseminated via social media platforms, including Facebook, X (formerly Twitter), and Instagram. The survey consisted of an informed consent form, a socio-demographic questionnaire, and

instruments assessing learning modality preference, anxiety, self-efficacy, and satisfaction with online learning.

The study instruments were pilot tested prior to data collection. Evidence supporting their validity and reliability has been established in previous studies. The Generalized Anxiety Disorder-7 (GAD-7) demonstrated excellent internal consistency (Cronbach's $\alpha = 0.92$). The Online Learning Self-Efficacy Scale (OLSES) showed good internal consistency, with Cronbach's α values of 0.890, 0.855, and 0.843 for the learning, time management, and technology subscales, respectively. Satisfaction with online learning was assessed using the Student Critique of Online Course Survey. Participants were asked to rate their overall satisfaction with their online learning experience on a 5-point Likert scale ranging from 1 ("not at all satisfied") to 5 ("extremely satisfied").⁷

Anxiety was measured using the Generalized Anxiety Disorder-7 (GAD-7), a validated 7-item instrument rated on a 4-point Likert scale ranging from 0 ("not at all") to 3 ("nearly every day"). Total scores range from 0 to 21 and are classified as minimal (0–4), mild (5–9), moderate (10–14), or severe (15–21) anxiety.⁸

Data were processed and analyzed using Microsoft Excel (version 16, 2022) and IBM SPSS Statistics version 24. Categorical variables were summarized as frequencies and percentages. Associations between demographic characteristics, anxiety level, self-efficacy, satisfaction with online learning, and preference for online blended learning were assessed using the chi-square test or Fisher's exact test, as appropriate. Variables identified as potential predictors were entered into a multivariable logistic regression model, and backward elimination was used to determine factors independently associated with preference for online blended learning. Crude and adjusted odds ratios (ORs) with corresponding 95% confidence intervals (CIs) were calculated. Statistical significance was set at $p < 0.05$.

Permission to use the study instruments was obtained via email from their respective developers: Spitzer, Kroenke, Williams, and Löwe for the Generalized Anxiety Disorder-7 (GAD-7) scale; Zimmerman and Kulikowich for the Online Learning Self-Efficacy Scale (OLSES); and Artino for the Student Critique of Online Course Survey used to assess satisfaction with online learning.

Results

There were 367 respondents; 61.6% were females, and 38.4% were males. Majority (91%) were less than 30 years old. Forty-five percent were enrolled as second year medical students, and 54.8% were enrolled as third year medical students. A significant proportion (98.6%) were unmarried. Most respondents (79.3%) preferred face-to-face learning compared to 20.7% who chose online as their preferred learning modality (Table 1).

Table 1. Profile of the respondents.

Demographic factors	No. (%)
Sex	
Male	141 (38.4)
Female	226 (61.6)
Age group	
< 30 years old	334 (91.0)
≥ 30 years old	33 (9.0)
Year level	
Second	166 (45.2)
Third	201 (54.8)
Civil status	
Married	5 (1.4)
Unmarried	362 (98.6)
Preferred learning modality	
Face-to-face	76 (79.3)
Online	29 (20.7)

A significant number (74.1%) had minimal to mild anxiety levels. Severe anxiety was reported among 35 (9.5%) respondents. More than half (61.3%) had very low self-efficacy and only 11 (3.0%) had very high self-efficacy. On satisfaction for online learning, 271 (73.8%) were "somewhat" to "quite satisfied" with their current online learning experience. Thirteen (3.5%) respondents were not at all satisfied (Table 2).

More females (84.1%) than males (71.6%) preferred face-to-face learning than online. This was also the preferred learning modality for all age groups and year levels. However, among the married respondents, online was the preferred learning modality. Face-to-face learning was the preferred learning modality regardless of anxiety level and degree of self-efficacy. Whether or not the respondent was satisfied with online learning, face to face learning

Table 2. Anxiety, self-efficacy, and satisfaction levels of the respondents.

Anxiety Level	No. (%)
Minimal	126(34.3)
Mild	146(39.8)
Moderate	60(16.4)
Severe	35 (9.5)
Self-Efficacy	
Very low	225(61.3)
Low	82(22.3)
Medium	37(10.1)
High	12 (3.3)
Very high	11 (3.0)
Satisfaction for Online Learning	
Not at all satisfied	13 (3.5)
Slightly satisfied	77(21.0)
Somewhat satisfied	152(41.4)
Quite satisfied	119(32.4)
Extremely satisfied	6 (1.6)

was still preferred. On crude analysis, sex ($p=0.004$) and level of satisfaction ($p=0.022$) were significantly associated with preference for online learning (Table 3).

In the final logistic regression model, male sex (AOR = 2.19, $p = 0.003$), married status (AOR = 9.71, $p = 0.021$), and greater satisfaction with online learning (AOR = 2.28, $p = 0.024$) were significantly associated with preference for online learning. Higher self-efficacy showed a borderline association with a lower likelihood of preferring online learning (AOR = 0.42, $p = 0.053$) (Table 4).

Discussion

The findings of the present study showed that the majority of medical students preferred face-to-face learning over online learning. Among the sociodemographic factors examined, sex and civil

Table 3. Crude association between demographic factors, anxiety level, self-efficacy, and satisfaction on one's preference for online medical learning modality.

Factors	Preference for online learning No. (%)	Preference for face-to-face learning No. (%)	Total	p-value*
Sex				0.004
Male	40 (28.4)	101 (71.6)	141	
Female	36 (15.9)	190 (84.1)	226	
Age Group				0.539
< 30 years old	71 (21.3)	263 (78.7)	334	
≥ 30 years old	5 (15.2)	28 (84.4)	33	
Year Level				0.605
Second	32 (19.3)	134 (80.7)	166	
Third	44 (21.9)	157 (78.1)	201	
Civil Status				0.062†
Married	3 (60.0)	2 (40.0)	5	
Unmarried	73 (20.2)	289 (79.8)	362	
Anxiety Level				0.623
Minimal to Mild	58 (21.3)	214 (78.7)	272	
Moderate to Severe	18 (18.9)	77 (81.1)	95	
Self- Efficacy				0.059
Very low to Low	69 (22.5)	238 (77.5)	307	
Medium to Very high	7 (11.7)	53 (88.3)	60	
Satisfaction for online learning				0.022
Not at all satisfied to Slightly satisfied	11 (12.2)	79 (87.8)	90	
Somewhat to Quite to Extremely satisfied	65 (23.5)	212 (76.5)	277	

*Chi square test

†Fisher's exact test

Table 4. Final logistic regression on factors associated with preference for online medical learning modality.

Factors	β coefficient	Prevalence ratio (95% CI)	p-value
Sex	0.78	2.19 (1.30, 3.69)	0.003
Civil Status	2.27	9.71 (1.42, 66.61)	0.021
Self-efficacy	-0.86	0.42 (0.18, 1.01)	0.053
Satisfaction for online learning	0.82	2.28 (1.12, 4.65)	0.024

status were significantly associated with preference for online learning modality. These findings are consistent with previous reports indicating that medical students generally favor face-to-face and blended learning over fully online instruction.⁹ Nevertheless, online learning was perceived as an appropriate modality for delivering theoretical content and selected clinically-oriented activities, such as case discussions and history-taking exercises, although it was not considered a substitute for face-to-face learning.⁹

The preference for face-to-face learning has been attributed to challenges encountered during online learning, including difficulties during online examinations, technical issues, and limited opportunities for interaction. Consistent with the present findings, a pre-pandemic study reported that the absence of fixed schedules and reduced external pressure were among the reasons medical students did not favor online learning.¹⁰ Similarly, a study conducted during the COVID-19 pandemic found that approximately half of the students preferred face-to-face learning over online or blended modalities. Students also perceived face-to-face instruction to be substantially more effective than online learning for teaching clinical skills (89% vs. 18%) and developing social competencies (67% vs. 27%).¹¹

A previous study reported that most married respondents preferred online learning because its flexibility allowed them to balance academic responsibilities with household and family obligations.¹² This finding may partly explain the observed preference for online learning among married students in the present study. However, the number of married respondents was small, and the resulting estimate should be interpreted with caution. Furthermore, evidence regarding the influence of marital status on online learning remains limited. A study conducted in Malaysia found insufficient evidence to establish an association between marital status and the effectiveness of online learning.¹³ Differences between the present findings and previous reports may be attributable to

variations in study populations, educational settings, and contextual factors.

Numerous studies have explored the impact of gender on online learning outcomes.^{14,15} Males generally had a more positive attitude than females on technology and its usefulness and self-efficacy (e.g., self-confidence in one's ability to learn and use technology effectively). The results of this study suggested that women generally were less inclined in using technology than males.

Most participants (74.1%) had minimal to mild anxiety but there was no significant association found with preference for online learning. A study conducted in Romania found students who were accustomed to face-to-face learning and were subsequently enrolled in an online platform developed high levels of negative emotions such as fear, anger, or helplessness.² The implementation of online classes also limited students' social interactions with each other, contributing to the negative emotions and reduced well-being of students. Moreover, online classes had a negative impact on students as they experienced anxiety and panic while using online platforms for learning. Overall, females reported higher levels of anxiety in GAD-7, before and after online learning. Medical students reported higher levels of anxiety before online learning compared to non-medical students. Hence, there was no association between anxiety and an online learning setup.¹⁶

The current study also showed that the majority of the respondents preferred face-to-face learning but were also satisfied with their online learning experience. This may be counterintuitive if one assumes that satisfaction for online learning would also skew the results towards online learning. In a study done in a university in Saudi Arabia, only 30% of the student sample were satisfied with online learning.¹⁷ More importantly, high-achieving students with GPA higher than 3.5 were less satisfied. In conclusion, the level of satisfaction for online courses during the COVID-19 pandemic was low, especially among high-achieving students. However, both students and faculty favored

the blended format over a face-to-face setup for future purposes.

Several pre-pandemic studies showed online learning provided many positive learning experiences for online learners and learners were more satisfied with online learning than traditional face-to-face learning.^{18,19} However, some studies showed online learning was not as satisfying as face-to-face learning and that online learners had poorer engagement with online learning.²⁰ Satisfaction with online learning may not necessarily translate to a preference for a learning modality. It is possible that at the specific point in time when the respondents answered the survey, they were satisfied with online learning. But since the one-item question on preference was worded in a way that considered the future, the preference for face-to-face was stronger.

The majority of the medical students surveyed demonstrated very low self-efficacy for online learning. While higher self-efficacy tended to be associated with a lower preference for online learning, the association did not reach statistical significance. Similar findings have been reported in previous studies, in which students generally perceived face-to-face learning to be more effective than online learning for knowledge acquisition.¹¹

Limitations

The study sample was composed of medical students from a single medical school and may not be representative of the broader population of medical students. Consequently, the generalizability of the findings is limited. In addition, the use of convenience sampling may have introduced selection bias. Satisfaction with online learning was assessed using a single-item question derived from the Student Critique of the Online Course Survey, which did not allow for a comprehensive evaluation of the factors influencing student satisfaction. Other determinants of satisfaction, such as perceived ease of use, perceived usefulness, and learner engagement, were not explored.²¹ Similar limitations were present in the assessment of preference for online learning, which was likewise measured using a single-item question, although previous studies have employed similar approaches.^{22,23} Furthermore, the GAD-7 assessed

generalized anxiety symptoms and did not specifically evaluate anxiety related to the online learning environment, thereby limiting the interpretation of anxiety in relation to learning modality preference.

Conclusions

The majority of the surveyed medical students preferred face-to-face learning over online learning. Sex, civil status, and satisfaction with online learning were significantly associated with preference for online learning modality. Male students were more likely than female students to prefer online learning. Although anxiety levels were assessed, no significant association was observed between anxiety and learning modality preference. Notably, many students reported satisfaction with online learning despite expressing a preference for face-to-face instruction.

Recommendations

Future studies should employ probability-based sampling techniques and include participants from multiple medical schools to improve the representativeness and generalizability of the findings. The use of multidimensional and validated instruments to assess preference for online learning and satisfaction with online learning is also recommended to provide a more comprehensive understanding of these constructs. Additionally, future research should consider utilizing instruments that specifically measure anxiety related to online learning environments rather than generalized anxiety symptoms. Further investigation of the individual domains of online learning self-efficacy, including learning, technology use, and time management, may provide deeper insights into their relationship with learning modality preferences.

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