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Online Learning Satisfaction in Philippine Higher Education: A Structural Equation Modeling

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Abstract: Online Learning Satisfaction in Philippine Higher Education; A structural equation modeling. Philippine higher education institutions have utilized online learning to improve instructional delivery. Several studies have demonstrated that online education can be as effective as traditional classroom models. However, only a few studies ventured toward investigating learner satisfaction in the areas of motivation, school climate, and online learning self-efficacy, which provides a different perspective on assessing online learning delivery. A cross-sectional survey evaluating 580 valid responses addressed this gap. Motivation, school climate, and online learning self- efficacy predicted online learning satisfaction. The study examined five hypothesized paths using Partial Least Squares - Structural Equation Modeling. Results highlight the positive impact of motivation, school climate, and online learning self-efficacy on online learning satisfaction. This study shows that online learning satisfaction depends on motivation, school climate, and self-efficacy. Therefore, educational institutions and educators should create an encouraging virtual learning environment to ensure students' satisfaction and overall achievement in online education.

Keywords: online learning satisfaction, motivation, school climate, online learning self-efficacy, partial least squares -structural equation modeling.

Abstrak: Kepuasan Pembelajaran Online di Perguruan Tinggi Filipina: Pemodelan Persamaan Struktural. *Institusi pendidikan tinggi Filipina telah memanfaatkan pembelajaran online untuk meningkatkan layanan pengajaran. Beberapa penelitian telah menunjukkan bahwa pembelajaran online sama efektifnya dengan model kelas tradisional. Namun, hanya sedikit penelitian yang mencoba menyelidiki kepuasan peserta didik dalam hal motivasi, iklim sekolah, dan efikasi diri pembelajaran online, yang memberikan perspektif berbeda dalam menilai pembelajaran online. Sebuah survei cross-sectional mengevaluasi 580 respon valid untuk mengatasi hal ini. Motivasi, iklim sekolah, dan efikasi diri pembelajaran daring memprediksi kepuasan pembelajaran online. Penelitian ini menguji lima jalur hipotetis menggunakan Partial Least Squares - Structural Equation Modeling. Hasil menyoroti dampak positif motivasi, iklim sekolah, dan efikasi diri pembelajaran online terhadap kepuasan pembelajaran online. Penelitian ini menunjukkan bahwa kepuasan pembelajaran daring bergantung pada motivasi, iklim sekolah, dan efikasi diri. Oleh karena itu, lembaga pendidikan dan pendidik harus menciptakan lingkungan pembelajaran virtual yang menarik untuk menjamin kepuasan siswa dan pencapaian keseluruhan dalam pembelajaran online.*

Kata kunci: *kepuasan pembelajaran online, motivasi, iklim sekolah, efikasi diri pembelajaran online, pemodelan persamaan struktural.*

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INTRODUCTION

Online learning, an essential feature of the development of education informatization, has drawn attention in education in recent years due to its various advantages of not being limited by time, location, or other variables. Traditional classroom instruction has been drastically replaced by online learning, where students complete their education at home in all countries, including the Philippines, to ensure continuity of learning. Online learning has been incorporated into almost all school sectors, making the trend of online learning in the advancement of global education unavoidable and irreversible. (Cen et al., 2020). Online learning is also known as e-learning, blended learning, virtual learning, remote learning, online learning, web-based learning, and online courses. (Singh & Thurman, 2019). Online learning can range from uploading learning materials to an online learning platform to live teaching and learning via various software applications that promote "the use of web-based technology to bridge the gap between the teacher and the student." (Singh & Thurman, 2019).

There are several advantages to online learning over traditional classroom-based learning. For example, it enables students to learn at their own pace, from anywhere and at any time. It also eliminates the need for physical travel, saving time and money and being environmentally friendly. Furthermore, online learning allows for personalized and adaptive learning, where the content and pace of instruction can be tailored to individual learners' needs and abilities. It also gives you access to a broader range of learning resources, such as multimedia materials and online libraries, which can enhance your learning experience. Despite its many benefits, online learning does have some drawbacks. For example, it necessitates a steady internet connection and access to appropriate devices, which may not be available to all students. It also requires self-motivation, self-discipline, and good time management skills, as students may face distractions and must balance learning with other obligations. Overall, online learning has become an important tool in education, particularly in light of the COVID-19 pandemic. Its effectiveness, however, depends on several factors, including the quality of the instructional design, the technology infrastructure, and the support provided to learners and educators.

As a result of this trend, more online learning platforms have been introduced to improve online learning. (Su and Chen, 2022). With the growing popularity of online learning, there has been an increase in online learning platforms providing a wide range of courses and educational resources. These platforms are intended to meet the needs of learners with a wide range of backgrounds, learning styles, and skill levels. The growing variety of online learning platforms has also created specialized platforms that cater to specific niches such as language learning, coding, or music. These platforms provide tailored courses and resources to assist learners in achieving their goals in these areas. Overall, the growing variety of online learning platforms democratizes education and makes it more accessible to a broader range of learners. It also gives students more flexibility and control over their learning experiences, allowing them to select the courses and resources that best suit their needs and interests. According to research, online learning can provide students with a variety of beneficial learning experiences (Li et al., 2017), and online learners have higher learner satisfaction than traditional face-to-face learners. (Morton et al., 2016; Dooley et al., 2018; Green et al., 2018; Riddle & Gier, 2019). Some research, however, suggests that online learning is less rewarding than in-person learning and that online learners are less engaged with online learning. (Pickering & Swinnerton, 2019). Ineffective course design and teaching methods in online education may lead to reduced student engagement and satisfaction, as Woodworth et

al. (2015) suggested. Due to varying opinions among scholars, it is crucial to conduct a thorough, systematic, and detailed investigation of online learning satisfaction (OLS). This is crucial for improving the quality of online courses and developing a more accurate evaluation system for online teaching quality. From this context, this study aimed to investigate the relationship between online learning satisfaction concerning motivation, school climate, and online learning self-efficacy. "The study focused on the perceptions of students in a developing country, specifically the Philippines, and investigated how their motivation, school climate, and online learning self-efficacy related to their satisfaction with online learning. The proposed model was discussed in terms of how these factors were interconnected and influenced students' overall satisfaction with online learning.

The remaining parts of the paper are structured into various sections. The second section covers the review of the relevant literature and the formation of hypotheses. The third section delves into the methodology used in the study, and the fourth section presents the results of the PLS-SEM analysis. In the fifth section, the findings are discussed, and their implications are highlighted. The sixth section concludes the paper, providing recommendations for future research.

Literature Review and Hypothesis Development

Motivation

Motivation is complex and unstable as human characteristics (Weiner, 2018: Keller, 2008). According to Gustiani (2020) & Ryan & Deci (2000), theorists have distinguished various types of motivation based on the interplay between needs and the environment. These include intrinsic motivation, which is the desire to engage in an activity for the sheer pleasure or satisfaction it brings; extrinsic motivation, which is the motivation to undertake an activity due to a sense of obligation or as a means to an end; and amotivation, which is the lack of drive or intent to pursue an activity due to a lack of appreciation for it, feelings of incompetence, or the belief that the desired outcome is unattainable. Motivation plays a crucial role in online learning environments as it improves student performance, affects their cognitive learning processes, and enables them to recognize rewarding or punishing outcomes. The significance of student motivation for success in online learning environments has been confirmed through research.

Additionally, motivation is a theoretical concept used to account for the initiation, direction, intensity, persistence, and quality of behavior, particularly goal-oriented behavior, as stated by Widjaja and Chen (2017). On the flip side, motivation impacts self-efficacy in online learning. A research study found that motivation positively correlates with learning self-efficacy, self-monitoring, and engagement. The study demonstrated that motivation directly influenced learning engagement and indirectly influenced learning self-efficacy and self-monitoring (Alemayehu & Chen, 2021). Another study discovered that students with high Internet self-efficacy performed better on the final exam and were more self-assured in completing an online course than those with low self-efficacy (Chang et al., 2014).

Furthermore, Prifti (2022) and Gunawardena et al. (2010) examined the factors influencing learner retention and satisfaction in online educational programs. They concluded that factors related to student characteristics, such as learner self-efficacy and motivation, have been shown to impact learning achievement and satisfaction. Thus, we hypothesized that:

H1: Motivation directly impacts online learning self-efficacy.
H2: Motivation directly impacts online learning satisfaction.

School Climate

The term "school climate" refers to the quality and nature of school life, which is based on students' experiences and reflects norms, goals, values, interpersonal relationships, teaching and learning practices, and organizational structures (Isaken & Ekvall, 2007; Sweetland; Hoy, 2000 and Kutsyuruba et al., 2015). Studies have attempted to identify the factors contributing to student satisfaction in online learning environments. Two studies by Kuo et al. (2013) and Kuo et al. (2014) examined some predictors of student satisfaction in online learning environments. They found that Internet self-efficacy, learner-instructor interaction, and learner-content interaction predicted student satisfaction, while learner-learner interaction and self-regulated learning did not. Bini & Masserini (2016) explored the relationship between school climate and student satisfaction and found that effective teaching positively impacts satisfaction and that students are less satisfied with their university studies when it is insufficient or perceived as such. Furthermore, Gray and DiLoreto's (2016) study showed that various factors, including course organization and structure, student engagement, learner interaction, and instructor presence, significantly influenced online learning environments' student satisfaction and perceived learning. Another study by Shea et al. (2002) and Gray, J & DiLoreto, M. (2016) focused on the effect of human social interaction on student satisfaction. They concluded that students who have more opportunities to receive feedback and interact with instructors are more satisfied with their online learning experiences, while those who have more opportunities to communicate and discuss with classmates report greater satisfaction. In light of the existing literature thus, the following hypotheses is proposed:

H3: School climate directly impacts online learning self-efficacy.

H4: School climate directly impacts online learning satisfaction.

Online learning self-efficacy

Peechapol et al. (2018) conducted a systematic review which found that various components, such as online learning experience and knowledge, feedback and rewards, online communication and interactions, social impact, and learner motivation and attitude, influence learner self-efficacy in online learning. Chang et al. (2014) explored the impact of Internet self-efficacy on learning outcomes. They found that high levels of Internet self-efficacy resulted in better performance on final exams and increased confidence in finishing an online course. Similarly, Zimmerman & Kulikowich (2016) found that self-efficacy can impact behavior and is crucial for online learning. Shen et al. (2013) discovered that online learning self-efficacy predicts student satisfaction, and task value and self-efficacy positively predict student satisfaction. However, Alqurashi (2016) notes that more research is needed to understand the significance of self-efficacy in online learning fully. Some studies have found a correlation between self-efficacy and student satisfaction, but others have not. Lin et al. (2013) found that older learners' sources of Internet self-efficacy were similar to those introduced by Bandura (1997), while Alqurashi (2016) and Bates & Khasawneh (2007) identified four factors that influence self-efficacy in online learning: previous success with online learning, pre-course training, instructor feedback, and online learning technology anxiety. Liaw & Huang (2013) found that perceived self-efficacy, anxiety, and interactive learning settings affect reported satisfaction. Bradley et al. (2017) revealed that self-efficacy and self-regulatory scores strongly correlate with academic achievement in traditional and online learning environments. With these, we hypothesized that:

H5: Online learning self-efficacy directly impacts online learning satisfaction.

Online learning satisfaction

During the pandemic, one crucial metric for academic success has been the level of satisfaction with online learning, which is the perception of contentment with online courses (Ke & Kwak, 2013). Adolescents who are more satisfied with their online education are more likely to feel empowered and use problem-based coping strategies, which can reduce the adverse effects of stress on their adjustment. Online learning satisfaction is significantly linked to dropout rates, persistence, motivation to take further online courses, student success, and student commitment to an online system or program (Kuo et al., 2014). Unlike traditional classes, online courses are perceived differently by students, and negative perceptions can result in poor learning outcomes, such as decreased motivation and persistence. Kauffman (2015) investigated several factors, such as learning outcomes, instructional design, and learner characteristics, that influence the online learning environment's performance and satisfaction for adult learners. Evaluating student satisfaction enables educational institutions to identify areas that need development and improvement in online learning (Kuo et al., 2014). Numerous studies have investigated the factors that affect student satisfaction in online learning environments in various countries, including the Philippines. Baloran and Hernan (2021) found that students are equally content with the quality of online learning delivery, but their levels of participation vary by year. The study also showed a strong correlation between online student participation and satisfaction with online courses. Additionally, structural equation modeling confirmed that student engagement in online learning, as measured by their abilities, emotions, participation, and performance, is highly correlated with their contentment with online courses. Casanova and Paguia (2022) discovered that there are very high levels of expectation, the scope of the learning experience, and satisfaction with the graduate school's online learning environment. These expectations, experience, and satisfaction are significantly positively related. The proposed structural model is shown in Figure 1.

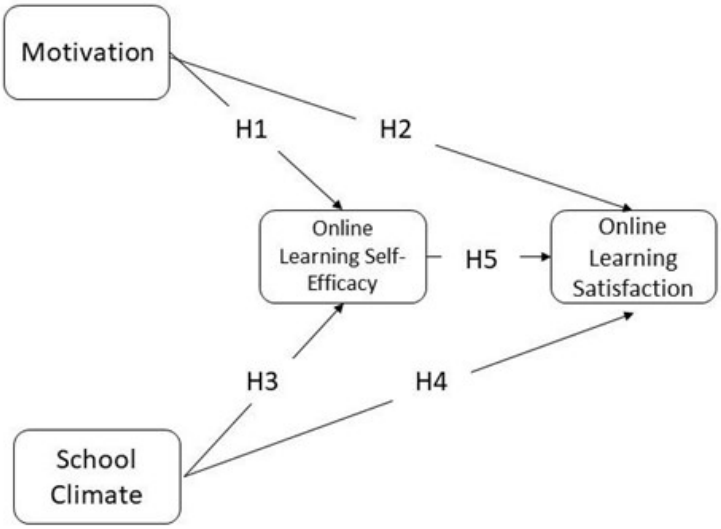

Figure 1. A proposed structural model of factors affecting online learning satisfaction

METHODS

Sampling and Data Collection

This study utilized previously developed measures for each construct, with motivation (M) having ten items, school climate (SC) having twelve, online learning self-efficacy (OLE) having eighteen, and online learning satisfaction (LS) having four (please refer to the Appendix). The data was collected through an online questionnaire distributed to approximately 700 target participants over six weeks, resulting in 580 responses. After removing 16 non-interactive responses, only 564 valid responses were used for the final analysis. These non-interactive responses were observed to have suspicious response patterns thus were eliminated from the analysis.

Development of Survey Instruments

This study obtained the necessary data using a modified survey questionnaire. The developed survey instrument used were based on the following: academic motivation scale, school climate measure, online learning self-efficacy, and online learning satisfaction, all verified by previous researchers. Also, these questionnaires were adopted from the following researchers and were divided into four parts:

First, the college version of the Academic Motivation Scale by Vallerand et al. (1993) was adopted and modified to assess students' academic motivation. A high rating on a subscale denotes strong support for that specific academic motivation. The items are measured along a five-point scale from "strongly agree" (5) to "strongly disagree" (1). Ten items were used and Cronbach's alpha for the scale was 0.881.

Second, the School Climate Measure developed by Zullig et al.'s (2010) was adopted to measure students' perceptions of school climate. Sample items are the following: 'Teachers understand my problems' 'Teachers are available when I need to talk with them' 'Teachers at my school help us children with our problems'. The items are measured along a five-point scale from "strongly agree" (5) to "strongly disagree" (1). Twelve items were used and Cronbach's alpha for the scale was 0.917.

Third, Sun and Rogers (2020) have created an online learning self-efficacy (OLE) instrument designed specifically for the online learning setting. The purpose of using OLE in this study is to determine students' learning requirements, as shown by their online learning self-efficacy beliefs. Sample items are the following: 'I feel confident in downloading and installing a software or application from a website' 'I feel confident in printing a websites' 'I feel confident in accessing links to web resources.' 'I can gain a sense of belonging in my online courses by getting to know other course participants'. The items are measured along a five-point scale from "strongly agree" (5) to "strongly disagree" (1). Eighteen items were used and Cronbach's alpha for the scale was 0.946.

In addition, a learning satisfaction instrument called Online Learning Satisfaction (LS) by Lin (2005) was tailored for the online learning environment was adopted in the study. Sample items are 'I developed knowledge and competencies in this course' 'The course activities were a good fit for the way I like to learn' 'The course activities met my expectations for what I had hoped to learn' 'The knowledge and competencies taught through the course activities are personally meaningful and important to me'. The items are measured along a five-point scale from "strongly agree" (5) to "strongly disagree" (1). There were four items and Cronbach's alpha for the scale was 0.927.

Participants

A total of 580 students from different Philippine higher education institutions in the Central Visayas Region volunteered to complete

the survey. Respondents signed an informed consent form for voluntary participation and strict nondisclosure of information to unwarranted parties. Data in this study was collected through online survey instrumentation and distributed to targeted student respondents.

Table 1. Profile of the respondents

Category	n	%
Age (in years)		
15-20	381	65.69
21-25	187	32.25
26-30	9	1.55
31-35	2	0.34
36-40	1	0.17
Gender		
Male	82	14.14
Female	473	81.55
LGBTQIA+	25	43.1
Province in Region 7		
Cebu	335	57.76
Negros	70	12.07
Bohol	90	15.52
Siquijor	85	14.66
Gadgets Used		
cellphone	559	96.3
laptop	148	25.5
personal computer	14	2.4
Connectivity Status		
Very weak	21	3.62
Weak	263	43.35
Strong	292	50.35
Very Strong	4	0.69
Online Platform used		
Google Classroom	580	100
Moodle	171	29.48
Canva	192	33.1
Google Meet	25	4.31
Microsoft Teams	84	14.48
Blackboard	5	0.86
Zoom	3	0.52
Edmodo	14	2.41
Odilo	3	0.52

Table 1 shows that approximately 81.55 % of the respondents (n = 473) were female, while only 14.14% % were male (n=58), and 4.31 % were from the LGBTQ+ community (n = 25). With a frequency of 381, students aged 15 to 20 had the highest number of respondents. They were followed by students aged 21 to 25, with a frequency of 187. It should be noted that the link to the study instrument was sent via social media and was directed to a Google form. Although all genders use the internet and social media equally, the low turnout of male and LGBTQ+ students was due to their lower population than female students. While more students aged 20 and under participated in the study than those aged 21 and up, this supports Labucay's (2011) study that age is a strong predictor of internet use, with younger generations being more internet users and decreasing with age. Also presented on the table, students used various gadgets to avail the online facility. Mobile (96.38%) was the most common, followed by laptops (25.52%) and personal computers (2.41%). A very high turnout of mobile or smart cellphone users shows that we live in a world where they are widely available, easy to use, and found in almost every household. There will be a smartphone whether or not there is a laptop, tablet, or desktop computer. The smartphone, commonplace in households of all demographics, provides a portable platform as a powerful learning aid (Fuller et al., 2022). Moreover, most respondents (50.35%) have a strong connectivity status, followed by 45.35% with weak connectivity, 3.62% have a problem with connections with a very weak status, and only a few have a very strong connection (0.69%). Salac and Kim (2016) state that when comparing the present state of global information and communication technology (ICT) with the Philippines, the Philippines' Internet infrastructure lags behind other developing countries in Asia, specifically regarding Internet connectivity. For instance, in 2015, the average Internet speed in Thailand was 7.4 Mbps, Sri Lanka 7.4 Mbps, and Malaysia 4.3 Mbps. In contrast, the Philippines had a low average Internet speed of 2.8 Mbps, ranking 104 out of 160 countries, with countries like South Korea (23.6 Mbps) and Singapore (12.9 Mbps) ranking first and second, respectively. The researchers also revealed that the lack of competition in the Internet connectivity market is the underlying cause of slow and costly Internet connections.

■ RESULTS AND DISCUSSION

This research employed a statistical technique known as partial least squares structural equation modeling (PLS-SEM) to determine the cause-and-effect relationships between the variables under investigation. PLS-SEM is a practical approach for analyzing correlations between variables, even in cases of non-normality. The collected data were entered into Smart PLS software to verify the internal consistency of the items in each section. The software was used to estimate the structural model's parameters and evaluate the measurement model's psychometric properties. All survey questions required a mandatory response to ensure all responses were complete and contained all the necessary information. Additionally, any suspicious response patterns were eliminated from the analysis.

Measurement Model Assessment

The PLS analysis allows the outer measurement and inner structural models to be tested in parallel, as well as reflective and formative latent variables. (Fornell & Bookstein, 1982). The first criterion in evaluating the proposed model is to assess the reliability and validity of the measures (Hair et al., 2017). As shown in Table 2, all indicators were convergent and reliable based on the measurement model assessment results. However, factor loadings less

than 0.7 but greater than 0.60 were acceptable (Henseler et al., 2009). (Vinzi et al., 2010). Six item indicators (M4, M7, SC1, OLE1, OLE2, OLE6) were removed after the SmartPLS algorithm calculated until all item indicators reached the 0.60 threshold. For the final analysis, there were 38 measurement indicators left. Each construct's measures were all valid. All constructs have appropriate convergent validity with AVE statistics greater than the threshold value of 0.5 (Fornell & Larcker, 1981), ranging from 0.509 to 0.813. Furthermore, all of the constructs scored above Cronbach's alpha (α) threshold value of 0.60, which is considered acceptable reliability and an acceptable index (Nunnally, 1994; Ursachi et al., 2015), and composite reliability (CR) threshold value of 0.70. (Hair et al., 2017). Cronbach's alpha values range from 0.905 to 0.942, and CR values range from 0.905 to 0.944. These findings point to high levels of reliability. Table 2 summarizes the measurement model results.

Table 2. Measurement model assessment results

Items	Loadings	AVE	Cronbach α	CR	Items	Loadings	AVE	Cronbach α	CR
M1	0.725	0.688	0.934	0.942	LS1	0.888	0.813	0.923	0.924
M2	0.854				LS2	0.908			
M3	0.865				LS3	0.904			
M5	0.835				LS4	0.907			
M6	0.736				OLE3	0.671	0.554	0.942	0.94
M8	0.845				OLE4	0.662			
M9	0.881				OLE5	0.668			
M10	0.877				OLE7	0.688			
SC2	0.69	0.509	0.905	0.905	OLE8	0.707			
SC3	0.742				OLE9	0.729			
SC4	0.758				OLE10	0.786			
SC5	0.684				OLE11	0.822			
SC6	0.754				OLE12	0.827			
SC7	0.737				OLE13	0.822			
SC8	0.698				OLE14	0.628			
SC9	0.668				OLE15	0.778			
SC10	0.717				OLE16	0.807			
SC11	0.748				OLE17	0.747			
SC12	0.64				OLE18	0.786			

Note: α = Cronbach's alpha; CR= composite reliability; AVE= average variance extracted; LS= online learning satisfaction; M=Motivation; SC= School climate; OLE=Online learning self-efficacy

The study examined the correlations of potential overlapping variables to evaluate the distinctiveness of the measurement items among constructs (Hair et al., 2014). Discriminant validity was ensured by calculating the square root of the average variance extracted (AVE), which was greater than the squared correlation of each latent variable, as Fornell and Larcker (1981) recommended. The square roots of the AVE are bolded in Table 3, while the non-bolded values

represent the intercorrelation between constructs. All off-diagonal values are less than the square roots of AVE, indicating that the condition suggested by Fornell and Larcker is satisfied. In summary, the reliability and validity of the measurement model were satisfactory, with all items being valid and suitable for estimating parameters in the structural model.

Table 3. Fornell and larcker results

	LS	M	OLE	SC
LS	**0.829**			
M	0.428	**0.902**		
OLE	0.4	0.624	**0.745**	
SC	0.441	0.583	0.569	**0.713**

The model's fitness was deemed acceptable with a Standardized Root Mean Square Residual (SRMR) value of 0.064, a commonly accepted fit value of 0.08. The Normed Fit Index (NFI) value, which ranges from 0 to 1, was 0.792, indicating a moderately acceptable value, with the threshold for acceptable fit being less than 0.90. A higher NFI value closer 1 suggests a better fit.

Structural Model

To evaluate the effect of independent variables on the dependent variable, a structural model is used, which is assessed based on three factors: path coefficients, R^2 values (prediction power), and f2 (effect size) (Hair et al., 2017). In this study, using PLS-SEM, the path coefficients of the structural model indicate that all five hypotheses (H1, H2, H3, H4, H5) are supported, as shown in Table 4 and Figure 2. The strength of prediction accuracy is determined by acceptable values of 0.75, 0.50, and 0.25, which correspond to significant, moderate, and modest levels, respectively (Henseler et al., 2009). The coefficient of determination (R^2) measures the predictive accuracy of the structural model. In this study, LS has the highest variance (0.481 or 48.1%), followed by OLE with a value of 0.351 (35.1%). The R^2 criterion is met, indicating a moderately high level of predictive ability of the structural model.

Table 4. Path coefficient results

	β	t-value	p-value	Decision
M -> OLE	0.185	4.664	0.000***	Supported
M -> LS	0.138	3.293	0.001**	Supported
SC -> OLE	0.487	12.226	0.000***	Supported
SC -> LS	0.294	6.376	0.000***	Supported
OLE -> LS	0.402	9.654	0.000***	Supported
Note: ***$p<0.001$, **$p<0.01$				

The SmartPLS algorithm was utilized to estimate the effect sizes (f^2) of the links between the exogenous and endogenous constructs, indicative of minor, medium, or substantial effects (Hair et al., 2017). The f^2 values of 0.02, 0.15, and 0.35 correspond to minor, medium, and substantial effects. When the value is less than 0.02, the exogenous constructs do not affect the endogenous constructs. The study found that the SC construct has a substantial effect on OLE (f^2=0.295), while OLE has a substantial effect on LS (f^2=0.202). Additionally, SC has a medium effect on LS (f^2=0.103). These findings are presented in Table 5.

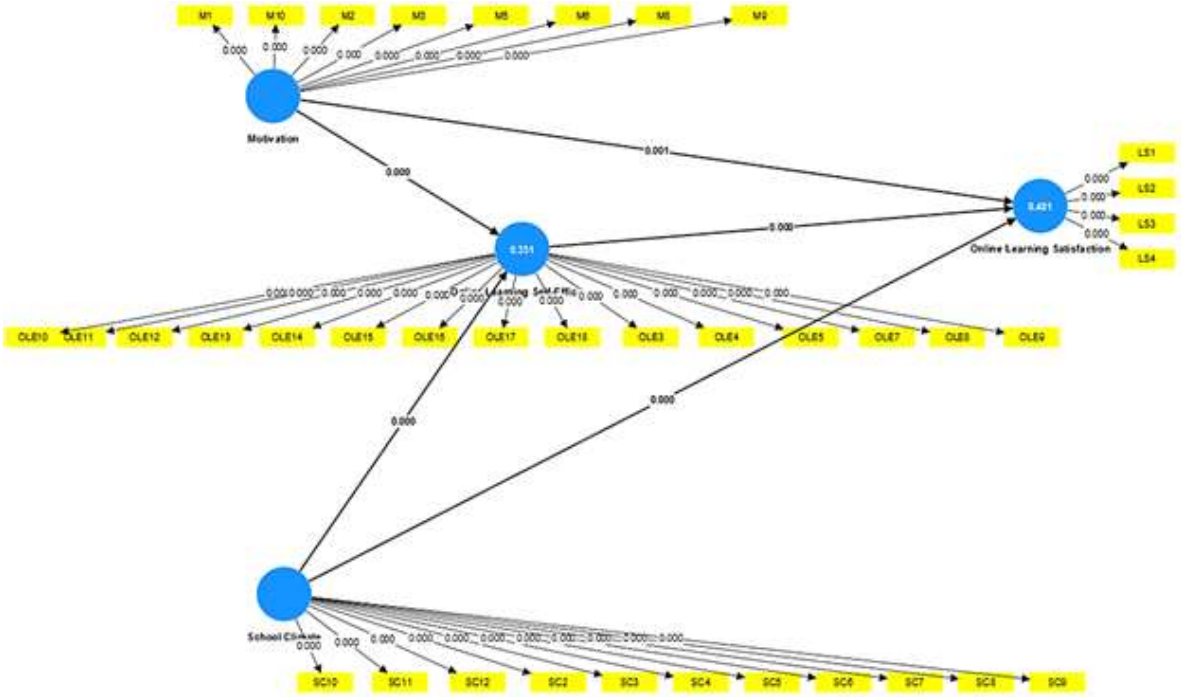

Figure 2. The final result

Table 5. Effect size results

	M	LS	OLE	SC
M		0.028	0.042	
LS				
OLE		0.202		
SC		0.103	0.295	

The structural model's outcomes indicated that the satisfaction of online learning is positively influenced by the learner's motivation (H2), school climate (H4), and online learning self-efficacy (H5) directly. Learners' motivation (H1) and school climate (H3) also affect online learning self-efficacy.

Motivation, school climate, and self-efficacy are important factors that can influence learners' online learning satisfaction. The study's findings confirm that motivation is critical to learners' satisfaction with online learning (H2). Students motivated to learn online tend to be more engaged and committed to learning. On one hand, highly motivated learners tend to report higher levels of satisfaction with online learning. Motivation can come from various sources, including interest in the subject matter and learning, receiving rewards or recognition, or the desire to connect with others in the learning community. On the other hand, Learners' motivation affects online learning self-efficacy (H1). Motivated learners tend to have higher levels of self-efficacy, believing in their capabilities to perform well in online courses. For example, Bouchard & Héon (2021) the impact of learners' motivation on their self-efficacy in an online learning context. The findings revealed that students with higher motivation demonstrated greater self-efficacy in managing their online learning tasks and persisting through challenges.

Moreover, a positive school climate can enhance learners' online learning satisfaction (H4) by providing a sense of belonging, safety, and support. Learners with a favorable impression of their school climate are more likely to be content with their online learning experience. A positive school environment can be created by encouraging positive interactions between students and teachers, creating opportunities for socializing, and offering appropriate resources and support. Additionally, school climate, even in an online setting, can significantly influence students' online learning self-efficacy (H3). A positive school climate that fosters support, collaboration, and engagement can enhance students' confidence in their abilities to succeed in online courses. Wang, Zhang, and Gao (2019) found that students who perceived a positive school climate in their virtual classrooms reported higher levels of self-efficacy in managing their online studies.

Lastly, learners with high levels of self-efficacy tend to have greater confidence and perseverance in their learning, which can result in increased satisfaction with online learning (H5). Learners with low self-efficacy may feel overwhelmed and discouraged, negatively impacting their satisfaction with online learning. Teachers can help learners develop self-efficacy by providing positive feedback, setting achievable goals, and offering support and guidance when needed. Teachers and schools can promote these factors by creating a positive learning environment, offering support and guidance, and helping learners develop confidence and motivation.

■ CONCLUSIONS

Based on the findings, motivation, school climate, and online learning self-efficacy influence students' online satisfaction. If students are motivated, they may feel satisfied. The findings support (Jan, 2015; Rodriguez et al., 2008), who found that satisfaction is related to motivation, and comfort is related to interest in learning technology skills in students without experience with online learning. Moreover, creating a supportive learning environment where learners feel comfortable asking questions and seeking help is essential. This can be achieved by providing regular feedback, responding to queries promptly, and creating opportunities for one-on-one interactions. Online courses should include interactive learning activities that engage the learners. This can be through discussions, group assignments, quizzes, and other activities that encourage learners to participate actively in the learning process. Learning materials should be easily accessible and well-organized. This includes providing clear instructions on accessing course materials and ensuring they are available in various formats catering to different learning styles. Lastly, personalizing the learning experience can also improve satisfaction. Learners should customize their learning experience based on their interests and needs. This can include providing different paths to complete the course, offering additional resources, or providing personalized feedback. Costan (2022) suggested that to achieve successful online teaching. Teachers should undergo capability training. The training should focus on developing the ability to create interactive remote materials, design asynchronous activities, and implement game-based learning platforms.

■ ETHICAL CONSIDERATION

This research followed the National Ethical Guidelines for research with human subjects in 2017 and the Data Privacy Act of 2012. Volunteer respondents read and signed an informed consent form for voluntary participation and strict nondisclosure of information to unwarranted parties. The informed consent will ensure that there is no grave, foreseeable personal risk on the part of the respondents.

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