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Modelling Online Learning Satisfaction of Secondary School Students in Indonesia: The Role of Family and School Support

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ABSTRACT

Fully distance learning has been implemented for more than two years in Indonesian secondary schools during and after the pandemic lockdown. The implementation of fully online learning is abrupt to most students and teachers, and little is known about what factors affect secondary students' satisfaction with online learning. Thus, this study intended to analyse factors influencing online learning satisfaction of high school students in Indonesia. An online survey was carried out, and 293 students filled out the Google Form questionnaire. Data analysis implemented the Partial Least Squares-Structural Equation Modelling (PLS-SEM) method. The findings indicate that family support, student-material interaction (SMI), and school support are significant influencers of online learning satisfaction. Meanwhile, teacher performance (TPP) and ICT self-efficacy (ISE) had no significant effects on learner satisfaction. However, both TPP and ISE significantly affected the SMI variable. These findings suggest that when schools and families give sufficient support to students, their satisfaction with online learning rises, resulting in better student learning engagement and outcomes. The study's findings can provide a direction for stakeholders in high schools to better implement fully online learning.

1. INTRODUCTION

Since early 2020, the world and human activities changed drastically after COVID-19. This situation has brought impacts on various sectors, including education. One of the impacts on education is in the way the learning process is conducted, implementing full distance learning based on regulations issued by various governments, including Indonesia. For this reason, the utilisation of information and communication technologies (ICT), such as e-learning platforms, smartphones, and the Internet, is applied to support online (distance) learning. The transition from conventional offline to fully online learning for educational

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institutions was challenging for both learners and teachers, most of whom were not familiar with it (Henriksen et al., 2020). This condition forced several researchers all over the world to analyse the learning experiences of students at all levels (Abubakari & Mashoedah, 2021), including secondary education.

For online learning to be effective, it is highly dependent on how teachers design the learning to suit the subjects being taught by analysing what can be done online or traditionally (Ni, 2013). Studies by Liu and Hwang (2010) and Tarhini et al. (2013) show that the use of e-learning in the teaching and learning process is also useful in presenting interesting learning content so that students are satisfied with the learning process. A study by Soffer and Nachmias (2018), uncovered that online learning has a significant impact on the ability to understand course structure and to develop good communication skills, the chance to access more learning materials, higher satisfaction and interaction, and better learning content in comparison to offline learning. Additionally, online learning satisfaction also needs to be considered from the student's point of view so that it will be successfully implemented (Van Wart, Ni, Medina, et al., 2020), as previous research works (A. Ali & Ahmad, 2011; Hsieh Chang & Smith, 2008; Van Wart, Ni, Ready, et al., 2020) suggest that student learning satisfaction significantly impacts the success of online learning.

The abrupt change from conventional offline to online learning has substantial impacts on students' mental and learning difficulties, such as feeling uncomfortable, unfocused, confused, frustrated and less interested in learning (Baloran, 2020; Serhan, 2020). As the pandemic occurred, students began to learn from home through online classes, and it has been affecting student learning patterns; this has made learners' families and schools influential in supporting the teaching and learning process when learning is carried out online (Permatasari et al., 2021; Solihah et al., 2023). Several studies were done to predict probable variables of student learning satisfaction during distance learning, and those factors are student interaction with teachers (A. Ali & Ahmad, 2011; Sher, 2009), interaction with learning content and online learning self-efficacy (Alqurashi, 2017, 2019; Shen et al., 2013), to mention a few. Further, previous academics (Amoozegar et al., 2017; Appleton et al., 2008) argue that school support is crucial in facilitating learner engagement. Nevertheless, a review of the literature and recent studies suggest that there are scarce investigations on school students' online learning satisfaction and the factors affecting it, especially in the Indonesian context (Abubakari et al., 2022; Solihah et al., 2023).

Therefore, the present researchers planned to investigate the relationship between several factors such as teacher performance (TPP), student material Interaction (SMI), ICT self-efficacy (ISE), school support (SS) and family support (FS) in predicting online learner satisfaction (LS). The addition of the SS and FS variables in this current study, which are missing in previous studies, needs to be done, considering that young students have difficulties in the implementation of distance learning from their homes.

2. RESEARCH MODEL AND HYPOTHESES FORMULATION

The research model of online learning satisfaction (MOLS) is portrayed in Fig. 1, where each arrow represents the association between research variables, hence the study hypotheses (H). The next sections provide the theoretical description of the involved research variables in the proposed MOLS.

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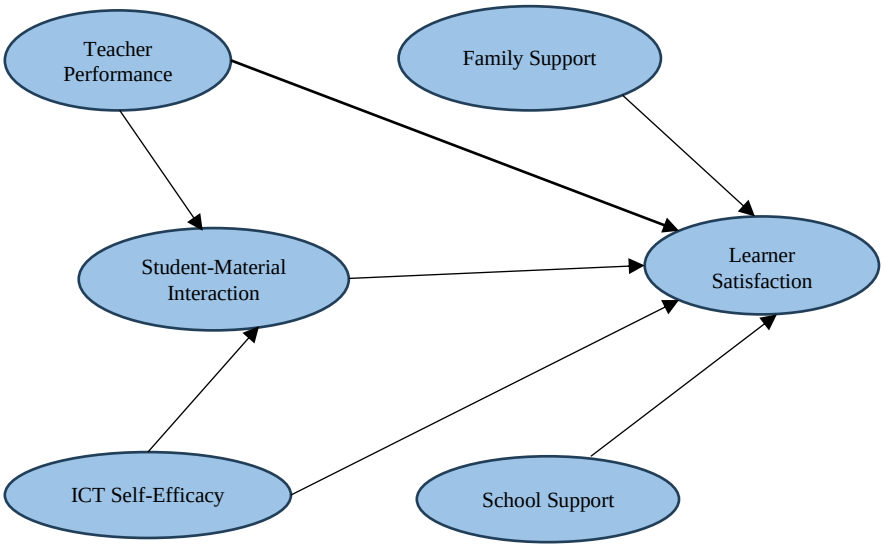

Fig 1. Research Conceptual Model.

Source: Authors' creation, adapted from Bervell et al. (2020)

2.1 School and Family Support on Learner Satisfaction

Recently, studies from Gil et al. (2021) and Permatasari et al. (2021) have shown interest in investigating the effects of family support on young learners' satisfaction. Some researchers (Alnabhan et al., 2001) observed that a lack of family support resulted in poor student achievement. It can be assumed that family support is important in learners' satisfaction. Students need family aid because coping with academic demands will be a lot easier with the help of social support. Previous research by Pinkerton and Dolan (2007) also showed students frequently seek support within their families, especially when coping with academic challenges and stress (Stecker, 2004). Students with family support also showed more confidence in dealing with challenges related to academic demands (Klink et al., 2008).

Studies by Muljana and Luo (2019) and Rotar (2020) acknowledged that in order to ensure learner engagement, motivation, and success in online learning settings, as well as to overcome learning challenges, student support is essential. School support in online environments is of crucial significance (Lili & Jian-Hao, 2023), especially for young learners. A study by Baker et al. (2003) proposed that schools provide a psychologically healthy environment when they provide support for students. The study categorised school support as (1) enhancing the students' interaction to create a sense of belongingness, (2) improving students' competency, and (3) promoting a sense of autonomy through self-regulated learning. All of these factors are related to the positive learners' attitudes and behaviours (Fabriz et al., 2021). Thus, school support from administrators, teachers, and classmates is associated with learner satisfaction with online learning. Eventually, both school and family support are hypothesised to have positive effects on students' learning outcomes as follows.

H1: Family support significantly influences online learner satisfaction.
H2: School support substantially affects online learner satisfaction.

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2.2 ICT Self-Efficacy, Student-Material Interaction, and Learner Satisfaction

ICT self-efficacy refers to the capability of learners to execute and perform internet-based tasks or assignments using different ICT tools (Eastin & LaRose, 2006; Kuo, 2014). ICT self-efficacy is positively affected by past Internet and other technological experiences. Researchers (Torkzadeh et al., 2006) found that individuals with positive behaviours toward technology development are likely to have higher ICT self-efficacy. Lerners' perception of their learning experiences and material interaction become critical indicators of learner satisfaction (Kuo, Walker, Belland, et al., 2014). Learners' satisfaction in online settings is associated with the cognitive learning outcomes derived from student-material interaction, which highly depends on the ICT self-efficacy of an individual. Some previous studies (Kuo, 2014; Kuo, Walker, Belland, et al., 2014) reported a positive association between ICT self-efficacy, student-material interaction and learner performance in the online learning environment. Literature (Tsai & Tsai, 2003) showed that learners with optimal ICT self-efficacy possess excellent information-browsing abilities and have better interaction with course materials. Other studies (Alqurashi, 2017, 2019) also reported ICT self-efficacy is likely to improve learners' satisfaction.

Among the essential variables that affect the learner's satisfaction in online learning settings are interactions (Kuo et al., 2014). Student-material interaction is considered an important element in online learning environments since this factor contributes to course completion and enhances learning outcomes (Zimmerman, 2012). Interaction with effective learning content can change students' perspectives and understandings (Lou et al., 2006). E-learning content includes any teaching files, audio or video that are used to deliver the topics, such as PowerPoint, reports, charts and graphs, e-books, and journals, among others. The effectiveness of material interaction is influenced by the quality of the internet and the electronic system being used. Typically, using media and technology may enhance the impact of pedagogy (Lou et al., 2006). A teacher-student relationship may be enhanced by innovative technology advances, such as tailored feedback based on learning analytics (Pardo et al., 2019).

Students' satisfaction is shown in a short-term mindset coming from their self-assessment based on learning experiences (Weerasinghe et al., 2017). To achieve students' satisfaction, the learning materials should be designed well, and compatibility issues with available technologies should be considered (Agung & Surtikanti, 2020; Murray et al., 2012). Among the key factors in enhancing digital-based learning is the employment of multimedia-enhanced materials (Liaw, 2008). Thus, interactions between learners and e-learning materials are needed to develop a sense of engagement between students and materials to achieve students' satisfaction with distance learning.

H3: ICT self-efficacy significantly affects student-material interaction.
H4: ICT self-efficacy significantly influences online students' satisfaction.
H5: Student-material interaction substantially affects online students' satisfaction.

2.3 Teacher Performance, Student-Material Interaction, and Learner Satisfaction

In the teaching-learning processes, teachers are expected to establish a good learning environment by providing a well-designed student-material interaction to elicit students' motivation (Vermeulen & Schmidt, 2008) and hence reach learner satisfaction. Teacher performances are related to the arranged and systemic activities measured by the students' satisfaction based on the requirements for teaching quality (Ko & Chung, 2014). In addition, compassion, availability, and well-made presentations are the most important factors that determine teacher performance quality (Dewar, 2002).

The interrelation of student-material interaction (SMI), learner satisfaction (LS), and teacher performance (TPP) illustrates how a teacher performs in creating a good learning environment by using technologies to create engaging student-material interaction that contributes to learner satisfaction (Zimmerman, 2012). Student-material interaction happens when learners access and engage with the learning materials available (Kuo, Walker, Schroder, et al., 2014), where learners think deeply and process

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the information and concepts derived from learning experiences. Student-material interaction is important in correlation with teachers-to-students and students-to-student interactions (Bervell et al., 2020). This interaction also enables learners to compile and formulate the learning contents cognitively and, at the same time, integrate the knowledge into the existing learning experiences (Moore, 1989). The factors of SMI and TPP highly affect students' satisfaction with online learning processes (Hsieh Chang & Smith, 2008). Thus, positive experiences with materials and instructors in online learning environments have positive effects on learner satisfaction.

H6: Teacher performance significantly influences student-material interaction.
H7: Teacher performance significantly affects online learner satisfaction.

3. METHODOLOGY

3.1 Context and Research Design

The study is quantitative research based on an online survey that involved high school students from three Indonesian provinces, namely Yogyakarta, Banten, and West Java, comprising six high schools. A total of 293 students filled out an online questionnaire in March 2021 during fully online learning (studying from home through different online platforms such as Google Classroom, WhatsApp, Google Meet, Zoom, and others) due to school closures caused by the COVID-19 pandemic. The majority of respondents were from Yogyakarta (119), followed by Banten (91), and from West Java (83). The age of students ranged from 12 to 18 years old, and the majority were from junior high schools (229), while the rest were senior high school students (64). Furthermore, 184 respondents were females, and 109 were males.

3.2 Instrumentation

The items of the research instrument were adapted from several previous studies (Al-Busaidi & Al-Shihi, 2012; A. Ali & Ahmad, 2011; Amoozegar et al., 2017; Appleton et al., 2006; Cho et al., 2017; Kuo, Walker, Schroder, et al., 2014; Lee, 2010; Sher, 2009). All items were scaled on a 5-Likert scale (From 1 representing a Strongly Disagree to 5 representing a Strongly Agree). Except for the Teacher performance variable (with six items), all other variables had four items each, making 26 research items in total.

3.3 Data Collection and Methods of Analysis

The research questionnaire implemented the Google Form and then distributed it to teachers, who then shared it with their students through WhatsApp. The study used a snowballing technique for data collection since the participants were at their homes and hard to access due to the current pandemic protocols. The study utilised IBM-SPSS V.25.0 software for demographic data analysis and testing instrument reliability. Additionally, partial least squares-structural equation modelling (PLS-SEM) was analysed through Smart-PLS V.3.3.3 (Ringle et al., 2015). Regarding the instrument reliability test, a pilot study used 35 samples and found a value greater than the allowed threshold of 0.7 (Cronbach's alpha score of 0.959) (Cronbach, 1951).

4. ANALYSIS RESULTS

4.1 Measurement Model Analysis

The model was analysed for constructs' internal consistency and convergent validity based on measures of composite reliability (CR), Cronbach's Alpha (α), factor loadings (FL), and average variance extracted (AVE). α is a widely used measure of internal consistency reliability. While CR is preferred in factor analysis, α is still reported as it provides a quick estimate of the average inter-item correlation. Still, it might underestimate reliability if the FL are low or unequal. CR is a measure of internal consistency

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reliability and represents the extent to which the items in a factor consistently measure the underlying construct. It is an improvement over α, especially in the context of factor analysis, as it considers the factor loadings of items. FL represent the strength and direction of the relationship between each observed variable and the underlying factor. A high FL (close to 1) suggests that the variable is a good indicator of the latent construct. Low FL may indicate that the variable is not contributing much to the factor. AVE assesses the amount of variance captured by the latent factor relative to the amount of variance due to measurement error. Higher AVE values (above 0.50) indicate that a substantial proportion of the variance in the observed variables is explained by the underlying construct, supporting the convergent validity of the measurement model.

Moreover, the Heterotrait-Monotrait Ratio (HTMT) and Fornell-Larcker criterion (FLC) criteria were used to check each construct's discriminant validity. Discriminant validity is crucial to determine if each factor is distinct from one another regarding what they measure (Hair et al., 2019). Regarding the FLC, the AVE square root value of the construct should be higher than that of the correlations with other constructs (Henseler et al., 2017). Table 1 demonstrates the score of AVE, CR, α, and FL results. From Table 1, the measurement model was justified as valid and reliable since all the criteria have been met. The values of factor loadings (except an item TPP5 was not above the threshold and hence excluded from the table) are above the acceptable coefficient of 0.708 (Henseler et al., 2017), while the CR and α values are all above 0.7, a minimum required score (Henseler et al., 2017). Further, the AVE values are beyond 0.5, meaning that the test of convergent validity was satisfied (Hair et al., 2019). Furthermore, the results of the discriminant validity test satisfied the criteria of FLC and HTMT (Hair Jr et al., 2022).

Table 1. Results of reliability and convergent validity

Construct	α	CR	AVE	FL	Items
Family Support (FS)	0.807	0.873	0.632	0.808	FS1
				0.770	FS2
				0.834	FS3
				0.766	FS4
ICT Self-Efficacy (ISE)	0.825	0.884	0.655	0.808	ISE1
				0.843	ISE2
				0.774	ISE3
				0.811	ISE4
Learner Satisfaction (LS)	0.866	0.909	0.713	0.857	LS1
				0.844	LS2
				0.866	LS3
				0.811	LS4
Student-Material Interaction (SMI)	0.842	0.894	0.679	0.784	SMI1
				0.798	SMI2
				0.866	SMI3
				0.845	SMI4
School Support (SS)	0.869	0.911	0.718	0.857	SS1
				0.879	SS2
				0.866	SS3
				0.785	SS4
Teacher Performance (TPP)	0.790	0.856	0.543	0.726	TPP1
				0.718	TPP2
				0.715	TPP3
				0.767	TPP4
				0.756	TPP6

Source: Authors' analysis results.

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Moreover, Table 2 depicts the HTMT (scores in brackets and italicised) and FLC results. According to Table 2, the results support every HTMT and FLC criterion. When it comes to the HTMT criteria, since the highest HTMT value in the table is 0.844, all values are below the rigorous cut-off of the 0.855 coefficient (Henseler et al., 2016, 2017). Moreover, FLC was satisfied since each construct's AVE square root values (bolded) are higher than the cross-correlation values with other constructs (Fornell & Larcker, 1981).

Table 2. Results of FLC and HTMT ratio

Construct	FS	ISE	LS	SS	SMI	TPP
Family Support (FS)	**0.794** *(0)*					
ICT Self-Efficacy (ISE)	0.479 *(0.585)*	**0.809** *(0)*				
Learner Satisfaction (LS)	0.616 *(0.724)*	0.563 *(0.652)*	**0.844** *(0)*			
School Support (SS)	0.625 *(0.743)*	0.592 *(0.695)*	0.666 *(0.757)*	**0.847** (0)		
Student-Material Interaction (SMI)	0.549 *(0.657)*	0.581 *(0.690)*	0.724 *(0.844)*	0.596 *(0.690)*	**0.824** *(0)*	
Teacher Performance (TPP)	0.575 *(0.704)*	0.517 *(0.641)*	0.551 *(0.655)*	0.635 *(0.767)*	0.564 *(0.676)*	**0.737** *(0)*

Source: Authors' analysis results.

4.2 Structural Model Analysis

The predictive relevancy (Q^2), path coefficients significance, and determination factor (R square, R^2) were used to assess the structural model (Hair et al., 2019). The Q^2 coefficient indicates if independent variables are significant for predicting a particular dependent variable within a model. Weak, moderate, and strong are the classifications assigned to Q^2 for 0.02, 0.15, and 0.35, respectively. Moreover, the R^2 coefficient informs how influential the independent variables are in explaining the variance of a particular dependent variable. High, medium, and low are indicated by the R^2 values of 0.70, 0.50, and 0.25, respectively. (Hair Jr et al., 2017). The Q^2 and R^2 scores for dependent SMI and LS variables are portrayed in Table 3.

Table 3. Results of Q^2 and R^2 values for dependent constructs

Construct	Q^2	R-Square (R^2)
Family Support		
ICT Self-Efficacy		
Learner Satisfaction	**0.441**	**0.634**
School Support		
Student-Material Interaction	**0.285**	**0.433**
Teacher Performance		

Source: Authors' analysis results.

Table 3 shows that the values of R^2 are 0.634 (for learner satisfaction) and 0.433 (for student material interaction). These results imply that independent constructs explained 63.4% of the variance to the online Learner Satisfaction construct. The value of 0.634 of the R^2 is relatively high (Hair Jr et al., 2017). Additionally, Q^2 values of 0.441 and 0. 0.285 show that the study model's predictive capacity is sufficiently relevant (Hair Jr et al., 2017). Lastly, the path coefficient and respective significance level values are shown in Table 4.

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Results from Table 4 indicate that five paths (out of seven) have significant values (in bold) as their significance levels are below 0.05. These paths are FS ->LS (T = 3.539, *P* <0.001), ISE ->SMI (T = 6.533, *P*< 0.001), SS ->LS (T = 3.198, *P*< 0.01), SMI ->LS (T = 6.640, *P*< 0.001), and TPP ->SMI (T = 6.326, *P*< 0.001). The other two paths were insignificant based on their significance levels. Thus, five hypotheses (H6, H5, H3, H2, and H1) were satisfied, while two hypotheses (H4 and H7) were rejected.

Table 4. Results of path effects values and respective significance level

Path	Original Sample (O)	Standard Deviation (STDEV)	T-Statistics (|O/STDEV|)	P-Values
FS -> LS	0.188	0.053	**3.539**	**0.000**
ISE -> LS	0.076	0.051	1.479	0.139
ISE -> SMI	0.395	0.060	**6.533**	**0.000**
SS -> LS	0.245	0.077	**3.198**	**0.001**
SMI -> LS	0.426	0.064	**6.640**	**0.000**
TPP -> LS	0.007	0.058	0.122	0.903
TPP -> SMI	0.360	0.057	**6.326**	**0.000**

Source: Authors' analysis results.

5. DISCUSSION OF FINDINGS

The statistical results supported the first hypothesis, implying that family support is crucial for student satisfaction in online learning settings. Family support was revealed to be a significant predictor of student satisfaction with online learning. Students who perceived strong levels of family support reported greater levels of happiness with their online learning experiences. This data supports the notion from previous works (Waterhouse et al., 2022; Wong Siew Yieng et al., 2020) that family support has a direct influence on student satisfaction in distance education. Besides that, the second hypothesis was not supported in this study, indicating insignificant effects of ICT self-efficacy on high school learner satisfaction. This finding opposes previous studies (S. Ali, 2021; Prifti, 2022), which found significant effects of self-efficacy on online courses. Several variables may account for the absence of statistical significance between ICT self-efficacy and learner satisfaction. Students' judgements of their ICT self-efficacy may be impacted by a range of variables, such as their past experience with technology, their perceived need for technology skills, and their degree of confidence in their ability to acquire new technology abilities (Van Wart, Ni, Ready, et al., 2020).

The third hypothesis was also supported, meaning that ICT self-efficacy has substantial effects on high school student interaction with online learning -materials. Previous research (Bervell et al., 2020) also supports this finding of the significant influence of ISE on SMI. Further, the fourth hypothesis was also valid, indicating a positive relationship between School Support (SS) and Learner Satisfaction (LS). The finding suggests that when schools give sufficient assistance to their students, their satisfaction with online learning rises (Bowles, 2021).

Moreover, the fifth hypothesis was supported, confirming the significant effects of Student-Material Interaction on Learner Satisfaction, indicating that higher levels of student-material interaction lead to greater learner satisfaction. This finding is consistent with previous work (Bervell et al., 2020) that suggests that student-content interaction is a crucial aspect of enhancing learning outcomes in online education. The sixth hypothesis was not supported in this study, indicating a weak and insignificant relationship between teacher performance and learner satisfaction in Indonesian high school contexts. This study's finding is in line with previous research (Abubakari et al., 2022), which discovered the same results, contrary to other researchers (Wang et al., 2022), who highlighted the significant role of instructor's performance in digital learning. Finally, the seventh research hypothesis was supportive of previous studies (Abubakari et al., 2022; Solihah et al., 2023), which also indicated a significant association between teacher performance and

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student-material interaction. This suggests that higher levels of teacher performance lead to greater student-material interaction, resulting in better student outcomes.

6. CONCLUSION, LIMITATIONS, AND FUTURE DIRECTIONS

The present study analysed factors that could affect the online learning satisfaction of Indonesian high school students. Six variables were modelled, and the PLS-SEM method was implemented to analyse the data. The study's findings indicate that three variables, namely family support, student-material interaction (SMI), and school support, were the significant influencers of learner satisfaction in the online context. Meanwhile, teacher performance (TPP) and ICT self-efficacy (ISE) had an insignificant effect on learner satisfaction. However, both TPP and ISE significantly affected the SMI variable. Moreover, the study's research model explained the 63.4% variance in online learner satisfaction.

The following elements were the limitations of the current investigation. First, not every high school student had the same chance to participate in the sampling process, as the study employed a non-probabilistic approach. However, the sampled data confirmed the validity and reliability of the suggested research conceptual model. This fact suggests that the research model is replicable in other research projects with various settings. Furthermore, the study did not examine the connections between learner motivation and teacher performance or between motivation characteristics and school support. In order to ascertain their influence on online learning satisfaction, future research can incorporate these significant correlations together with additional factors like personal innovativeness and online self-efficacy. Last but not least, because the study used a cross-sectional methodology, care should be used when extrapolating the results. Therefore, more longitudinal research on online learning in the context of high school learners in developing countries needs to be conducted to confirm the reliability of the current results.

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8. CONFLICT OF INTEREST STATEMENT

The authors declare the absence of any conflicting interests with any individual or organisation.

9. AUTHORS' CONTRIBUTIONS

MSA ideated the research topic and design, formulated research hypotheses and conceptual framework, conducted data analyses and wrote the Methodology and Conclusion sections. AFR wrote the Introduction and Discussion sections and conducted a literature review.

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