

Social networks and their mediating effect on school achievement, enjoyment and anxiety in secondary school students

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Abstract— *This research explored the mediating role of social media use in the relationship between perceived usefulness and ease of use and enjoyment, anxiety, and academic performance among secondary school students in Arequipa, Peru. Employing a non-experimental, cross-sectional design and based on administering a questionnaire with high reliability (Cronbach's alpha of 0.90 and McDonald's ω of 0.91), the study involved 216 students. The study's most significant finding is that perceived usefulness and ease of use have a direct positive impact on the enjoyment of social media, underscoring the importance of designing platforms that are both appealing and accessible to students. Contrary to the initial hypothesis, the use of social media did not significantly mediate anxiety or academic performance, suggesting that these platforms, although beneficial for enjoyment, do not directly influence these latter aspects. This crucial finding points to the need for further investigation into other factors that may influence academic performance and anxiety in the context of digital technology use.*

Keywords—*Enjoyment, Easy to use, School achievement, Use of social networks, Utility, Anxiety.*

I. INTRODUCTION

In secondary education, school enjoyment emerges as a pivotal factor in the learning dynamics of students, bearing significant implications for both their academic performance and emotional well-being. The present research examines the moderating effect of social media and its mediating influence on school enjoyment, academic achievement, and anxiety among secondary-level students in Peru.

School enjoyment, defined as a positive affective response that reflects feelings of pleasure and fun towards the learning process, has been identified as a critical predictor of academic performance. Recent studies underscore the strong correlation between early school enjoyment and subsequent academic performance, even after controlling for variables such as socioeconomic background and cognitive ability [1]. Furthermore, school enjoyment not only positively predicts performance in specific areas such as mathematics, science, and reading but can also mediate student engagement in educational activities [2, 3].

The relationship between school enjoyment and academic performance suggests that enjoyment could be a viable target for educational interventions to improve educational outcomes. This is because enjoyment, unlike less modifiable factors such

as socioeconomic environment, cognitive ability, or gender, can positively influence academic performance by modifying the learning environment and implementing pedagogical practices that foster enjoyable learning experiences [1].

In the context of information and communication technologies (ICTs), mainly social media, their use has been deeply integrated into students' lives, influencing various aspects of their educational experience. Recent research indicates that social media use can positively and negatively affect satisfaction and academic performance. On the one hand, it has been observed that social media use, the perception of its utility, and ease of use can foster positive emotions, which, in turn, positively influence academic performance [4]. On the other hand, negative aspects, such as classroom incivility, have been associated with adverse positions on social media. However, moderate incivility may be related to having more friends and greater prestige online, suggesting a complex and multifaceted relationship between social media use, school enjoyment, and academic performance [5].

This body of research highlights the importance of understanding how social media acts as a mediator between school enjoyment and academic performance and how this understanding can be leveraged to design educational interventions that promote students' emotional well-being and academic success. The evidence suggests that interventions focused on increasing school enjoyment, alongside appropriate and moderate use of social media, could significantly improve the educational outcomes of secondary school students [1, 6, 7].

Thus, the intersection between school enjoyment, the use of social media, and academic performance represents a fertile field for research and educational intervention. By focusing on strategies that promote enjoyment in learning and effectively manage the presence of social media in students' lives, educators and policymakers can improve not only academic performance but also students' overall well-being.

The dynamics between the use of social media and academic performance constitute an area of growing interest in educational research, highlighting a spectrum of influences that encompasses both positive and negative aspects. This analysis delves into the complexity of this relationship, examining

current evidence to elucidate how practices in the use of social media can impact students' learning and academic achievement.

Evidence suggests that the use of social media has a dual impact on academic performance, depending on how these platforms are employed. Some students value using social media to facilitate communication among peers and instructors, which can positively contribute to their educational experience [8]. Conversely, the use of social networking sites, especially Facebook, has been linked to both positive and negative effects on learning, indicating that students with lower academic performance might be at greater risk of a decline in their performance due to intensive use of these platforms [9].

A meta-analysis sheds light on the relationship between social media use and school performance, finding an overall insignificant correlation but small negative correlations associated with time spent on Facebook [10]. This indicates that the impact can vary significantly concerning the type of use and time invested in these platforms.

Furthermore, the literature suggests that a student's prior academic performance can mediate the relationship between social media use and learning performance. Students with lower prior academic achievements seem to be negatively affected by social media use compared to their higher-performing peers [9].

Regarding the potential benefits and drawbacks, social networking sites can serve as productive channels for learning, especially if students connect with bright and talented peers [11]. However, excessive use of these platforms can have a negative impact on academic performance, underscoring the need for a balance in their use [12].

The interaction between social media use and academic performance reveals a complex relationship, where both specific usage practices and the student's academic context influence the observed impact on school performance. Although current evidence is varied and sometimes contradictory, it highlights the need for a deeper understanding of how social media can be effectively used in educational contexts to support learning and enhance academic performance. The need for further research is imperative to unravel these complexities and provide evidence-based guidance on the optimal use of social media in education [8-12].

The impact of social media use on students' academic performance has sparked broad academic debate, revealing a spectrum of effects ranging from negative consequences to potential benefits, depending on the nature and context of use. This analysis seeks to synthesize the diverse perspectives presented in recent literature better to understand the multifaceted impact of social media on education.

Negative consequences of excessive social media use on students' grades have been documented in several studies. Problematic use of social media can divert attention from academic tasks, which impairs course performance [12]. Additionally, a survey of 234 participants revealed a negative correlation between grade point average (GPA) and the number of social networking sites students are subscribed to [13]. It was

found that intensive use of blogs, online games and prolonged time on social media can lead to academic decline [14]. Interestingly, boys tend to use social media apps more often than girls, noting an inverse relationship between the GPA and the number of social media apps used [15].

However, findings in the literature are not uniform. Some studies suggest that social media use can positively impact students' academic performance, depending on how and how much these platforms are used [14-16]. This contradictory evidence underscores the complexity of the relationships between social media use and academic performance, suggesting that context and the nature of use are determining factors.

High school students show a high frequency of social media use, highlighting their proficiency in using these tools for video sharing and chat services. Social media satisfy socio-affective and relational needs, providing entertainment, maintaining contact with friends, and facilitating encounters with new people [17]. Contrary to the perception of a negative impact, it was found that students do not perceive social networks to negatively affect their academic performance, free time or personal relationships [18].

The utility of social media also extends to educational resources, where usage patterns are associated with the perceived usefulness of digital educational resources among university students [19]. However, [20] caution against the negative impact of excessive technology and social media use on academic performance, especially among male students.

Consequently, the relationship between social media use and academic performance is complex and nuanced. While excessive and unregulated use of social media can have negative implications for students' grades, appropriate and moderate use can offer potential benefits, especially when integrated with digital educational resources. This dichotomy underscores the need for further research to elucidate the conditions under which social media can serve as tools to support learning rather than obstacles to academic achievement.

In the context of social media's influence on secondary education, a significant distinction has been observed between the use of platforms designed specifically for teenagers and general social media platforms. This differentiation is crucial for understanding the dynamics of learning, communication, and social interaction that develop in these virtual environments.

Informal learning practices adopted by secondary school students through social media include exploring fields such as career planning, entrepreneurship, and hobbies, indicating an adaptation of these tools for personal and educational development outside the traditional classroom [21]. Communication among teenagers on these platforms is characterized by specific strategies that include relevance, dialogic questions, and a deep understanding of how social media works, which can significantly differ from interactions on general social media platforms [22].

The school environment has seen a widespread integration of social networking sites, affecting educational use and student connectivity profiles [23, 24]. This aspect highlights how social media has become an integral part of the learning environment, influencing how students access information and connect with their educators.

Interactions between teenagers and adults on social networking sites also reveal notable differences compared to general platforms. These interactions include seeking information, creating communities, and online mentoring, underlining the ability of social media to facilitate various educational and personal development interactions [25].

Regulating the use of social media by secondary school students involves various rules and policies, with educators playing a crucial role in overseeing teenagers' online activities. This regulatory framework aims to balance social media use's educational and personal development benefits with the need to protect students' privacy and security [26].

The tendency to actively use privacy features on social media platforms to protect oneself reflects a growing awareness of privacy risks and the importance of granular control over shared information [27]. However, usability limitations can hinder children and teenagers' ability to correctly adjust privacy settings, compromising their safety on social media [28]. Recommendations for enhancing privacy protection include educating teenagers about safe online behaviours and developing software and technologies that effectively address privacy concerns [29].

This analysis underscores the complexity of the relationship between social media and the secondary education environment, highlighting the need for educational strategies and privacy policies that encourage the safe and effective use of these platforms to support students' academic and personal development.

Concerns about privacy and data security on social media are a topic of growing interest among researchers, particularly regarding high school students. Recent studies have identified widespread concern among these youths about collecting and sharing their personal data on social platforms [30-32]. In response to these concerns, there is a highlighted need for developing robust practices and techniques to overcome the privacy risks associated with managing personal data on these networks [30].

The demand from users, including high school students, for control over disclosing their personal information is evident. This need for autonomy over the information shared in the digital environment underscores the importance of providing users with tools and options to manage their privacy effectively [33, 34]. Furthermore, the importance of privacy training and education about intimacy as fundamental components of digital literacy is recognized, especially for high school students, to equip them with the knowledge and skills necessary to navigate the digital space safely [35].

In terms of acceptance and use of social media, a study extending the Technology Acceptance Model suggests that,

although ease of use has a minimal impact, perceived usefulness plays a significant role in users' intentions to use social systems [36]. This highlights how the perception of the value and benefit of these platforms influences the decision of high school students to engage with them actively.

High school students show a high frequency of social media use, demonstrating advanced skills in handling these platforms, sharing videos, and using chat services [17]. These youths' most prevalent modes of interaction include chatting for personal enjoyment, learning, and studying, indicating the diversity of uses these platforms provide [17]. Additionally, teenagers have been observed to use social networking sites to seek academic help, suggesting an inherent educational value in these tools [37].

The impact of social media on academic performance is more fluid. While excessive use of technology and social media harms academic performance, particularly among male students [20], social media are also used for educational purposes. However, their use for such purposes is still considered low [24]. The impacts of social media span both positive aspects, such as connecting with friends and learning new knowledge, and negative ones, including time loss and study distractions [38].

This analysis highlights the complexity of the relationship between high school students and social media, addressing privacy and data security concerns and the educational potential and challenges these platforms present. The need for more robust privacy practices and effective digital education becomes crucial to ensure that students can leverage social media safely and productively. Based on these considerations, the following hypotheses are formulated:

H1: Social media use (SNSU) has a significant mediating effect on perceived usefulness (USEF) and anxiety (AN).

H2: Social media use (SNSU) plays a significant mediating role between perceived usefulness (USEF) and enjoyment (ENJ).

H3: The relationship between perceived usefulness (USEF) and academic performance (PERF) is significantly mediated by social media use (SNSU).

H4: There is a mediating effect of social media use (SNSU) on the connection between ease of use (EOU) and anxiety (AN).

H5: Ease of use (EOU) impacts enjoyment (ENJ) through the significant mediation of social media use (SNSU).

H6: Social media use (SNSU) acts as a mediator in the relationship between ease of use (EOU) and academic performance (PERF), suggesting a significant indirect influence.

II. METHODOLOGY

This study analyses the mediating effect of social media on the interaction between academic achievement, enjoyment, and anxiety among secondary education students in Peru. Adopting a quantitative, non-experimental, and cross-sectional approach seeks to contribute to the existing body of knowledge by

exploring how social media can influence the educational context. The relevance of this research lies in its potential to inform the design of teaching strategies that align with the diversity of learning styles and paces characteristic of the secondary student population.

For data collection, an online survey was administered in an environment supervised by educators, ensuring the reliability and validity of the obtained responses. The sample included 216 high school students, with an equitable gender representation (46.0% male and 54.0% female) and an age range of 14 to 18 years, with an average age of 15.86 years (SD=0.87). The equity in gender representation and diversity of ages enrich the analysis of the mediating role of social media in the educational sphere. The data collection phase was conducted during November and December 2023.

The instrument used for data collection was an adapted version of the research: "Social Networking Site Use, Positive Emotions, and Job Performance" by Ned Kocka [39]; "E-learning success determinants: Brazilian empirical study" by Wilmar Audye Cidral [40], and "The use of social networks, usefulness and ease of use, enjoyment through positive emotions and their influence on school satisfaction mediated by school achievement" by Olger Gutierrez-Aguilar [4]. The items of the instrument are organized on a 7-point Likert scale, where None means (1), almost none (2), rarely (3), sometimes (4), quite a bit (5), frequently (6), and always (7).

After reliability tests and exploratory and confirmatory factor analysis, the structural model was proposed, with the following structure: with two independent variables: Utility (USEF= 3 items) and Easy to use (EOU= 5 items), the mediation variable: Use of social networks (SNSU= 4 items), and as dependent variables: Enjoyment (ENJ= 4 items), School achievement (PERF= 4 items), and Anxiety (AN= 3 items).

III. RESULTS

The results from Table I, obtained through SmartPLS analysis using the Partial Least Squares (PLS) algorithm, showcase the strength of the relationship between the observed items and their corresponding latent constructs, applying a cut-off criterion for acceptance coefficients of ≥ 0.700 .

The findings indicate that most items achieved significant loadings on their respective constructs, suggesting a high validity of the items for measuring the theoretical constructs. For instance, items related to anxiety (AN), especially AN2 (0.974) and AN3 (0.823), exhibit strong relationships with their latent construct. However, AN1 (0.493) does not meet the 0.700 threshold, which could indicate a lesser relevance of this item for the anxiety construct in this context.

In the case of ease of use (EOU), all items (EOU1 to EOU5) surpass the acceptance threshold with loadings ranging from 0.836 to 0.906, reflecting high consistency and a strong relationship of these items with the ease of use construct. This suggests that respondents perceive straightforward usability and accessibility in using the evaluated technologies.

Items associated with enjoyment (ENJ) also display high external loadings (from 0.806 to 0.886), indicating the robust validity of these items for capturing the enjoyment construct. This implies that the enjoyment derived from using the studied technologies is a relevant factor and well represented by the selected items.

Regarding academic performance (PERF), items PERF1 to PERF4 show significant loadings (from 0.842 to 0.912), demonstrating a strong relationship with the academic performance construct. This result underscores the importance of these items in assessing technologies' impact on students' academic performance.

For the use of social networks (SNSU), items SNSU1, SNSU2, SNSU4, and SNSU6 present loadings ranging between 0.793 and 0.908, they are indicating a significant relationship with the construct and validating the measurement of social network use through these items.

Similarly, items related to perceived utility (USEF) exhibit high loadings (from 0.868 to 0.906), confirming the strong association between these items and the perceived utility construct. This reflects the respondents' perceptions of the value and effectiveness of the technologies in question.

Consequently, the results from Table I largely confirm the validity of the items for measuring their corresponding latent constructs in this study, except for AN1. These findings provide a solid foundation for subsequent analysis of the structural relationships between the constructs and for developing educational intervention strategies based on understanding the role of digital technologies in the educational environment.

TABLE I
EXTERNAL LOADS - SMART PLS

	AN	EOU	ENJ	PERF	SNSU	USEF
AN1	0.493					
AN2	0.974					
AN3	0.823					
ENJ1			0.823			
ENJ2			0.886			
ENJ3			0.866			
ENJ4			0.806			
EOU1		0.836				
EOU2		0.890				
EOU3		0.897				
EOU4		0.906				
EOU5		0.903				
PERF1				0.857		
PERF2				0.842		
PERF3				0.912		
PERF4				0.880		
SNSU1					0.793	
SNSU2					0.908	
SNSU4					0.861	
SNSU6					0.845	
USEF2						0.868

USEF3					0.875
USEF4					0.906

Analyzing the coefficients from Table II, it's observed that the construct reliability and validity are reflected in Cronbach's alpha, with results ranging from 0.774 to 0.932, which is acceptable and aligns with commonly accepted standards for internal reliability. The composite reliability coefficient (ρ_a) is used to verify the reliability of the values obtained in the construction and design of the PLS models, and the results, according to the acceptance criterion, should be above 0.7 to demonstrate composite reliability; in this case, the values range between 0.865 and 0.942. The composite reliability criterion (ρ_c) is necessary so that its values exceed 0.6, demonstrating reasonable reliability and internal consistency for each variable, with values ranging from 0.822 to 0.948. The values for the average variance extracted (AVE) are between 0.623 and 0.787, results that exceed the recommended minimum value of 0.500; therefore, it is concluded that convergent validity is acceptable in the model components.

Notably, the composite reliability for all variables is high, with ρ_c surpassing the 0.8 threshold in all cases, indicating excellent internal consistency of the constructs. Moreover, convergent validity, measured by AVE, is also robust across all variables, surpassing the 0.5 cut-off point and reaching up to 0.787 for ease of use (EOU), which is notably high. This suggests that a substantial proportion of the variance of the items is explained by the constructs to which they are assigned.

The reliability and validity of the constructs used in this study are generally high, suggesting that the items used to measure each construct are appropriate and that the constructs are solid and well-defined.

TABLE II
CONSTRUCT RELIABILITY AND VALIDITY - OVERVIEW

	Cronbach's Alpha	ρ_a	ρ_c	Average variance extracted (AVE)
Anxiety	0.774	0.922	0.822	0.623
Easy to use	0.932	0.942	0.948	0.787
Enjoyment	0.867	0.868	0.910	0.716
School achievement	0.896	0.904	0.928	0.763
Use of social networks	0.874	0.877	0.914	0.727
Utility	0.859	0.865	0.914	0.780

To verify the discriminant validity of the model, the criterion proposed by Fornell and Larcker in 1981 [41] was utilized. This criterion suggests that the square root of the Average Variance Extracted (AVE) for each variable should be greater than the observed correlations among the variables under study. Observing the presented matrix, the results indicate that discriminant validity has been successfully established, as the values on the diagonal (which represent the square root of the AVE of each construct) are more significant than the inter-construct correlations corresponding to that row and column.

Analyzing the results, for the Anxiety (AN) construct, the square root of the AVE is 0.789, which is higher than all observed correlations with other constructs, confirming discriminant validity. The ease of use (EOU) shows a square root of the AVE value of 0.887, which is considerably higher than its correlations with the other constructs, thereby validating its discrimination. Enjoyment (ENJ), with a square root of the AVE of 0.846, also surpasses all correlations with other constructs.

Academic performance (PERF) has a square root of the AVE of 0.873, which is higher than the correlations with the other constructs, confirming its discriminant validity. Social networks (SNSU) and utility (USEF) have square roots of the AVE of 0.853 and 0.883, respectively, both exceeding the correlations with other constructs and thus confirming their discriminant validity.

According to Fornell and Larcker's criterion, these results indicate that each construct is uniquely captured by its items and can be clearly differentiated from the other constructs within the model. This suggests that the constructs have sufficient discriminant validity, and the model is suitable for proceeding with more detailed analyses of the paths and structural relationships proposed in the study. (Please refer to Table III for details).

TABLE III
FORNELL-LARCKER CRITERION

	AN	EOU	ENJ	PERF	SNSU	USEF
AN	0.789					
EOU	-0.011	0.887				
ENJ	0.191	0.542	0.846			
PERF	0.090	0.322	0.296	0.873		
SNSU	0.154	0.392	0.690	0.258	0.853	
USEF	0.060	0.341	0.497	0.426	0.456	0.883

The heterotrait-monotrait (HTMT) ratio, as proposed by Henseler, Ringle [42], and Sarstedt in 2015 [43], has been used to assess the discriminant validity of the constructs. This metric is preferred because the results are valid, with values below the conservative cut-off point of 0.85 suggested by Franke and Sarstedt in 2019. The values in Table IV are below the 0.85 threshold, indicating adequate discriminant validity among the evaluated constructs.

Notably, the highest reported correlation is between enjoyment (ENJ) and the use of social networks (SNSU), with a value of 0.782 below the 0.85 threshold and suggests that, although related, they are distinct constructs. The other correlations are significantly lower than the threshold, indicating that the constructs are discriminant from one another. For example, the correlation between the use of social networks (SNSU) and utility (USEF) is 0.525, which is considerably lower than the 0.85 threshold, suggesting a clear differentiation between how students perceive the utility of social networks and how they use them.

These results support the conclusion that the constructs in the study are discriminant and, therefore, measure different

aspects of primary-level students' attitudes and behaviours towards digital technologies, including the moderating impact of gender. The discriminant validity confirmed by the HTMT analysis indicates that each construct captures unique phenomena, allowing the study to proceed with pathway analysis and understanding the proposed structural relationships.

TABLE IV
HETEROTRAIT CRITERION - MONOTRAIT -HTMT

	AN	EOU	ENJ	PERF	SNSU	USEF
AN						
EOU	0.091					
ENJ	0.173	0.596				
PERF	0.104	0.350	0.339			
SNSU	0.158	0.419	0.782	0.282		
USEF	0.100	0.371	0.572	0.475	0.525	

The R-squared (R^2) values in Figure 1 provide a quantitative insight into how much variance in each dependent construct is explained by the independent constructs in the model. These values are crucial for assessing the strength and utility of the proposed model in a study.

The low R^2 for anxiety (AN) at 0.030 suggests that the independent variables included in the model hardly explain the variance in anxiety. This indicates that there are other factors not considered in the model that could be significantly influencing students' anxiety levels. Future research should explore additional variables that could contribute to anxiety related to using digital technologies.

In contrast, enjoyment (ENJ) has an R^2 of 0.586, implying that more than half of the variance in students' enjoyment is explained by the model variables. This robust result underscores the relevance of the factors included in the model for understanding what contributes to students' enjoyment in the context of using digital technologies.

Academic performance (PERF), with an R^2 of 0.217, reveals that the model explains a significant, though not majority, proportion of the variance in academic performance. This suggests that while the selected variables have a noticeable impact on academic achievement, other determinants of school success are not captured by the current model.

Finally, the use of social networks (SNSU) shows an R^2 of 0.271, indicating that the model captures approximately 27.1% of the variance in students' use of social networks. This value is significant but also leaves room for other potentially influential variables to be explored in future research to understand better the dynamics of students' use of social networks.

Interpreting these R^2 values should consider not only the magnitude of the explained variance but also the relevance of the variables in the context of educational research. While lower R^2 values indicate the need to explore other explanatory variables, higher R^2 values validate the importance of the included variables and suggest that interventions based on these findings could significantly impact the positive aspects of

learning and the student experience with digital technologies. See Figure 1.

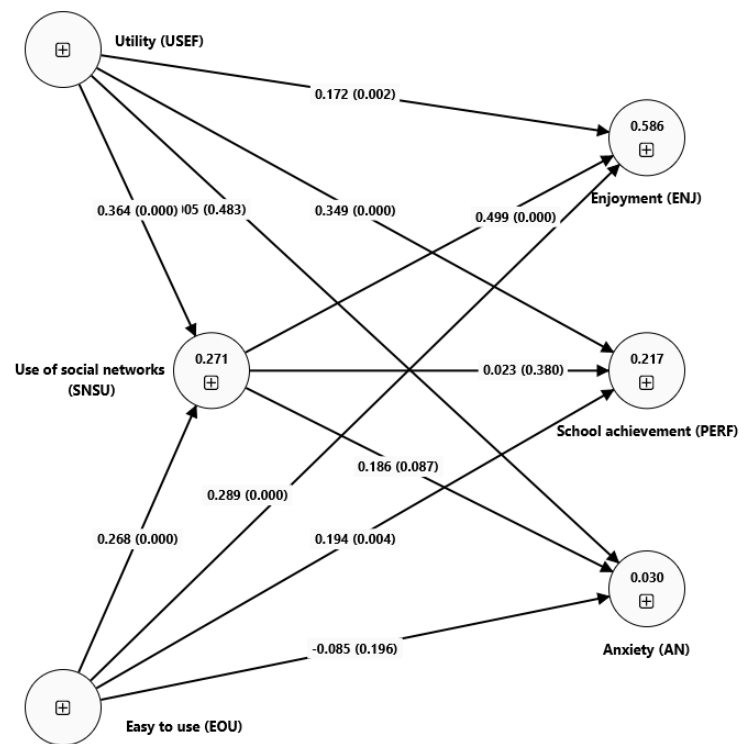


Figure 1 Model R^2 – Mediating effect - SmartPLS.

The results from Table V provide p-values that allow us to evaluate the statistical significance of the relationships between variables in the structural model: Ease of Use (EOU) -> Anxiety (AN): The p-value of 0.196 indicates that there is not enough statistical evidence to assert a significant relationship between ease of use and anxiety. Ease of Use (EOU) -> Enjoyment (ENJ): With a p-value of 0.000, this relationship is statistically significant, indicating that ease of use is positively associated with enjoyment. Ease of Use (EOU) -> Academic Performance (PERF): The p-value of 0.004 signals a positive and statistically significant relationship, implying that greater ease of use could be associated with better academic performance. Ease of Use (EOU) -> Use of Social Networks (SNSU): A p-value of 0.000 denotes a strong and positive relationship between ease of use and the use of social networks.

Use of Social Networks (SNSU) -> Anxiety (AN): With a p-value of 0.087, this relationship does not reach statistical significance at the 0.05 level, suggesting that a significant influence of social network use on anxiety cannot be confirmed. Use of Social Networks (SNSU) -> Enjoyment (ENJ): The p-value of 0.000 supports a positive and highly significant relationship, indicating that the use of social networks has a considerable impact on students' enjoyment. Use of Social Networks (SNSU) -> Academic Performance (PERF): With a p-value of 0.380, the relationship between the use of social

networks and academic performance is not statistically significant.

Perceived Utility (USEF) -> Anxiety (AN): A p-value of 0.483 indicates that there is no statistically significant relationship between perceived utility and anxiety. Perceived Utility (USEF) -> Enjoyment (ENJ): The p-value of 0.002 shows that there is a positive and statistically significant relationship between perceived utility and enjoyment. Perceived Utility (USEF) -> Academic Performance (PERF): With a p-value of 0.000, perceived utility is significantly related to academic performance, suggesting that students who find utility in social networks tend to have better academic performance. Perceived Utility (USEF) -> Use of Social Networks (SNSU): A p-value of 0.000 indicates a positive and significant relationship between perceived utility and the use of social networks.

The significant relationships (p-value < 0.05) support the idea that both ease of use and perceived utility are essential predictors of enjoyment and the use of social networks and that both significantly impact academic performance. The non-significant relationships (p-value > 0.05) suggest that other factors not captured by the model influence anxiety and academic performance in relation to the use of social networks.

TABLE V
BOOTSTRAPPING TEST RESULTS

Path coefficients	Original sample (OR)	Sample mean (M)	Standard deviation (STDEV)	t-Statistics (O/STDEV)	p-value
Easy to use (EOU) -> Anxiety (AN)	-0.085	-0.086	0.099	0.857	0.196
Easy to use (EOU) -> Enjoyment (ENJ)	0.289	0.288	0.058	4.995	0.000
Easy to use (EOU) -> School achievement (PERF)	0.194	0.194	0.073	2.634	0.004
Easy to use (EOU) -> Use of social networks (SNSU)	0.268	0.268	0.070	3.841	0.000
Use of social networks (SNSU) -> Anxiety (AN)	0.186	0.164	0.136	1.362	0.087
Use of social networks (SNSU) -> Enjoyment (ENJ)	0.499	0.500	0.054	9.225	0.000
Use of social networks (SNSU) -> School achievement (PERF)	0.023	0.022	0.074	0.305	0.380
Utility (USEF) -> Anxiety (AN)	0.005	0.014	0.110	0.042	0.483
Utility (USEF) -> Enjoyment (ENJ)	0.172	0.170	0.060	2.859	0.002
Utility (USEF) -> School achievement (PERF)	0.349	0.351	0.067	5.182	0.000
Utility (USEF) -> Use of social networks (SNSU)	0.364	0.365	0.067	5.467	0.000
Easy to use (EOU) -> Anxiety (AN)	-0.085	-0.086	0.099	0.857	0.196
Easy to use (EOU) -> Enjoyment (ENJ)	0.289	0.288	0.058	4.995	0.000
Easy to use (EOU) -> School achievement (PERF)	0.194	0.194	0.073	2.634	0.004

Table VI showcases the results from the bootstrapping test to assess specific indirect effects across six different hypotheses. The results are based on p-values and the original path coefficients from the sample model. The statistical significance of these effects is determined by p-values, with a

commonly accepted threshold of 0.05 to determine significance. Here are the results:

H1: The indirect effect is 0.068 with a p-value of 0.105, indicating insufficient evidence to assert that the use of social networks mediates a significant relationship between perceived utility and anxiety.

H2: With an indirect effect of 0.182 and a p-value of 0.000, there is a significant and medial relationship between perceived utility and enjoyment through the use of social networks. This suggests that students who find social networks functional tend to enjoy their use more.

H3: The indirect effect is 0.008 with a p-value of 0.384, meaning there is no significant relationship between perceived utility and academic performance mediated by the use of social networks.

H4: The indirect effect is 0.050 with a p-value of 0.103, indicating that the use of social networks does not significantly mediate the relationship between ease of use and anxiety.

H5: With an indirect effect of 0.133 and a p-value of 0.000, there is a significant and mediable relationship between ease of use and enjoyment through the use of social networks. This suggests that the ease with which students can use social networks contributes significantly to their enjoyment of them.

H6: The indirect effect is 0.006 with a p-value of 0.385, indicating no significant relationship between ease of use and academic performance mediated by the use of social networks.

The results show that utility and ease of use significantly indirectly affect enjoyment (ENJ) when mediated through social networks. However, these same factors do not appear to have a significant mediating effect on anxiety or academic performance in this model. These findings underline the relevance of utility and ease of use in how students experience the enjoyment of social networks, which is crucial information for educators and policymakers looking to incorporate these platforms into learning environments.

TABLE VI
BOOTSTRAPPING TEST RESULTS – SPECIFIC INDIRECT EFFECTS

Hypothesis	Original sample (OR)	Sample mean (M)	Standard deviation (STDEV)	t-Statistics (O/STDEV)	p-value
H1. Utility (USEF) -> Use of social networks (SNSU) -> Anxiety (AN)	0.068	0.061	0.054	1.256	0.105
H2. Utility (USEF) -> Use of social networks (SNSU) -> Enjoyment (ENJ)	0.182	0.183	0.039	4.653	0.000
H3. Utility (USEF) -> Use of social networks (SNSU) -> School achievement (PERF)	0.008	0.008	0.028	0.294	0.384
H4. Easy to use (EOU) -> Use of social networks (SNSU) -> Anxiety (AN)	0.050	0.042	0.039	1.266	0.103
H5. Easy to use (EOU) -> Use of social networks (SNSU) -> Enjoyment (ENJ)	0.133	0.134	0.038	3.477	0.000
H6. Easy to use (EOU) -> Use of social networks (SNSU) -> School achievement (PERF)	0.006	0.006	0.021	0.293	0.385

IV. CONCLUSIONS

The study's findings indicate that both perceived utility and ease of use have statistically significant indirect effects on students' enjoyment regarding the use of social networks. This highlights the importance of considering how the perception of value and accessibility of social networks contributes to student enjoyment. For educators and designers of educational technology, these results suggest that enhancing students' enjoyment can be achieved by improving social media platforms' utility and ease of use. Therefore, interventions and developments in educational technologies should focus on incorporating relevant and meaningful content and ensuring that platforms are intuitive and accessible to students.

The study did not find evidence of significant mediation of social network use between perceived utility or ease of use and anxiety or academic performance. This suggests that the use of social networks, as conceived and measured in this study, is not a determining factor in modulating student anxiety nor a significant predictor of academic performance. These results are crucial for understanding that while social networks can be valuable tools for enhancing positive aspects such as enjoyment, their impact on anxiety and academic performance may be more complex and influenced by a broader range of factors. Therefore, additional research is needed to explore other possible mechanisms or variables that may influence anxiety and academic performance in the context of social network use and other digital technologies.

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