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Smartphone Addiction on Motivation and Attitude to Learning English in Peruvian Adolescents

Abstract

This study investigates the influence of smartphone addiction on motivation and attitude in English language learning. The sample consists of 297 Peruvian high school students from the city of Lima. Data collection was carried out using the Short Version of the Smartphone Addiction Scale, the English Language Learner Motivation Scale, and the Attitude Towards Learning English Scale. The data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM), with the SmartPLS 4 software. The findings show optimal results for the measurement model. At the structural model level, the study revealed that smartphone addiction negatively affects motivation and attitude in English learning ($\beta = -.267$; $p < .001$ and $\beta = -.109$; $p = .107$), with an explained variance of 7.1% and 1.2%, respectively. Finally, the study contributes to expanding the understanding of smartphone addiction in English language teaching.

Keywords: *Attitude, learning english, motivation, Peruvian adolescents, smartphone addiction.*

Introduction

In the current context of the digital age, it can be said that the smartphone is a favorable tool that enables the dissemination of information and can enhance students' learning (Yoon et al., 2025; Syakinah & Daulay, 2022). Jeong et al. (2016) report that users use their smartphone for academic learning purposes, social networking, online gaming, and entertainment. According to Husna et al. (2021), in this digital era, collaborative education is experienced where a smartphone is sought as a facilitator of learning and its main users are students of different ages. However, now its use is being uncontrolled turning into addiction. Smartphone addiction affects all areas of life bringing negative consequences (Park et al., 2019). Sunday et al. (2021) refer that it has a negative effect on learning. Among the consequences on learning we can mention distraction in class, decreased concentration, poor performance, being the writing of text messages (chat), review of social networks the ones that most interfere with the development of academic tasks (Campbell, 2006; Emanuel et al., 2015; Harman & Sato, 2011; Sunday et al., 2021). Also the negative effect is on mental and physical health, interpersonal relationships, loneliness and loss of calmness (Fu et al., 2021; Kibona & Mgaya, 2015; Mahapatra, 2019). The literature reports that adolescents currently consider smartphones essential to their lives; making them more vulnerable to addiction (Yoon et al., 2025; Park et al., 2019).

One of the critical factors for continuous student learning and achieving academic success is through learning motivation (Syakinah & Daulay, 2022; Ye et al., 2022). Motivation is described as an internal and unobservable state at the individual level, which drives and orients behavior toward goal attainment to satisfy needs (Pincus, 2023). It is reported that online game addiction and access to short online videos can negatively affect learning motivation (Wang & Zhu, 2024; Ye et al., 2022). On the other hand, learning attitude defined as the affective, cognitive, and understanding behavior for or against learning (Wang & Zhu, 2024) or the action the learner takes based on the various situations he or she faces (Mi-Young, 2019) is another factor that also benefits students' learning (Ching-jun et al., 2009). However, current studies report that mobile game addiction negatively influences learning attitude (Wang & Zhu, 2024).

In this society in which we live, languages, especially English, play an important role in order to move successfully in this scenario (Garrido-Hornos, 2023). In a globalized world learning English is

one of the new competencies that is necessary to have (Zorlu & Ünver, 2022). The literature indicates that motivation and attitude are relevant factors for second language acquisition (Garrido-Hornos, 2023). Hence the need to understand these variables.

It can be observed in the literature studies regarding internet addiction in its various types such as online games, short videos and how these negatively affect learning motivation and learning attitude, most of these conducted in Asian countries (Rahayu et al., 2021; Wang & Zhu, 2024; Ye et al., 2022), however there are no reports of studies in Latin American context and the relationship between smartphone addiction on motivation and attitude to learn English. Studies in different contexts are suggested by scholars for a better understanding of study phenomena (Ye et al., 2022).

Therefore, the objective of this research is to determine the influence of smartphone addiction on motivation and attitude to learn english in peruvian adolescents. To this end, the research question are:

- a) Do the smartphone addiction significantly predict the motivation to learn English?
- b) Do the smartphone addiction significantly predict the attitude to learn English?

The present study will contribute to the body of literature in understanding the effect of smartphone addiction on motivation and attitude to learning English in adolescents. Further research may also be generated from it. In addition, the results can serve as an input for school administrators and teachers in the generation and implementation of appropriate strategies to improve the English language learning of secondary school students, taking into account the control of smartphone addiction and its effect on the motivation and attitude of students. On the other hand, government education policy makers can leverage the data to generate policies to control the use of smartphones in schools.

Literature Review

Smartphone Addiction

It is a phenomenon that is related to the impulsive use of the smartphone (Cha & Seo, 2018). According to Lopez-Fernandez (2017) the symptomatology of these addiction are six: 1) Loss of control, 2) Interference with family relationships and academic development, 3) disregard for consequences, 4) Isolation, 5) Preoccupation, and 6) Tolerance.

32 The present study with smartphone addiction can be based on the Theory of uses and
15 gratifications (U&G Theory). This theory suggests that people freely and consciously choose the type
of platform use to satisfy their needs (Wibowo, 2022). Malik et al. (2016) refers that smartphones have
applications for users to satisfy such needs and are chosen over other media such as television. There is
also ample evidence that the U&G theory explains the study of the effect of smartphone addiction and
academic performance (Abbasi et al., 2021).

Motivation to Learning

Motivation for learning refers to both an internal and external drive that prompts students to
actively learn, allowing them to continue participating in educational activities to achieve their academic
goals. There is also introjected regulation which is an intermediate of both motivations, in which the
26 individual accepts the regulation and behaves in a certain way, albeit with some external pressure (Wang
10 & Zhu, 2024; Garrido-Hornos, 2023). Ye et al (2022) define learning motivation as the ability to enjoy
or engage in an activity without reinforcement (intrinsic) or with the requirement of external factors
(e.g., incentives).

47 The literature reports that learning a second language can lead to a decrease or loss of
motivation, therefore, for teachers, motivation is very important in second language learning because
by examining the level of motivation one can know the level of commitment to learn a second language
(Garrido-Hornos, 2023). The motivation development is essential for people facing new contexts and
12 the motivation plays an important and positive role in the level of knowledge absorption. (Ye et al.,
2022).

Attitude to Learning

13 Attitude toward learning is defined as a learner's beliefs or perceptions toward learning and their
cognitive, emotional, and behavioral responses displayed consistently and continuously, influencing
their effectiveness and engagement in learning (Wang & Zhu, 2024). It can also be defined as consistent
positive or negative beliefs, cognitions, and ideas toward learning-related activities (Tsai & Tang, 2017).
La attitude to learning is considered as a mental state of readiness of the individual to respond to an
activity or task, such readiness having been formed on the basis of past experiences. (Mi-Young, 2019).
It is also defined as an affective and cognitive behavior in favor or against learning (Tsai & Tang, 2017).

It is a disposition to action, but not an action in itself, which cannot be observed but can be deduced from the behavior of the individual (Ching-jun et al., 2009).

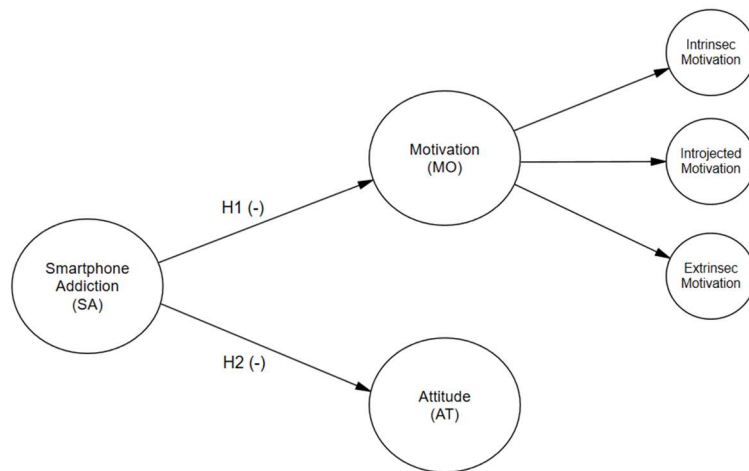
Influence of Smartphone Addiction on Motivation and Attitude to Learning

The literature shows several studies on the negative effect of smartphone addiction on motivation and attitude to learning in Asian school, university and postgraduate contexts, focusing on online games and short videos (Wang & Zhu, 2024; Ye et al., 2022; Rahayu et al., 2021). Sunday et al. (2021) in their meta-analysis sought to resolve several questions about the negative effect of smartphone addiction on learning. In their analysis of various countries (Africa, Asia, Europe and America) and in school and university contexts, they show that in the situation where students are unable to control their smartphone use and experience addiction, it is necessary to implement cognitive-compartmental therapies and clinical interventions. On the other hand, the context, grade level, type of application significantly moderated the significant effect of smartphone addiction on academic achievement.

There is not much research on it at least conducted on high school students of smartphone addiction as attitude to learning. An example of a study is the following; in a sample of Chinese master's and doctoral graduate students is reported, it was found that smartphone addiction negatively and significantly affects learning attitude (Wang & Zhu, 2024). The literature reports that addiction to online games and short videos in students negatively and significantly affects the learning motivation of students in Asian context (Rahayu et al., 2021; Wang & Zhu, 2024; Ye et al., 2022). From the above theory, the following hypothesis can be suggested. From the above theory, the following hypothesis can be suggested (Figure 1):

H1: The smartphone addiction has a negative and significant effect on motivation to learn

H2: The smartphone addiction has a negative and significant effect on attitude to learn

Figure 1*Research model*

Note. SA is smartphone addiction, MO is motivation, AT is attitude

Methodology

The research was conducted under the quantitative paradigm. The study was cross-sectional and explanatory because it seeks to determine the influence of the independent variables on the dependent variables (Creswell and Creswell, 2018). This type of study is also considered causal-comparative because it focuses on examining cause-effect relationships between different variables (Zorlu et al., 2025).

Population and Sample

The study population (N=480) was constituted by students of fourth and fifth grade high school in 2024 from the Mariscal Ramon Castilla school of the city to Lima (Peru). The sampling was non-probabilistic by convenience. The instrument was applied to 319 volunteer students. Surveys with missing data and outliers were removed. Therefore, the final sample for the study was 297 participants. The average age of participants was 16 years old. About 70% of the students reported a daily smartphone usage of more than three hours in non-academic subjects such as social networks, online games, videos, among others. Table 1 shows the sociodemographic information of the participants.

Table 1*Socio-demographic profile (n=297)*

	Frequency	Percentage (%)
Gender		
Male	157	52.9
Female	140	47.1
Grade level		
Fourth grade	144	48.5
Fifth grade	153	51.5
Daily non-academic use smartphones		
Less than 3 hours	65	21.9
3 to 5 hours	144	48.5
More than 5 hours	88	29.6

Note. Non-academic refers to use chat, online games, social networks, videos, movies, others

Data Collection Tools

The Smartphone Addiction Scale was taken from Lopez-Fernandez (2017) in Spanish version. It presents a total of ten items and it is a one-dimensional scale, measured with a five-point Likert scale: 1) Strongly disagree to 5) Strongly agree. Its alpha coefficient is acceptable ($\alpha = .88$). Another instrument was the Learning Motivation Scale adapted from Ardasheva et al. (2012) which consists of 12 items and three dimensions: Intrinsic Motivation, Introjected Regulation and External Motivation. It presents a five-point Likert score from 1 (completely disagree) to 5 (completely agree). The reliability of the instrument is $\alpha = .80$. Finally, the Learning Attitude Scale was adapted from Gonzalez Ardeo (2016) of 10 items, unidimensional. With a five-point Likert score from 1 (Completely disagree) to 5 (Completely agree). The reliability of the instrument is $\alpha = .7$. The motivation and attitude scales were adapted to Spanish by the double translation method (Muñiz et al., 2013).

Data Collection

The educational institution by this research was contacted and the permission was obtained from the administration to collect data from the students. The total questionnaire consisting of the scales smartphone addiction, motivation and attitude to learning English and was applied in the period from March to April 2025 using the physical format with an average duration of twenty minutes. All

participants received instructions on how to fill out the questionnaire. It was also indicated that all data collected was confidential and for academic purposes. Only consenting students participated in filling out the questionnaire. Prior to contact with the school, permission was obtained from the ethics committee of the Universidad Peruana Unión for the collection of data from the study sample, following the principles of the Helsinki code (Manzini, 2000).

Data Analysis

In data cleaning, missing data were removed. Outliers were evaluated using the Mahalanobis test, the data that presented the probability of mahalanobis below the cut-off point ($p \leq 0.001$) were eliminated. (Tabachnick & Fidell, 2014). This test was evaluated with the software SPSS v.29. For descriptive analysis, it was determined the mean (M), the standard deviation (SD) and univariate normality by Asymmetry and kurtosis. The acceptable values to meet the assumption of univariate normality are skewness and kurtosis of -2 to 2; although there is literature that extends the range from -3 to 3. (Kline, 2016; Bandalos & Finney, 2019). The software for this test was the Smart PLS4. In order to guarantee the credibility of the data collected by instruments, it was carried the assessment of measurement bias by the common bias method with the Harman's single factor test. In the Harman test, if the total variance of the exploratory factor analysis without rotation is less than the 50% threshold, then there is no risk of common method bias, i.e. the instrument measure different aspects. (Awais et al., 2023; Hair et al., 2017; Podsakoff et al., 2003).

Statistical analyses of the research model were performed by PLS-SEM for higher-order constructs (HOC), using the Smart PLS4 software. To analyze the higher order construct, a two-step method was applied. First, it was modeled at the level of first order constructs (LOC). In the case of the HOC-type construct, the dimensions were used as LOCs, which were transformed into synthetic indicators. In this first stage the measurement model was evaluated considering reliability, communalities, factor loadings, convergent validity (AVE) and discriminant validity (Henseler et al., 2015; Hair et al., 2017; Hair et al., 2013). For step two the structural model was analyzed the standardized regression coefficients (path coefficient), significance of hypotheses by bootstrapping and explained variance (Hair et al., 2017; Zinbarg et al., 2005).

Findings

The missing data were 2.51% of the total data and the outliers were 4.39%. For both cases these data were removed. From the data collected, skewness and kurtosis values between +1 and -1 below the criteria given by the literature (Kline, 2016; Bandalos & Finney, 2019) were observed, so the data presented acceptable univariate normality (Table 2). Regarding the evaluation of the common bias method by one-factor analysis and without rotation, a total explained variance of 24.856% was obtained, which was below the limit value of 50% given by the literature (Awais et al., 2023; Hair et al., 2017; Podsakoff et al., 2003). So it can be indicated that the whole instrument measured different aspects.

Table 2

Data profile

Variable	M	DE	g1	g2
Smartphone addiction	3.332	1.179	-.12	-.87
Motivation to learn English	3.817	1.034	-.79	.53
Attitude to learn English	3.797	1.006	-.73	.29

Note. M es mean, DE is Standard desviation, g1 is Asymmetry, g2 is kurtosis

Based on the evaluation of the measurement model, the Table 3 shows the indicators that presented factor loadings greater than 0.6. The literature reports that the factor loadings that are within the range of .4 to .7 can be removed as long as the debugging increases the reliability or the average variance extracted (Hair et al., 2017). Of the 32 initial items, 8 items were removed from the smartphone addiction scale (items 1, 2 and 3), from the motivation scale (items 2 and 10) and from the attitude scale (items 3, 4 and 5). For all first-order constructs, acceptable reliability was obtained by presenting higher values of coefficient alpha (CA) and composite reliability (CR) greater than .7. The same profile for the mean variance extracted with AVE values greater than .5, according to the evaluation criteria by literature (Hair et al., 2017).

Table 3
Indicators loading, reliability y validity of constructs

Indicators	Loading	CA	CR	AVE
Smartphone addiction				
SA4	.645	.849	.884	.524
SA5	.799			
SA6	.804			
SA7	.754			
SA8	.721			
SA9	.632			
SA10	.691			
Intrinsic motivation				
MO1	.601	.818	.844	.523
MO3	.873			
MO4	.736			
MO5	.736			
MO6	.640			
Introjected motivation				
MO7	.881	.749	.888	.799
MO8	.906			
Extrinsic motivation				
MO9	.752	.717	.840	.637
MO11	.803			
MO12	.837			
Attitude to learn english				
AT1	.710	.869	.894	.548
AT2	.769			
AT6	.718			
AT7	.781			
AT8	.625			
AT9	.723			
AT10	.836			

Note. CA: Cronbach's Alpha, CR: Composite Reliability, AVE: Average Variance Extracted

Regarding the discriminant validity (Table 4), it was observed that for all the HTMT ratio constructs are below the threshold of 0.85 established by the literature (Henseler et al., 2015), therefore there is discriminant validity between the constructs under study, i.e., the constructs capture information in a way from each other when the ratios are less than the threshold (Hair et al., 2017).

Table 3*Discriminant Validity for HTMT criterion*

First order variables	Smartphone addiction	Intrinsic motivation	Introjected motivation	Extrinsic motivation	Attitude
Smartphone addiction					
Intrinsic motivation	.128				
Introjected motivation	.314	.596			
Extrinsic motivation	.285	.750	.796		
Attitude	.109	.787	.534	.715	

According to the results of the structural model (Table 5) it was observed that smartphone addiction had a negative and significant influence on the motivation to learn English, however, it was not significant on attitude, presenting values for H1 and H2 ($\beta = -.267$; $p < 0$ and $\beta = -.109$; $p = .107$) respectively. Regarding the effect size (f^2), it was observed that smartphone addiction had a significant and small effect on motivation to learn English ($f^2 = .077$). In the case of the effect on attitude, it was not significant and its effect was smaller ($f^2 = .012$) than the minimum value of .02 reported in the literature.

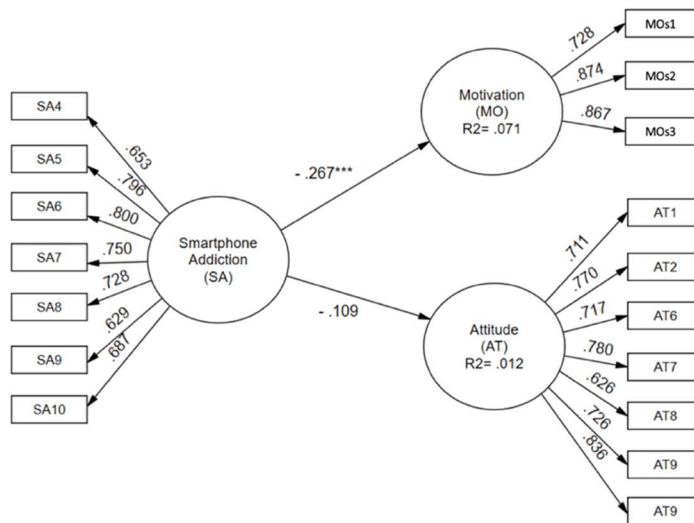
Table 5*Hypotheses testing*

Path	Path coefficient (β)	Sample mean (M)	Standard deviation (DE)	T-Statistic (significance)	p-value	Hypothesis
Smartphone addiction $\rightarrow$ Motivation	-.267	-.282	.047	5.674	.008	Supported
Smartphone addiction $\rightarrow$ Attitude	-.109	-.131	.088	1.243	.166	Not supported

The evaluation of the structural model (Figure 2) was performed considering all the variables of the model as lower order constructs (LOCs) and of formative-formative type. The initial model presented the motivation construct as higher order (HOCs) because it had three dimensions, however it was transformed to a LOCs following the two-step method proposed by Sarstedt et al. (2019). As an explanatory result, it was observed that smartphone addiction explains 7.1% of the motivation for learning English and 1.2% for attitude.

Figure 2

Structural model result



Note. SA refer to smartphone addiction, MO is motivation, MOs is motivation's sintetic indicator, AT is attitude.

Discussion and Conclusions

This study examined the influence of smartphone addiction on motivation and attitude to learn English in Peruvian high school students. The literature reports that the adolescent stage, unlike other stages, is the most vulnerable for adopting smartphone addictive behavior as adolescents come to consider the smartphone as essential to their lives (Yoon et al., 2025). This situation negatively affects students' learning (Park et al., 2019). The present study focused on English language learning. The results showed that smartphone addiction negatively and significantly influences English learning motivation ($\beta = -.267$; $p < .001$) and regarding attitude a negative but not significant effect was observed ($\beta = -.109$; $p = .107$).

The results are in line with the findings of previous studies conducted in other contexts such as Asian students at different school, university and graduate levels (Wang & Zhu, 2024; Ye et al., 2022; Rahayu et al., 2021). Regarding hypothesis 1, the observed negative effect may be because the applications available on smartphone are more attractive (social networks, online games, videos, others) than those provided by the traditional English learning method. Therefore, the motivation to learn English may decrease. The literature refers that the internal motivation depends on enjoying what you

do (Ye et al., 2022). On the other hand, students may lose interest in the incentives to learn English due to lack of or inadequate external motivation. So, learners find better external incentive in the satisfaction of smartphone overuse.

In the case of hypothesis 2, where it was identified that smartphone addiction in high school students affects, but not significantly, their attitude towards learning English. Ruling out the possible causes of error, in the present study of the measurement model it was possible to corroborate the validity of the all instruments according to the literature parameters in reliability, factor loading, AVE, discriminant validity (Hair et al., 2017; Hair et al., 2013; Henseler et al., 2015). The analysis the common bias method, explained variance less than the 50% threshold was obtained (Awais et al., 2023; Podsakoff et al., 2003). Another factor may be the sample size of 297 participants, however, the PLS-SEM method is reliable for small samples (Hair et al., 2017). So that possible non-significance goes more for an issue of study context than methodological. Wang and Zhu (2024) reported a negative and significant effect in students who were mostly university students, unlike the sample under study, which was made up of adolescents from high schools. Sunday et al (2021) report that the degree of addiction effect depends on the academic level. It is important to point out that the low value of the effect size and the high p-value obtained in the present investigation are in accordance with the literature, which indicates that both parameters are inversely proportional. In turn, the significance of the p-value depends on the sample size (Frias Navarro et al., 2000). In turn Khalilzadeh and Tasci (2017) report that the effect size is small when its value is 0.01. For the case of the study, an effect size of 0.012 was obtained. So it could be considered that smartphone addiction has a marginal effect on the attitude to learn English. So students' mental and emotional state for learning English is minimally affected by smartphone overuse.

From the findings, it can be concluded that smartphone addiction among high school students in Peru negatively affects their motivation and attitude towards learning English. Their results, although small, indicate that students do not enjoy the traditional methodology of learning English, and therefore are not internally motivated because they do not enjoy it. It can also be indicated that external motivation, such as good incentives, is absent from the English teachers or is inadequate, so that students are more motivated by being connected to their cell phones than by learning English in classrooms.

Regarding the marginal effect of smartphone addiction on attitude, it can be concluded that the mental and emotional state is minimally altered for English learning.

Hence, the importance of this study, because by leveraging the data, strategies for controlling cell phone use can be generated at the educational center level, updating English teaching methodologies for today's more tech-savvy students, and showing the incentives for learning English more effectively by the teachers. Also, policymakers can take advantage of the study's results to generate curricular policies or also programs or psychological interventions to help students face the smartphone addiction problem with better tools.

Limitation and Future Works

The study had certain methodological limitations. It was cross-sectional type and therefore the results cannot be generalized; longitudinal studies would be necessary to better understand the effect of smartphone addiction over long-time. In turn, the results are limited to a single institution; the study should be replicated by comparing it with other private and national educational institutions. The present quantitative study should be complemented with a qualitative case study to have a more holistic understanding of the effect of smartphone addiction on student motivation and attitude. Mediating or moderating variables in the relationship between the variables under study should also be considered for future research.

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