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ORIGINAL

Use of mobile devices and video games in the learning of students at the Faculty of Tourism of the Autonomous University of Sinaloa

Uso de dispositivos móviles y videos juegos en el aprendizaje de estudiantes de la facultad de turismo de la Universidad Autónoma de Sinaloa

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ABSTRACT

This study aimed to the analyze the relationship between the use of mobile devices and video games and students´ perceptions of learning in the Faculty Tourism at the Autonomous University of Sinaloa. A quantitative, nonexperimental, cross-sectional,descriptive-correlational design was uded. The convenience sample comprised 154 students.Data were collected through a questionnaire including sociodemographic and time-use questions, as well as 23Likert-type ítems on digital resources ,learning, and potential adverse effects. Internal consistency was high for both the digital resources and learning scale (a=.942) and the adverse effects scale(a=.877). Overall perceptions of digital resources for learning were moderate (M=3.29,SD=0.69), while perceptions of adverse effects werw lower (M=2.43, SD =0.90). Time spent on social media and video games was not significantly associated with perceptions of learning or adverse effects. A small positive association was found between ordinal academic grade average and perceived learning (p=.212,adjusted p =.042). These findings describe the students in the analyzed sample; they do establish causality and connot be generalized to the entire student population.

Keywords: mobile devices; video games; learning; university students ; tourism.

RESUMEN

El objetivo de este estudio fue analizar la relación entre el uso de dispositivos móviles y videojuegos y la percepción sobre el aprendizaje de estudiantes de la Facultad de Turismo de la Universidad Autónoma de Sinaloa. Se realizó un estudio cuantitativo, no experimental, trasversal y descriptivo-correlacional. Participaron 154 estudiantes seleccionados mediante muestreo no probabilístico por conveniencia. Se aplicó un cuestionario con preguntas sociodemográficas, de uso del tiempo y 23 reactivos tipo Likert sobre recursos digitales, aprendizaje y posibles efectos desfavorables. La consistencia interna fue de alta tanto para el bloque de aprendizaje y recursos digitales (a=.942) como para el de efectos desfavorables (a=.877). La percepción de efectos desfavorables fue menor (M=2.43;DE=0.90). Las horas de uso de redes sociales y videos juegos no representan asociaciones estadísticamente significativas con la percepciones de aprendizaje ni con los efectos desfavorables. Se observó una asociación positiva pequeña entre el promedio académico ordinal y la percepción de aprendizaje (p=.212; p ajustada=.042). Los resultados describen a la muestra estudiada y no permite establecer causalidad ni generalizarse a toda matricula.

Palabras clave: dispositivos móviles ; videos juegos ; aprendizaje; estudiantes universitarios; turismo.

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INTRODUCTION

In recent years, the use of mobile devices and social media by children and adolescents has taken on growing importance in educational and social debates, particularly because of their possible effects on attention, coexistence and learning processes. Faced with this situation, various countries have begun to implement measures to regulate minors' access to digital platforms and to limit the use of mobile phones in educational centers.

In the European context, the president of the European Commission, Ursula von der Leyen, announced a proposal aimed at establishing common criteria to regulate minors' access to social media. According to the information published by(Pérez, 2026), the initiative contemplates applying measures differentiated by age, as well as strengthening the protection of adolescents in digital environments. These proposals respond to concern about the risks associated with excessive use of social media and seek to promote safer digital spaces for children and young people.

The European initiative seeks to harmonize protection criteria among member states, since differences between their laws could translate into unequal levels of protection. It also proposes requiring greater responsibility from digital platforms, through mechanisms to verify the age of their users and the evolution of features that could encourage excessive or compulsive use. Thus, the proposal combines restrictive measures with actions aimed at getting technology companies to assume a more active role in the protection of minors(Pérez, 2026).

In Mexico, the use of mobile phones by girls, boys and young people has become an educational concern, due to the time they spend in front of these devices and the possible interference with their school assignments. In response, limits on use in schools have been proposed to facilitate concentration and favor learning. However, the scope of these measures also depends on their being accompanied by pedagogical strategies that help students use technology responsibly.

On the other hand, Mexico's results in international assessments, including the Programme for International Student Assessment (PISA), show that challenges persist in learning mathematics, reading and science. However, these difficulties cannot be explained solely by mobile phone use, since school performance is associated with personal, family, social and educational factors. It is therefore advisable to examine how digital habits relate to academic performance and to students' learning experiences.

Restrictions on mobile phone use during the school day have also been implemented in other countries and educational systems. In some cases they are partial and in others broader; they are usually justified by the intention of reducing distractions and favoring student participation in academic activities. These measures have opened a discussion on how to integrate technological resources into education while at the same time addressing the effects they could have on the school environment(González, 2026).

In this sense, analyzing the use of mobile devices in education entails observing how much time students use them, for what purpose, and how they relate to their cognitive processes, their academic organization, and the construction of meaningful learning. From Ausubel's approach, it is relevant to consider the conditions that allow new knowledge to be related to the cognitive structures the student already possesses. This perspective makes it possible to understand technology as an educational matter that requires guidance, teaching strategies, and study habits, in addition to considering possible restrictions.

Based on the above, this research analyzes the use of mobile devices in the educational setting and its link with learning processes. The aim is to provide information on students' digital practices and to identify aspects that contribute to a more conscious, balanced use of technology that is appropriate to academic activities.

DEVELOPMENT

The student experience, attention, and the use of mobile devices in the educational context

Phenomenology, student well-being, and academic procrastination offer important approaches for analyzing what students experience in educational spaces. Through them, it is possible to understand that education is not limited to learning content or achieving certain grades, since it is also related to the personal experiences, emotions, perceptions, and behaviors that take part in the learning process. Within this framework, phenomenology makes it possible to explore the meaning students attribute to their school experiences; student well-being encompasses the personal, social, emotional, and academic conditions linked to integral development; and academic

procrastination helps examine the difficulties that arise when school tasks and responsibilities are postponed. Considered together, these perspectives allow a better understanding of phenomena such as motivation, time management, academic performance, participation, and students' continuity at school.

In educational research, the phenomenological method seeks to understand and interpret how people live through a specific situation. When applied, it inquires into the perceptions and opinions of those who participate in the phenomenon, attending to the way they understand it from their own perspective and the context in which it occurs. The analysis makes it possible to describe those experiences and identify the meanings participants assign to them, in order to achieve a deeper understanding of the problem studied(Hernández, 2023).

Attention is a cognitive process essential for learning, since it participates in the selection, processing, and comprehension of information. At school, it allows students to focus their mental resources on a task, sustain concentration, and limit interference from stimuli that could distract them. For this reason, it plays a relevant role in carrying out academic activities and in the construction of knowledge during childhood(Sánchez-Pérez, 2023).

Attention in childhood can be influenced by different factors, both personal and environmental. Individual aspects include neurological maturation, emotions, interest in learning, and the student's capacity to regulate their own behavior. In the environment, the conditions of the school space, teaching methods, the support provided by the family, and contact with technological stimuli can have an influence. The way in which these factors combine can facilitate or interfere with concentration on learning activities. For this reason, they should be kept in mind when studying children's academic behavior (García-Fernández, 2022).

Sustained and selective attention, in turn, are linked to the development of cognitive skills that support learning. Maintaining concentration and distinguishing relevant information can help to understand texts, acquire concepts, and solve problems. In turn, these skills are related to working memory and executive functions, which are involved in planning, behavior control, and the performance of school assignments. Thus, promoting the development of attention can favor academic performance and student participation in various learning spaces(Carreón, 2024).

Today's social and technological changes pose a challenge for education: preparing students who can function in diverse and constantly changing scenarios. To this end, it is necessary to review both curricular content and the pedagogical strategies that facilitate autonomous and consensual learning. It should also be considered that academic performance is not determined solely by intellectual activities; emotional, social, motivational, and cognitive dimensions also play a part. For this reason, teaching must contribute to the comprehensive education of students and to strengthening the capacities that enable them to take charge of their own learning(Entretenimiento, 2021).

At the same time, the evolution of mobile technology has driven the spread of video games and has changed entertainment practices and forms of social interaction. The wide availability of smartphones, together with the variety of games created for these devices, has made it easier for them to be integrated into the daily activities of different population groups. In this scenario, mobile video games occupy a significant place in the digital entertainment industry, both because of the ease of access and because of the experiences they make available to their users(Tépoz and Pérez, 2025).

The expansion of the mobile video game market is also linked to the purchase of digital products associated with games. The acquisition of virtual items – such as aesthetic elements, complementary resources, and functions offered on the platforms – has become a significant economic activity within this sector. This shows that the gaming experience can go beyond entertainment and include consumption decisions related to the interests and motivations of those who play(Syahrizal and Rahayu, 2020).

In the Latin American context, Mexico is an important market for the video game industry. The growth in users and in spending on this type of entertainment reflects the expansion of the sector, which also includes games played on mobile devices. Against this backdrop, it is pertinent to study which factors influence consumption decisions, especially among those who play massively multiplayer online role-playing video games (MMORPG). With this objective,(Piedras, 2023) proposes to examine variables from the theory of planned behavior (TPB) and from the extended version of the unified theory of acceptance and use of technology (UTAUT2), in order to determine how they relate to the purchase intention of Mexican players and of players from other Latin American countries.

On the other hand, the influence of other people may vary depending on the type of digital consumption decision. In some cases, the intention to compare virtual products seems to be linked

more to the user's tastes, the value they recognize in the product and the satisfaction they expect to obtain than to the approval of their environment. This perspective underscores the advisability of attending to individual motivations when analyzing players' behavior and their purchase decisions in digital spaces(Muharam, HarjumPangestuti and Demi, 2025).

Student well-being and use of electronic devices

Student well-being in relation to the use of digital technologies has aroused growing interest in the educational field, due to the need to understand how habitual exposure to electronic devices may be linked to students' health and integral development. Various studies have begun to explore the possible physical, emotional and cognitive effects of prolonged use of these tools, especially among those who resort to them daily to study and for entertainment. Along these lines,(Orrala, 2025)analyzes the implications of the use of technological devices for the health of the student community, and reports discomforts associated with vision, sleep and hearing, among others. Likewise, it highlights the importance of paying attention to these symptoms and of promoting preventive measures that favor a responsible use of technology.

This panorama poses a challenge for education, particularly because habits of electronic device use may begin to form during childhood and adolescence. Habitual exposure to screens may occur together with difficulties in concentrating, resting and organizing school assignments; therefore, it is pertinent to study how these aspects could relate to learning. Prevention, in turn, requires the collaboration of educational institutions, teaching staff and families to foster healthy digital habits from the earliest stages of education.

Addressing this situation in a timely manner would make it possible to recognize possible risks and design strategies that contribute to the well-being of students during their academic trajectory.

Prolonged use of electronic devices may be accompanied by physical discomfort, such as visual fatigue, headache and discomfort in the back, neck or wrists. These manifestations could be associated with screen exposure time, inadequate postures and the absence of breaks during use. Likewise, difficulties falling asleep may arise, particularly when these devices continue to be used close to rest time. Given these possible manifestations, it is important to consider how long screens are used, ergonomic conditions and the digital habits of students. However, both the presence and the intensity of the discomfort must be assessed in each case without attributing them solely to the use of technology.

In higher education, this topic becomes relevant because students turn to electronic devices to search for information, complete academic activities, communicate and be entertained. Although these tools can expand learning possibilities, their use without adequate guidelines may coincide with habits that affect rest, concentration and overall well-being.

This is why it matters to examine the technological practices of university students and to explore their possible links with their physical, emotional and cognitive health, taking into account the particularities of their academic context.

Based on this background, the present research aims to analyze the relationship between the use of video games and electronic devices and the physical, emotional and cognitive health of university students at the Faculty of Tourism of the Universidad Autónoma de Sinaloa. From this analysis, the aim is to generate information that contributes to understanding the technological habits of this population and to identifying areas of opportunity to promote student well-being, the prevention of possible adverse effects and to favor a more balanced use of digital resources in the educational setting.

Theoretical foundation: David Ausubel's meaningful learning theory

This research is grounded in the meaningful learning theory of(David Ausubel, 1963), according to which the incorporation of new knowledge depends to a large extent on the way in which the student relates it to previously acquired knowledge. From this approach, learning goes beyond memorizing information, since it implies understanding it and integrating it into the cognitive structure, establishing relationships that allow interpreting, explaining and applying what has been learned in different situations.

In the contemporary educational context, where digital technologies are part of everyday life, this theory allows examining how students' prior knowledge interacts with the use of electronic devices in academic activities. Children and young people who have grown up in digital environments may have developed experiences, skills and ways of relating to information that influence their ways of learning. However, this does not mean that using technology automatically produces

meaningful learning, nor that doing without it necessarily generates a cognitive disconnection. Its educational contribution depends on the way in which it is used and on its articulation with teaching purposes, didactic strategies and the needs of the student body.

Ausubel's proposal allows us to understand the importance of establishing links between the knowledge students already possess and new content. When these connections are appropriate, students can reorganize their ideas, broaden their frameworks of understanding, and construct more complex meanings. In this way, learning does not consist solely of incorporating information, but also of developing knowledge that can be recalled and applied in different contexts. Learning strategies play an important role in this process, since they favor the organization of information, the retrieval of prior knowledge, and the incorporation of new concepts, elements that can contribute to the development of critical thinking(Arteaga, 2024).

From Ausubel's cognitive perspective, teaching must begin with the identification of the knowledge students possess. This knowledge forms a cognitive structure made up of concepts, propositions, experiences, and interpretations, which serves as a basis for understanding the information presented subsequently. It can facilitate the acquisition of new knowledge when it allows pertinent relationships to be established; however, it can also hinder it if it contains erroneous ideas or interpretations that obstruct the understanding of new content.

Therefore, when planning teaching, it is advisable to identify, as far as possible, the knowledge and experiences students have regarding the topic to be addressed. Based on this information, the teacher can select content, resources, and pedagogical strategies that facilitate the relationship between existing knowledge and new knowledge. This perspective recognizes that students arrive in the classroom with diverse backgrounds and levels of knowledge, so their characteristics and needs must be considered during the educational process.

Along these lines,(Moreira, 2020)points out that meaningful learning occurs when new knowledge is integrated substantially and non-arbitrarily into the cognitive structure of the learner. This implies that students do not merely repeat information, but understand it, can explain it, and know how to use it in different situations. Consequently, teaching should ensure that content is understood in a lasting way and can be applied, instead of focusing exclusively on rote memorization or preparation for assessments.

For this research, the theory of meaningful learning provides a framework for analyzing students' use of electronic devices and the possible relationship between their technological experiences and their academic activities. These resources can facilitate the search for information, the consultation of materials, and the completion of tasks. At the same time, it is important to explore whether certain usage habits are related to difficulties in maintaining attention, organizing time, or completing school activities. To this end, it is necessary to distinguish between academic and recreational use, as well as to consider the purpose, frequency, and circumstances in which electronic devices are used.

Thus, the contribution of Ausubel's theory consists in offering a perspective for understanding learning based on prior knowledge, the construction of meanings and the incorporation of new information. Its application guides reflection on the pedagogical conditions that can favor the educational use of technology, without assuming in advance that mobile devices are positive or negative in themselves. In this way, the aim is to broaden the understanding of students' technological habits and their possible links with learning processes and academic development.

The phenomenology of the use of digital technologies in the educational field

The presence of electronic devices in educational spaces poses challenges that go beyond access to technology, since it also involves teachers' perceptions and experiences. In this context, fear or lack of confidence regarding digital tools can influence the way teachers incorporate them into their pedagogical practice. Some may consider that cell phones and computers hinder group control or alter traditional teaching dynamics, instead of recognizing them as resources that could complement learning if used with appropriate guidance.(Montero and Lugo, 2026)examine this situation based on teachers' experiences and the tensions between students' digital culture and the educational practices developed in the classroom.

Resistance to the use of technological resources may be related to teachers' professional training, institutional conditions and the lack of pedagogical guidance. When educators do not have sufficient preparation to use these tools for didactic purposes, they may face difficulties in incorporating them appropriately into teaching. For this reason, training should not be limited to the technical handling of devices, but should also develop pedagogical and reflective criteria to assess their possibilities, limitations and risks. The challenge consists in promoting educational

practices that respond to social and technological changes without losing sight of the formative purposes of the school.

Likewise, the lack of opportunities for digital literacy in educational institutions can accentuate inequalities among students, especially when there are differences in the learning possibilities they have in their homes and communities. At the preschool level, contact with technologies requires planning in accordance with children's age, their development and the pedagogical objectives(-Murillo and González, 2022)allow this debate to be situated in relation to educational inequalities and the obstacles that can limit the use of technological resources. From this perspective, their incorporation should not depend solely on the teacher's personal preferences, but also on the student's needs, the conditions of each institution and the right to receive a relevant and equitable education.

In this sense, analyzing teachers' experiences and the meanings they attribute to technology is important for understanding how they are incorporated into schools. Although many children and young people have contact with digital devices from an early age, knowing these tools does not necessarily mean knowing how to use them for educational purposes or to critically evaluate the available information. Therefore, it is up to schools to take part in students' experiences and transform them into learning opportunities through activities that promote analysis, reflection and the construction of knowledge.(Mendoza, 2026)proposes examining the relationship between childhood digital experiences and the possibilities of making use of them in the educational process.

From a phenomenological perspective, human experiences are studied on the basis of the meanings that people construct when relating to their environment. Within this framework, Waldenfels's responsivity approach makes it possible to consider how people respond to situations, demands and events that challenge their usual ways of understanding the world. In the educational field, this perspective allows us to inquire how teachers and students face technological changes, what concerns these generate in them and how they respond to the new demands of the digital society. Therefore, reactions of fear, uncertainty or acceptance must be understood in relation to the personal experiences, social practices and institutional conditions that shape them, rather than analyzed in isolation(Waldenfels, Bravo and Rodríguez-Martín, 2025).

The growing presence of mobile devices and video games also raises questions about the place they occupy in young people's daily lives. Some digital content includes violent scenes, presents the rapid attainment of economic success or shows lifestyles centered on consumption and the display of goods. Similarly, social media circulate idealized images of wealth, recognition and personal fulfillment that do not always reflect the circumstances behind those representations. It is therefore pertinent to study how young people interpret this content and how they distinguish between digital representations and everyday situations. However, its possible effects may vary according to age, the type of content, exposure time, adult guidance and the characteristics of each student. In the educational field, one of the main challenges is to ensure that recreational use of devices, or use lacking clear limits, does not hinder academic tasks, rest, coexistence or the development of cognitive and social skills. This does not imply attributing a harmful character to all digital interaction, but rather recognizing the importance of developing capacities to use technology in a balanced, responsible and critical manner. Schools can help students examine the information they receive, question the messages disseminated on digital platforms and build criteria to distinguish reliable content from fictitious representations and from behaviors that may be harmful in social life.

Against this backdrop, it is essential that educational authorities, schools, teachers and families participate in a coordinated manner. Guidance on the use of electronic devices can begin in basic education and continue at the upper secondary and university levels, in accordance with the needs of each educational stage. Actions to consider include training in digital citizenship, family support, teacher training and the establishment of clear agreements on the use of technology. Taken together, these actions can contribute to the development of autonomy, critical thinking and responsibility in students' digital interactions. Therefore, studying the excellences related to the use of electronic devices from a phenomenological perspective allows this problem to be approached from the perspectives of the people involved in education. Knowing how students understand digital content, how teachers face its incorporation into the classroom and how families guide the use of technology can provide elements to formulate educational strategies consistent with these experiences. The purpose is not to restrict technology or to promote its indiscriminate use, but to recognize the conditions that allow it to be used for educational purposes and to favor the well-being and integral development of students.

Academic procrastination and mobile device dependence in university students

Academic procrastination consists of repeatedly postponing school tasks and obligations without a justified reason, even when the student is aware of the possible unfavorable consequences of this decision. In addition to hindering the fulfillment of academic activities, this behavior can be accompanied by anxiety, worry, frustration and personal dissatisfaction. It involves cognitive, emotional and behavioral dimensions that influence decision-making, especially when the student must choose between attending to academic responsibilities or carrying out activities that offer immediate gratification(Castillo and María, 2025).

Among the aspects related to academic procrastination are self-regulation and the postponement of activities. The first implies that the student establishes goals, monitors their progress and manages their thoughts, emotions and behaviors in order to meet their learning objectives. Postponement, for its part, becomes evident when school responsibilities are repeatedly left for later, even when there are conditions to carry them out. These difficulties can be related to anxiety, a lower perception of one's own ability and greater stress regarding the possibility of not meeting academic demands.

Various factors may play a role in academic procrastination, such as difficulties in managing time, low self-control, self-regulation problems, uncertainty, perfectionism and previous learning experiences. Family relationships and parenting styles may also have an influence. Among the consequences associated with this behavior are increased stress, attention difficulties, low academic performance and, in certain cases, the risk of failing or dropping out of university studies. For this reason, knowing the factors involved in the postponement of school assignments is relevant for proposing strategies that promote autonomy and academic responsibility (Vacacela et al, 2023)

In this context, the use of mobile devices is an aspect of interest for analyzing students' habits and behaviors. Cell phones make it possible to carry out academic activities, search for information, communicate and access entertainment content. However, when their use frequently interferes with school obligations, it can become a distraction and hinder time management and task completion. This phenomenon deserves attention during adolescence and youth, stages in which mobile devices are often used to interact with other people, to be entertained and to take part in educational activities.

The increase in cell phone use became especially evident during the COVID-19 pandemic. In that period, these devices made it possible to maintain communication and continue school activities at a distance. At the same time, their intensive use highlighted the importance of distinguishing between the academic use of technology and those habits that could interfere with concentration or rest. Therefore, to analyze frequency of use it is also necessary to consider the purpose for which the phone is used, the context and the degree of control that students exercise over their digital activities.

When cell phone use is constant and difficult to regulate, it may present characteristics of problematic use and be related to difficulties in different areas of daily life. The literature has reported associations between this pattern and factors such as self-esteem, self-regulation, social skills, well-being and academic performance. However, these associations do not allow concluding that the device directly causes such difficulties, since personal, social and educational circumstances may also play a role (Viera et al; 2023).

Mobile phone dependence may manifest as the need to check the device frequently, difficulty limiting the time devoted to it, and the persistence of this behavior despite its possible unfavorable consequences. Factors that could favor problematic use include practices learned in the family, difficulties in establishing face-to-face bonds, and problems managing emotions. In addition, digital applications offer frequent stimuli and immediate gratifications, elements that may encourage the repetition of certain behaviors. For this reason, it is advisable to investigate not only how much time students spend on the phone, but also what needs they seek to satisfy through its use and what difficulties they face in regulating it.

The possible relationship between academic procrastination and cell phone use can be examined through the search for relief and immediate gratifications. When faced with a school task that produces boredom, uncertainty, frustration, or anxiety, some students might turn to the phone to distract themselves and temporarily reduce those sensations. Although this may provide momentary relief, it can also delay the start or completion of academic activities. If this pattern is repeated, the time available to attend to obligations could be reduced and worry, stress, or dissatisfaction with the results obtained could subsequently increase.

In this sense, the phone can compete with academic tasks for the student's time and attention, especially when recreational applications offer immediate rewards and seem to require less

effort than some school activities. However, the relationship between the two phenomena may vary according to personal characteristics, study practices, self-regulation capacities, and the circumstances in which the devices are used. Hence the importance of empirically testing whether problematic cell phone use is associated with the postponement of academic responsibilities, without assuming that a cause-and-effect relationship necessarily exists.

In the university setting, studying these behaviors is relevant because students need to develop greater levels of autonomy, organize their activities, and respond to demands that require planning and perseverance. Difficulty regulating phone use, combined with the tendency to postpone tasks, can complicate time management and the fulfillment of educational objectives. Analyzing the relationship between the two phenomena would allow a better understanding of study habits and help identify areas in which actions could be developed to strengthen self-regulation and the responsible use of technology.

Based on this background, the general objective of this research was to determine the relationship between academic procrastination and mobile device dependence in university students of the Faculty of Tourism of the Universidad Autónoma de Sinaloa. The analysis aims to provide information on the association between both phenomena and to help identify strategies that contribute to organizing time, regulating digital habits, and favoring the academic development of students.

METHODOLOGY

Design and scope

A quantitative, nonexperimental, cross-sectional study with a descriptive–correlational scope was conducted. The analysis used a database of 154 responses from students of the Faculty of Tourism of the Universidad Autónoma de Sinaloa. The cross-sectional and observational nature allows the responses to be described and associations between variables to be examined, but does not allow temporality or causality to be established,

Participants and context

The target population consisted of students in the Tourism Program of the Universidad Autónoma de Sinaloa. According to the official enrollment reported in the statistical yearbooks of ANUES, the program had 301 students(ANUES, 2025); for the planning of the study, a base of 293 students was used. With this latter figure, a minimum sample of 167 students was estimated, under the parameters of 95% confidence and 5% error. During the fieldwork, a difference was identified between the official enrollment and the academically active student body, attributed to inactivity, absenteeism, or dropout. The analytical sample consisted of 154 students who met the criteria of being enrolled in the program and forming part of the active enrollment at the time of administration. It was reported that this number approximated the actual active enrollment; however, since the exact total of active students was not available, it is not possible to calculate the corresponding coverage.

We used nonprobabilistic convenience sampling, because an individualized, refined sampling frame was not available. After data cleaning, 154 records were retained with no duplicates and no missing values in the substantive items. The 23 Likert items had responses in all 154 records; however, some missing data were observed in age and in the hours variables, so n varies between analyses. The estimate of 167 participants was used as a planning reference: since this is a convenience sample, the confidence and error parameters are not guaranteed by the design, and the results are not statistically generalizable to the official enrollment.

Instrument and variables

23 statements with five-category Likert-type response options were analyzed: never, almost never, sometimes, almost always, and always. 19 items addressed the use of digital resources and their perceived relationship with learning; within this block, 4 items referred specifically to video games. The remaining 4 items measured possible perceived negative effects, such as interruptions, distraction, reduced study time, and interference with academic responsibilities. The database also included age, sex, semester, grade point average, and declared hours of general use, social media / video games and academic study.

Likert responses were coded from 1 (never) to 5 (always). Average scores were calculated for

the block of 19 items, the block of four negative effects, and the subset of four items on video games. Grade point average was organized ordinally into three categories: 7.0–7.9, 8.0–8.9, and 9.0–10.0. Hours were analyzed as recorded; the time period to which they refer should be confirmed with the original questionnaire question.

Analysis procedures

Frequencies and percentages were calculated for categorical variables; for age and hours, the mean, standard deviation, median, quartiles and range were obtained. The internal consistency of the item blocks was estimated using Cronbach's alpha. To explore associations, Spearman's rho correlation was used between hours of social media / video games, study hours, ordinal average and the learning or perceived effects scores. Five associations were evaluated and their p-values were adjusted using the Holm procedure; a significance level of 0.05 was taken as a reference. The number of observations varied between analyses because of missing data in some variables.

Cronbach's alpha is interpreted as an indicator of internal consistency for this sample, not as proof of validity of unidimensionality. Likewise, the scores represent self-reported perceptions, not direct measurements of learning or academic performance.

RESULTS

Characteristics of the sample

The sample consisted of 154 records of Tourism students in face-to-face modality. A total of 114 women (74.0%), 38 men (24.7%) and two people who preferred not to indicate their sex (1.3%) responded. The average category of 9.0 to 10.0 grouped 98 students (63.6%); 51 (33.1%) were between 8.0 and 8.9, and five (3.2%) between 7.0 and 7.9.

Table 1. Characteristics of the sample

Variable	Category	n	%
Sex	Woman	114	74.0
	Man	38	24.7
	Prefer not to say	2	1.3
Semester	First	41	26.6
	Third	45	29.2
	Fifth	31	20.1
	Seventh	37	24.0
Average	7.0–7.9	5	3.2
	8.0–8.9	51	33.1
	9.0–10.0	98	63.6

Note. N = 154. All records corresponded to Tourism students in the face-to-face modality.

Age and reported hours

Mean age was 20.94 years (SD = 4.53; n = 152), with a median of 20 years and a range of 17 to 47. In reported hours, mean general use was 7.40 (SD = 4.52; n = 153); for social media and video games it was 4.76 (SD = 3.92; n = 150); and for academic study it was 2.67 (SD = 1.73; n = 151). Median use of social media/video games was 3.5 hours and that of academic study, 2 hours. The interpretation of the period (per day, week or other) depends on the original wording of the questionnaire.

Frequency of Likert responses

When the responses to the 19 items on digital resources and learning were grouped (2,926 item responses), the most frequent category was Sometimes (42.2%), followed by Almost always (27.8%). In the four items on negative effects (616 item responses), 38.5% corresponded to Sometimes; Never and Almost never together accounted for 48.7% of the responses. These percentages describe accumulated item responses, not percentages of students.

Table 2. Descriptive statistics for age and reported hours

Variable	n	M (SD)	Median [Q1, Q3]	Min.–Max.
Age (years)	152	20.94 (4.53)	20 [19, 21]	17–47
General use (hours)	153	7.40 (4.52)	6 [5, 9]	1–24
Social media/video games (hours)	150	4.76 (3.92)	3.5 [2, 6]	0–24
Academic study (hours)	151	2.67 (1.73)	2 [2, 3]	0–12

Note. M = mean; SD = standard deviation; Q1 and Q3 = first and third quartiles. The time period to which the hours refer must be specified.

Table 3. Cumulative distribution of responses by block

Block	Response	n of responses	%
Digital resources and learning (19 items)	Never	200	6.8
	Almost never	307	10.5
	Sometimes	1,234	42.2
	Almost always	812	27.8
	Always	373	12.7
Perceived negative effects (4 items)	Never	151	24.5
	Almost never	149	24.2
	Sometimes	237	38.5
	Almost always	56	9.1
	Always	23	3.7

Note. Percentages were calculated on responses to items: 2,926 for the block of 19 items and 616 for the block of four.

Scores and internal consistency

The mean score for the digital resources and learning block was 3.29 (SD = 0.69; median = 3.21), whereas that for the negative effects block was 2.43 (SD = 0.90; median = 2.50). Cronbach's alpha was .942 for the 19 items of the first block and .877 for the four items on negative effects. Both values indicate high internal consistency in this sample. In the video games subset, the means of the four items ranged from 2.56 to 2.67, below the overall mean of the first block; this suggests less frequent responses to the favorable statements about their academic use.

Correlations

Hours of social media/video games showed no statistically significant associations with perceived learning with digital resources (rho = −.054, adjusted p = .510) or with perceived negative effects (rho = .057, adjusted p = .492). Nor was an association observed between those hours and the specific score for learning through video games (rho = −.004, adjusted p = 1.000). The relationship between hours of academic study and perceived learning was positive, but it did not reach statistical significance after adjustment (rho = .157, adjusted p = .217).

Table 4. Scores and internal consistency of the blocks

Block	Items	n	M (SD)	α
Digital resources and learning	19	154	3.29 (0.69)	.942
Perceived negative effects	4	154	2.43 (0.90)	.877

Note. Average scores on a scale from 1 to 5. α = Cronbach's alpha. The video games subset corresponds to items 5–8 of the learning block.

The only association that remained statistically significant after Holm adjustment was the positive relationship between the ordinal grade category and perceived learning with digital resources (rho = .212, adjusted p = .042). The magnitude was small; it is therefore interpreted as a modest association, not as evidence that the use of digital resources caused a higher grade.

Table 5. Spearman correlations

Association	n	rho	p	adjusted p (Holm)
Social media/video game hours – learning through video games	150	−.004	.959	1.000
Social media/video game hours – perceived learning	150	−.054	.510	1.000
Social media/video game hours – perceived negative effects	150	.057	.492	1.000
Study hours – perceived learning	151	.157	.054	.217
Ordinal average – perceived learning	154	.212	.008	.042

Note. rho = Spearman's rho coefficient. The Holm adjustment was applied to the family of five correlations. Significance was assessed with adjusted $p < .05$.

CONCLUSIONS

In this case study, students reported a use of digital resources that is moderately frequently related to learning activities. Searching for information for courses was one of the most frequent practices (item P01: approximate mean = 3.83 on the scale from 1 to 5). By comparison, favorable statements about the use of video games to apply knowledge, solve problems, make decisions or practice content obtained means of 2.56 to 2.67. Therefore, the results describe a more favorable assessment of digital devices and resources in general than of video games as academic support.

Although almost half of the responses recorded for the four items were concentrated in the Never and Almost never options, a considerable proportion of participants indicated that these situations occurred Sometimes. Among the effects assessed, the highest mean corresponded to the perception that excessive mobile phone use reduces the time available for studying (E03; approximate mean = 2.65). Taken together, these results suggest considering both the educational possibilities of devices and the distractions associated with their use, without attributing to them by themselves a deterioration in academic performance.

The hours devoted to social media and video games did not show a statistically significant association with perceived learning scores or with negative effects scores. In contrast, the categorized school average presented a small positive association with perceived learning. Therefore, the data do not support a direct and uniform relationship between time spent on social media or video games and the perception of learning. Given the scope of the study, these findings should be interpreted as exploratory and referring to the participants in the Tourism program; they do not allow generalizing conclusions to students in other degree programs or institutions.

To broaden the evidence, it would be advisable to include students from other semesters or programs and to distinguish between educational, academic and recreational use time of devices. Examining the structure of the instrument is also recommended, since a high alpha coefficient is not enough to demonstrate that its 19 items make up a single dimension. A factor analysis, together with other validity evidence, would allow assessing whether mobile phone use, perceived learning and educational use of video games should be treated as differentiated constructs.

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CONFLICT OF INTEREST

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