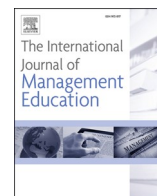


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Maximizing student satisfaction in education: Instagram's role in motivation, communication, and participation

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ABSTRACT

Educators from various disciplines are using interactive components and brief videos in social media to create engaging and effective learning experiences. This study examines the integration of Instagram in higher education, focusing on short videos to teach economic concepts. Although social media's potential to enhance learning is recognized, there is limited understanding of its impact on communication, participation, and motivation among students. This research fills this gap by exploring the most effective ways to use Instagram to improve these aspects, aiming to increase student satisfaction.

We present an exploratory theoretical model and test it on 338 Business Administration students. Using structural equation modeling with partial least squares (PLS-SEM), we analyze the relationships between Instagram usage, communication, participation, and motivation as predictors of student satisfaction. This approach is relevant for educators seeking to enhance student engagement through digital methods and offers a framework for further research. The findings reveal a significant correlation between Instagram usage and improved communication, participation, and motivation, leading to higher student satisfaction. This study contributes to the literature by providing empirical evidence of Instagram's positive impact on learning experiences and offers a theoretical model to guide future research and strategy development in educational settings.

1. Introduction

The impact of the COVID-19 pandemic on education has been profound and long-lasting. School and higher education institutions' closures and the abrupt transition to remote learning have permanently changed education (Antunes & Barreto, 2022). While some students have returned to classrooms in 2021, distance learning remains a popular option (Pregowska et al., 2021). Higher education institutions have adapted their administrative processes and structures to align with new modes of education that meet current societal needs (Salinas, 2004). To create conditions for the development of learning and adaptation capabilities, teaching and learning systems in virtual environments have been established, representing a pedagogical innovation process (Fullan, 2015).

Advancements in Information and Communication Technologies (Navío-Marco et al., 2024) have a significant impact on education, as they are used to create computer-assisted learning environments and new teaching proposals based on collaborative work

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(Szymkowiak et al., 2021). Social media has become a popular methodological approach in recent years (Kinsky et al., 2016). It has been suggested that social media not only facilitate classroom connections and conversations but also have the potential to enhance learning (Tess, 2013). Social media are appealing to students as they bridge their private and academic lives and facilitate communication (Rodríguez Revelo et al., 2021). Platforms such as YouTube, Instagram, Twitch, or TikTok can be interesting and interactive means of learning, where students can share learning materials in the form of video tutorials (Septiantoro & Widaningsih, 2022). Social media also play a significant role in the effectiveness and efficiency of learning activities (Ansari & Khan, 2020).

According to the Qustodio (2021) report, there is a significant gap in the use of technology in education between countries. In Spain, over 40% of parents reported that their children did not use electronic devices in the classroom as part of their education, compared to 29% in the United Kingdom (UK) and only 14% in the United States (US). Furthermore, in the US, most children received their own school device (60%), whereas in Spain and the UK, fewer than 50% of children had access to a device that they could take home from school. Technology can be a powerful tool to enhance education, but its impact depends on how it is implemented and used (Szymkowiak et al., 2021). Naslund et al. (2020) outline several benefits and risks of social networks for young people. Social networks offer connection, support, and access to information, but they also pose risks such as exposure to negative content and digital dependence (Kircaburun & Griffiths, 2018; Masrom et al., 2023). It is crucial to balance the potential benefits with privacy and safety concerns when considering their use in mental health interventions (Balcombe & De Leo, 2021).

In the digital age, where social media has become an integral part of students' lives, it is essential to explore new ways to use these platforms as educational tools (Al-Rahmi et al., 2022; Blair & Serafini, 2014). University professors in Economics and Business Sciences play a crucial role in creating educational content to be shared on this popular platform. The main aim of this paper is to explore and understand the effects of integrating Instagram as a dynamic and captivating educational tool for teaching economic concepts to students in higher education, specifically focusing on the use of short videos for this purpose. The creation of video content as a student assignment has been demonstrated to facilitate the development of skills at the post-secondary level (Fang & Chiu, 2024). Furthermore, it seeks to demonstrate the strategic potential of Instagram in fostering enhanced communication, participation, and motivation among students, which ultimately contributes to increased satisfaction. Specifically, the utilisation of Instagram in higher education has been demonstrated to enhance motivation and facilitate the acquisition and transmission of content, which has a positive effect on the educational process (Fernández-Cerero & Montenegro-Rueda, 2024). Recognizing the importance of quality content, university professors are actively involved in creating content to ensure its relevance and academic rigor (Moghavvemi et al., 2018). Nevertheless, there is a continued necessity for educators and academic institutions to enhance their utilisation of these platforms and fully leverage their potential (Zachos et al., 2018).

The choice of Instagram as an educational platform is based on its wide reach and popularity among young students. Instagram is the fastest growing, recently reaching 1 billion active users (Statista, 2018). However, there are very few studies investigating its effectiveness as an educational platform for language learning (Mansor & Rahim, 2017) or the use of other social platforms, such as Twitter, in undergraduate students (Osgerby & Rush, 2015). Erarslan (2019) argues that the intensive use of social media as part of students' daily lives (which indeed began with the introduction of Web 2.0 technology) could be effectively used for educational purposes, especially in higher education contexts. Furthermore, students who had positive perceptions of Instagram's ease of use and utility as an effective learning tool showed relatively high motivation (Min & Hashim, 2022).

A comprehensive understanding of the specific impact of social media on communication, participation, and motivation among students remains elusive. This research addresses the aforementioned gap by investigating the most effective ways of utilizing Instagram to promote communication, participation, and motivation, with the ultimate goal of increasing student satisfaction. In this article, we employ the MOA theory (Motivation-Opportunity-Ability) (Blumberg & Pringle, 1982; Lai et al., 2018) to examine the potential of utilizing Instagram in higher education to enhance student communication, participation, and motivation, which may ultimately lead to increased satisfaction. In this study, we apply the MOA theory to a novel context: the use of Instagram to teach economic concepts in higher education. This approach not only permits the practical implementation of the theory in a contemporary, digital setting but also prompts a re-evaluation and expansion of the theory by taking into account the distinctive characteristics of online learning and digital tools.

The research is structured as follows. Section 2 outlines the literature review, while sections 3 and 4 detail the methodology and results, respectively. Section 5 provides a discussion of the findings in relation to recent literature. Finally, section 6 presents the conclusions, highlighting the theoretical and practical implications, as well as the identified limitations and suggestions for future research.

2. Literature review and hypothesis development

2.1. Theoretical framework

There is a need to investigate which factors influence students' behavior with the incorporation of Instagram as an educational tool. In this study, a MOA theory (motivation-opportunity-ability theory) is applied to explore students' behavioral intention in training with Instagram. The theory of Motivation-Opportunity-Ability (MOA) relates the concepts of effective communication, commitment, intrinsic motivation, and satisfaction, applicable to the educational field (Blumberg & Pringle, 1982; Lai et al., 2018). In fact, this theory has already been successfully used in the field of higher education to analyze student engagement (Jepson & Ryan, 2018). This theory posits that specific behaviors are primarily influenced by individual characteristics, including motivation and ability, as well as the external environment or opportunity. "Motivation" relates to behaviors driven by an individual's values and beliefs, "ability" refers to behavioral decisions constrained by available resources and knowledge, and "opportunity" involves behaviors constrained by the

external environment (Lai et al., 2018). The following table synthesizes some of the recent findings on MOA theory in education (see Table 1):

The MOA (Motivation-Opportunity-Ability) theory plays a pivotal role in all four studies, providing a robust theoretical framework for understanding and analyzing human behavior across various educational and social contexts. In Xie et al.'s (2023) study, the MOA theory is employed to investigate the intentions of pre-service teachers for AI-integrated instruction, allowing for the identification of how motivation, opportunity, and ability influence their behavior. In Qu and Wang's research (2023), the MOA theory aids in understanding how the motivations and abilities of college students impact the branding of voluntary service, enabling the proposal of measures to enhance these efforts. In Xu and Zhao's (2024) study, the MOA theory is utilized to examine the factors influencing vocational literacy among higher vocational students, emphasizing the significance of considering motivation, opportunity, and ability in this process. Finally, in Qiu and Li (2024) investigation, the MOA theory is integrated with self-determination theory to explore academic dishonesty in Chinese higher education, aiding in understanding how motivation, opportunity, and ability shape students' decisions. Collectively, these studies underscore the importance of the MOA theory as a valuable conceptual framework for comprehending and addressing a variety of educational and social phenomena.

Such theory (MOA) could be relevant in this study by analyzing how students' motivation to engage in education through Instagram, the opportunity provided by this platform to communicate and interact, and the skill they develop in creating content in the form of short videos, influence their satisfaction with the learning experience. This theoretical approach could provide a solid framework for understanding how the use of Instagram promotes student engagement and motivation, leading to greater satisfaction with the educational process. In addition to applying the MOA theory, our study integrates perspectives from self-efficacy theory (Bandura, 1997) and collaborative learning theory (Dillenbourg, 1999; Oswald & Zhao, 2021). By integrating these theoretical perspectives, we can gain a more comprehensive understanding of the impact of digital platforms on student performance and satisfaction. The tenets of self-efficacy theory posit that an individual's self-efficacy, or belief in their own capabilities, exerts a significant influence on their academic performance. This is because self-efficacy affects an individual's persistence, effort, and self-regulation, which in turn contribute to enhanced learning outcomes (Bandura, 1999; Graham, 2022). The self-efficacy theory provides a complementary perspective to the MOA theory by examining the influence of students' confidence in their digital skills on their motivation and participation. Concurrently, collaborative learning theory (Oswald & Zhao, 2021) reinforces our emphasis on the paramount importance of interaction and collaboration in digital educational environments. This theory illustrates how collaborative learning processes facilitate skill development, the creation of new ventures, and the promotion of innovation (Oswald & Zhao, 2021).

Table 1
Recent reviews on MOA theory in education.

Reference	Objective	Methodology	Key findings
Xie et al. (2023)	The objective of the study is to investigate pre-service teachers' self-reported intention for artificial intelligence (AI)-integrated instruction based on the MOA (motivation-opportunity-ability) theory.	The study utilizes a quantitative approach to examine the direct effects of intrinsic and extrinsic motivation on pre-service teachers' behavioral intention for AI-integrated instruction.	Both intrinsic and extrinsic motivation positively influence pre-service teachers' intention to use AI-integrated instruction. Motivation mediates the relationship between facilitating conditions and perceived self-efficacy. This framework helps educators develop effective teacher-training curriculums focused on AI-integrated instruction.
Qu and Wang (2023)	The study aims to explore how college students' motivations and abilities impact the brand-building of voluntary service, emphasizing their role in the sustained development and effectiveness of these efforts in promoting social welfare.	The study utilizes a questionnaire survey (PLS) conducted among 254 college student volunteers in a city. Employing the MOA perspective, the researchers analyze the relationship between college students' motivations, abilities, and brand-building of voluntary service.	Psychological motivations, government policies, and professional abilities positively influence the brand-building of voluntary service among college students. The study offers actionable countermeasures and suggestions for enhancing brand-building efforts, encompassing three key aspects: incentive mechanisms, guarantee mechanisms, and training mechanisms.
Xu and Zhao (2024)	This study aims to explore the factors influencing vocational literacy among higher vocational students in the modern service industry.	The study uses MOA theory to create hypotheses around motivation, opportunity, and ability. It applies multiple linear regression to analyze vocational literacy's influencing factors, with regression coefficients.	The study underscores the importance of deeply exploring students' motivation for learning and enhancing their learning environment to improve vocational literacy among higher vocational students in the modern service industry under the MOA theory framework.
Qiu and Li (2024)	The objective of this study is to investigate the factors influencing academic dishonesty during thesis writing in Chinese higher education, integrating self-determination theory (SDT) and the motivation-opportunity-ability (MOA) model.	The study utilizes qualitative interviews with students majoring in tourism and hospitality to explore the relationship between self-determination theory and academic dishonesty. The research integrates SDT's focus on intrinsic motivation and satisfaction of psychological needs with the MOA model.	Students with lower self-determination, marked by a lack of autonomy, competence, and relatedness, exhibit limited ethical behavior in completing thesis tasks. Motivation for academic dishonesty, driven by frustration in ability and opportunity, results in immoral behavior in thesis writing. The study underscores the complex interplay of motivational and contextual factors influencing academic dishonesty.

2.2. The use of Instagram and its short videos in education

One of the distinctive features of Instagram is its short videos, known as “Reels,” which allow users to record and edit videos of up to 60 s in duration (Menon, 2022). This feature has gained popularity due to its ability to tell stories in a concise and visually appealing manner. In addition to Reels, Instagram also offers the “Stories” feature, allowing users to share photos and videos that disappear after 24 h. This feature has encouraged creativity and spontaneity, as users can add filters, text, stickers, and special effects to their stories to make them more eye-catching and entertaining (Kim et al., 2017). Instagram has also implemented interactive features such as polls, questions, and sliders, which enable users to engage with other users’ posts and promote interaction and engagement (Richter et al., 2022). These features are particularly relevant in the educational context, as they allow teachers and students to participate in online debates and discussions.

The platform offers a wide range of editing tools and filters that allow users to enhance the appearance of their photos and videos, contributing to the creation of visually appealing and high-quality content (Kim et al., 2017). In terms of accessibility, Instagram is available on both mobile devices and the web version, allowing users to access the platform from different devices and at any time and place. This has contributed to its popularity and its extensive user base worldwide (Choi & Sung, 2018).

Finally, Instagram enables the creation of educational communities where teachers and students can connect, interact, and share resources and ideas (Handayani, 2015). Instagram can serve as a valuable complement to traditional teaching tools (Obeso et al., 2023). Educators may establish accounts dedicated to the dissemination of educational content (Torphy et al., 2020), wherein they may periodically disseminate brief videos and other subject-related resources. This approach capitalizes on the visual and interactive nature of Instagram to enhance student engagement and facilitate learning (Korucu-Kiş, 2023). Students can follow these accounts and access the content at any time, providing them with the opportunity to review concepts and strengthen their learning.

2.3. Instagram to improve student communication, participation, and motivation

In an age dominated by digital platforms and social media, Instagram has emerged as a versatile and visually engaging tool that is increasingly finding its way into educational settings (Taskiran et al., 2018). This platform’s unique features, such as short videos, stories, and interactive elements, have the potential to transform the way educators and students communicate, participate in learning activities, and find motivation in the educational journey (Carpenter et al., 2020).

Rothschild (1999) suggested that while an individual’s behavior is determined by motivation, the environment plays a facilitating role and constitutes an opportunity. Ability, on the other hand, pertains to behavior-related skills and knowledge. According to the MOA framework, motivation can directly impact individual behaviors, with ability and opportunity moderating these behaviors (MacInnis & Jaworski, 1989). MOA theory explores how students can develop intrinsic motivation to learn, i.e., motivation that stems from a genuine interest in the content and a sense of autonomy and competence. Student satisfaction with their educational experience, which can be affected by effective communication, engagement, and interaction with the content, is seen as an essential component in driving this intrinsic motivation.

Instagram provides a visually engaging and easily accessible platform that can facilitate effective communication between teachers and students (Handayani, 2015). Through the direct messaging feature and comments on posts, students can ask questions, seek clarifications, and engage in discussions with their teachers in a more informal and friendly manner than traditional communication methods such as email or online forums. A study conducted by Small et al. (2012) reveals that tools facilitating communication between teachers and students, as well as bidirectional feedback, are more meaningful and satisfying for students than those enabling interaction among students themselves. This more direct interaction can foster a better understanding of the content and reduce communication barriers, which, in turn, could increase students’ motivation to participate in class and seek additional support. Based on these studies, we propose the following hypothesis:

Hypothesis 1. Instagram enhances communication between teachers and students in educational settings.

The visually appealing and interactive nature of Instagram, along with features like polls, questions, and sliders, provides teachers with tools to actively engage students in educational activities (Aslan, 2024). By using these features, teachers can create content that encourages students to answer questions, express their opinions, and participate in online discussions (Lyu, 2018). Active participation in these activities may heighten students’ interest in the content and encourage their continued involvement in educational activities, potentially improving their performance and motivation in learning (Balaji & Chakrabarti, 2010). A recent study has shown the importance of digital tools for improving educational participation (see, for example (Gonzalez-Mohino et al., 2023). The student perceives that creating digital content, such as producing videos, can be more effective than traditional methods, as they enjoy these activities while increasing their participation (Navío-Marco et al., 2024). Therefore, the following hypothesis is proposed:

Hypothesis 2. The use of Instagram increases student participation in educational activities.

Instagram enables the formation of educational communities where teachers and students can connect, interact, and share resources and ideas (Carpenter et al., 2020). The ability to follow educational accounts dedicated to specific subjects gives students constant access to relevant content (Farrell & Brunton, 2020). This educational community can instill a sense of belonging and intrinsic motivation, as students feel part of a group with common interests. Collaboration and support among peers and teachers in this environment can boost students’ motivation by providing them with a support network and a space where they can collaboratively develop their learning (Qureshi et al., 2023). The following hypothesis is proposed:

Hypothesis 3. Instagram motivates students through the creation of educational communities.

2.4. *Communication, participation, and motivation for the improvement of student satisfaction*

Effective communication and active participation in the educational process are fundamental components of a successful learning environment (Vlachopoulos & Makri, 2019; Walton, 2013). When students and teachers engage in clear and open communication, the educational experience can become more enriching and satisfying, fostering deeper connections, and dispelling doubts. Moreover, the students' sense of belonging and intrinsic motivation can significantly impact their overall satisfaction (Raza et al., 2015) with their educational journey. Dennen et al. (2007) discovered that interpersonal communication, as well as responsive and timely interaction between instructors and students, were crucial factors for student satisfaction. They noted that students were content even when communication took place in communal online platforms like notice boards. Similarly, Bray et al. (2008) identified easy communication with faculty as a key predictor of student satisfaction.

Clear and open communication between teachers and students can strengthen relationships, dispel doubts, and provide a more welcoming learning environment (Hoffman, 2014). The argument posits that when students feel heard and understood, they experience greater satisfaction with their educational experience, resulting in increased motivation and participation. Building on the previous rationale, we propose the following hypothesis:

Hypothesis 4. More effective communication between teachers and students leads to greater student satisfaction.

Studies have affirmed that students recognize the importance of interpersonal interactions with their classmates and university staff in furthering their content learning (Hurst et al., 2013). Participation entails a deeper engagement with the material and a stronger sense of belonging in the educational community (Pike et al., 2011). This suggests that students who actively engage in classes, discussions, and education-related activities will experience higher satisfaction, as they will feel more connected and valued in their learning process. These interactions (participation) between students and their teachers, could be a key precursor to student satisfaction (Wong & Chapman, 2023). In this context, we propose:

Hypothesis 5. Higher levels of student participation in educational activities are positively related to student satisfaction.

Deci (1975) proposed that intrinsic motivation refers to individuals' pursuit of feelings of competence and self-determination (as cited in Deci & Ryan, 2000). Intrinsic motivation, stemming from genuine interest and enjoyment of learning, is a key factor in student satisfaction (Deci et al., 1996). Activities that enhance intrinsic motivation lead to deeper engagement, which results in promotion and growth (Deci & Ryan, 2000). For instance, as students experience satisfaction, they enhance their self-motivation. Intrinsic value refers to the motivation that heightens learners' interest in the tasks presented to them (Bailey et al., 2021). Once they are motivated to perform an activity or task, they will ultimately exert all their determination, time, and energy to continue learning (Deci & Ryan, 2012). This suggests that students who find motivation in their course content and feel that their needs and aspirations are being met will be more satisfied with their overall educational experience. Consequently, we formulate the following hypothesis:

Hypothesis 6. Students' intrinsic motivation is directly linked to their educational satisfaction.

2.5. *The indirect effect of using Instagram for educational satisfaction*

While these factors have been shown to be integral to the satisfaction of learners, the extent to which Instagram can indirectly impact student satisfaction through these mechanisms remains an intriguing area of exploration. Building on the foundational hypotheses that link communication, participation, and motivation to student satisfaction, we propose three additional hypotheses that delve into the potential indirect effects of Instagram on the overall educational satisfaction of students.

The use of Instagram as an educational tool enhances communication between teachers and students (Handayani, 2015), which in turn leads to greater student satisfaction. Improved communication through Instagram, including direct messages and comments, provides students with a platform to interact with their instructors more informally and effectively. Furthermore, the utilisation of Instagram Stories for the dissemination of daily class updates, assignment reminders, and interactive activities such as polls or brief questionnaires can serve to maintain student engagement and facilitate a sense of connection with the course content (Alfonzo, 2019). The use of Stories facilitates rapid and aesthetically pleasing communication, which can more effectively capture students' attention and foster a greater sense of connection to the learning process (Tarigan et al., 2021). This enhanced communication fosters a sense of connection and understanding, ultimately resulting in increased student satisfaction. Thus, the following hypothesis is established:

Hypothesis 7. The use of Instagram has a positive and indirect impact on educational satisfaction through communication.

Active student participation in educational activities facilitated by Instagram is positively associated with higher student satisfaction (Richter et al., 2022). The interactive features of Instagram, such as polls, questions, and discussions, encourage students to actively engage in learning. The strategic use of social media among university students has the potential to enhance both participation and academic performance by leveraging social incentives such as recognition and convenience (Mikum et al., 2018). The integration of social media practices within the classroom can facilitate enhanced student collaboration, engagement, and collaborative learning, thereby addressing the needs of digital-native students and proposing effective strategies to enhance performance and satisfaction in higher education (Lahuerta-Otero et al., 2019). One illustrative example is the creation of a weekly newsletter, which is managed by the students themselves. This newsletter can serve as a platform for sharing relevant news, upcoming events, and summaries of class

lessons. This activity not only engages students in the collection and presentation of information but also provides a forum for self-expression and collaboration with their peers, thereby fostering a sense of community and commitment. The findings of [Obeso et al. \(2023\)](#) indicate that the perceived usefulness of Instagram is the primary determinant of student satisfaction and learning outcomes. Their participation in educational content and discussions on the platform creates a sense of involvement and value within the academic community, consequently leading to elevated student satisfaction. The hypothesis is the following:

Hypothesis 8. The use of Instagram has a positive and indirect impact on educational satisfaction through participation.

Instagram’s visual and interactive features enhance students’ intrinsic motivation, which, in turn, positively influences their overall educational satisfaction. The platform’s visually appealing content and interactive elements ([Essig et al., 2020](#)), coupled with the convenience of access, create an environment that sparks students’ intrinsic motivation for learning. As posited by [Rosa-Castillo et al. \(2022\)](#), the integration of Instagram as an ancillary component of pedagogical praxis can prove advantageous and inspiring for the acquisition of novel knowledge. For example, the utilisation of Instagram for class projects enables students to create and disseminate visual content, such as infographics or explanatory videos, pertaining to the subject matter under study. This illustrates the efficacy of social media as a pedagogical tool, as it allows students to disseminate resources, offer feedback, and participate in real-time discussions. These practices can motivate students because they are based on platforms with which they are already familiar and enjoy using in their daily lives. The integration of Instagram can significantly enhance performance and satisfaction in higher education by promoting interactive and visual teaching-learning strategies ([Lahuerta-Otero et al., 2018](#)). Furthermore, the potential for immediate feedback and peer recognition through likes and comments may enhance students’ intrinsic motivation, fostering greater commitment to their learning. This heightened motivation, rooted in genuine interest, contributes to their overall satisfaction with their educational experience. Therefore, the following hypothesis is proposed:

Hypothesis 9. The use of Instagram has a positive and indirect impact on educational satisfaction through motivation.

The following is the proposed research model ([Fig. 1](#)):

3. Methodology

3.1. Population identification and profiling

This study was conducted in four distinct stages. The initial phase involved the identification and profiling of our research population, which comprised students of Business Administration program at the University of Cordoba, Spain. These students had previously engaged with short Instagram videos as part of their coursework, thanks to pedagogical practices. To assemble our research cohort, we included all students enrolled in the Business Administration program at the University of Cordoba. By employing the university’s official website, we extracted 360 contact details of individuals between the ages of 18 and 22. This resulted in a final population of 338 students, who were subsequently contacted for participation in the study.

3.2. Survey design

The second stage of our research encompassed the design of the survey and the associated administration. We opted for an exploratory survey research approach due to the absence of prior studies that aimed to identify the primary impacts of Instagram on the teaching methods employed by universities. Consequently, we concluded that our research was still in its preliminary stages, striving to shed light on this emerging phenomenon. Thanks to Google Forms, we meticulously crafted a questionnaire divided into five sections: 1st section: An introductory segment providing a general overview of the research’s aims and objectives. 2nd section: A series

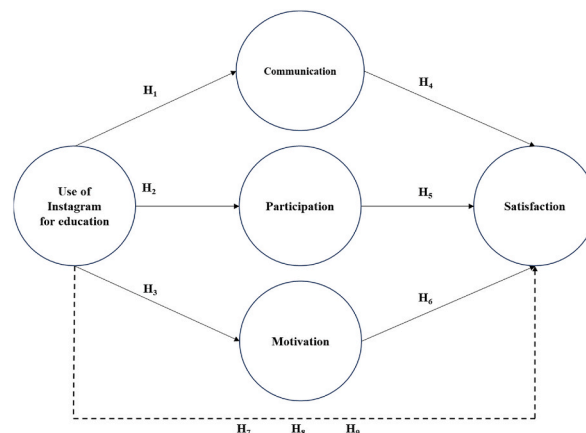


Fig. 1. Research model.

of questions aimed at profiling our study population, encompassing factors such as age, gender, the number of hours spent on Instagram, and the number of hours dedicated to Instagram for educational purposes (Erarslan, 2019).

3rd section: We employed standardized scales to assess all study variables (see appendix). All variables were measured by adopting and adapting scales from related literature. A five-point Likert scale (where 1 indicates strong disagreement and 5 indicates strong agreement) was employed to assess the instrument measurements. The participants were requested to indicate their level of agreement or disagreement with the items presented in the research instrument. For measuring the use of Instagram for educational purposes, we adapted and utilized a measurement tool developed by Erarslan (2019). To evaluate team member communication, we adapted and employed a scale proposed by Stewart and Gosain (2006). For measuring participation, we adapted and utilized a study developed by Carpenter et al. (2020). Motivation of students was assessed using a scale developed by (Min & Hashim, 2022). The measurement scales were adapted to align with the specific context of this study, with a particular focus on the use of Instagram as an educational tool in higher education. This approach provides simplicity and clarity, facilitating comprehension and response among participants. The selected items were meticulously selected to ensure comprehensive coverage of the most salient and critical dimensions of the motivation construct (eliminating motivations related to participation or communication, as these are already measured in other constructs). Satisfaction was assessed using a three-item scale adapted from Casaló et al. (2017) to align with the context of higher education. To test the validity and appropriateness of the questions, also in terms of their clarity, we conducted a brief user test before the official launch, to five randomly selected academics, whose insights proved to be essential.

The decision not to incorporate control variables was motivated by the exploratory and descriptive nature of this study. The model without controls can offer additional insights into the independent variables' capacity to explain uncontrolled variations in the dependent variable(s), as suggested by previous research (Becker, 2005; Becker et al., 2016).

3.3. Administration of the survey

Once the questionnaire was deemed effective for our research objectives, we advanced to the third stage of our defined research process: the survey administration. To accomplish this, we devised two transmissions, one for the morning group and another for the afternoon group. The data collection was conducted in two phases: the first in October–November 2023; and the second in May–June 2024.

Out of the total of 360 students, 338 provided responses, constituting a response rate of 93.88%. This response rate surpasses the established threshold of 20% commonly found in previous literature (Malhotra & Grover, 1998; Prinsloo & van Rooyen, 2007). The profile of the respondents can be seen in the following table (see Table 2):

4. Research findings

4.1. Data analysis

The study employed the structural equation modeling (SEM) technique (Nasution et al., 2020) with partial least squares (PLS), executed with SmartPLS 4.0 software (Ringle et al., 2022). The use of PLS-SEM is justified due to its capacity to accommodate small sample sizes and non-normally distributed data, thereby enhancing flexibility and suitability for exploratory studies and theory development. In contrast to CB-SEM, which assumes homogeneity among respondents and assesses net effects, PLS-SEM permits the modeling of intricate and formative relationships, thereby facilitating a more profound comprehension of the interactions between factors. This is especially crucial when causal symmetry and net effects can compromise the validity of findings (Foroughi et al., 2023; Woodside, 2019). The study collected data through the cross-sectional approach, common method bias (CMB) might be an issue problem in the measurement model. We checked for CMB using Harman's single factor test (Podsakoff et al., 2003), and it was found that no dominating factor with more than 50% variance. The results are consistent with prior literature standards and show that CMB

Table 2
Participants' profile.

Variable	Category	Number	Percentage
Gender	Man	186	55.03%
	Woman	152	44.97%
Time dedicates an Internet	Less than 1 h	36	10.65%
	1–2 h	57	16.86%
	3–5 h	107	31.66%
	6–7 h	78	23.08%
	More than 7 h	60	17.75%
Time dedicates an Instagram	Less than 1 h	86	25.44%
	1–2 h	146	43.20%
	3–5 h	106	31.36%
Knowledge of social networks for educational purposes	Yes	205	60.65%
	No	133	39.35%
Use of social networks for educational purposes	Yes	164	48.52%
	No	174	51.48%

Source: By the authors

was not an issue in our study. The results of the full collinearity test indicated that the variance inflation factors (VIF) for all constructs were below the recommended threshold of 5 (Hair J et al., 2014). Following Chin (2010), we analyzed the PLS model using a two-phase process. First, we assessed the reliability and validity of the measurement model. Second, the study evaluated the structural model to examine how the proposed model's causal relationships are related to the collected data.

4.2. Measurement model

In the measurement model, the outer loadings of the latent variable ranged between 0.666 and 0.911. The value of Outer Loading >0.5 (Chin, 1998; Hulland, 1999) to be considered acceptable. The composite reliability and RhoA values were above the established threshold. In this study, the composite reliability and RhoA values exceeded the cutoff value of 0.7 (Hair Jr et al., 2014). Cronbach's alpha, which is considered the most common measure of scale reliability (Henseler & Fassott, 2010), must be equal to or greater than 0.7 to indicate sufficient scale reliability. To evaluate convergent validity, it was verified that the average extracted variance (AVE) was above the 0.5 cutoff criterion. Table 3 shows the values of Cronbach's alpha, RhoA, composite reliability, and AVE for the variables in this study.

To measure discriminant validity of the constructs illustrated in Fig. 1, the data in Table 4 provide confirmation through the Fornell–Larcker criterion and Heterotrait–Monotrait (HTMT) relationships. The results of both tests, exhibiting values above 0.7 on the main diagonal (Fornell & Larcker, 1981) and HTMT values below 0.9, adhering to the recommended guidelines (Hair Jr et al., 2014). These findings, as presented in Tables 3 and 4, affirm the robustness of the measurement model's validity, thereby allowing for the progression to the evaluation of the structural model.

4.3. Structural model

The results of the coefficient of determination (R^2) revealed the variance in the dependent variable explained by the independent variable. The R^2 values were 0.167, 0.102, 0.233 and 0.105 for communication, motivation, participation and satisfaction, respectively (see Table 5). The R^2 values support the in-sample predictive power of the model (Sarstedt et al., 2014) since they are above the recommended level of 0.10 (Falk & Miller, 1992). To further evaluate the model's predictive relevance, we computed the Stone–Geisser Q^2 statistic. As stated by Chin (1998), a construct demonstrates predictive relevance when the Q^2 value is greater than 0 (Geisser, 1974). This condition is satisfied for all three dependent variables in our model (see Table 5). The F^2 value measures the impact of an exogenous variable on the endogenous variable when that exogenous variable is removed from the model. An F^2 value greater than 0.02 is considered small, greater than 0.15 is considered medium, and greater than 0.35 is considered large (Salkind, 2010). The F^2 values suggest that the effects of communication, motivation, and satisfaction on the dependent variables are small but present (see Table 5).

The evaluation of the structural model was completed in another phase. The direct and indirect hypotheses were tested (see Table 6).

The results of the analysis show significant evidence of positive relationships between the use of Instagram for educational purposes and the variables of communication, participation, motivation, and satisfaction. These relationships indicate that educational use of Instagram is positively associated with key aspects of user experience. These results may have important implications for the design of educational strategies using social platforms such as Instagram.

Table 3
Analysis of construct reliability with convergent validity.

Constructs	Items	Loads	α Cronbach	Rho A	Composite Reliability	AVE	Adapted from
Use of Instagram for education (UI)	UI1	0.600	0.703	0.722	0.706	0.510	Erarlsan (2019)
	UI2	0.550					
	UI4	0.657					
	UI5	0.641					
	UI6	0.641					
Communication (C)	C1	0.584	0.780	0.792	0.773	0.522	Stewart and Gosain (2006)
	C2	0.626					
	C3	0.586					
	C4	0.612					
	C5	0.612					
Motivation (M)	M1	0.616	0.733	0.741	0.735	0.508	Min and Hashim (2022)
	M2	0.635					
	M3	0.537					
	M4	0.567					
	M5	0.629					
Participation (P)	P1	0.679	0.710	0.720	0.705	0.511	Carpenter et al. (2020)
	P2	0.610					
	P3	0.628					
	P4	0.627					
	P5	0.627					
Satisfaction (S)	S1	0.712	0.741	0.752	0.740	0.577	Casaló et al. (2017)
	S2	0.691					
	S3	0.689					

*UI3, UI6, P4 and P6, were removed from the final model.

Table 4
Discriminant validity.

	C	M	P	S	UI
Communication (C)	0.722	0.778	0.773	0.831	0.824
Motivation (M)	0.431	0.713	0.735	0.742	0.607
Participation (P)	0.389	0.381	0.715	0.760	0.767
Satisfaction (S)	0.426	0.379	0.357	0.760	0.700
Use of Instagram for education (UI)	0.408	0.319	0.336	0.324	0.714

Diagonal: Discriminant Validity by Fornell's Criterion. Below the diagonal: correlations between factors. Above the diagonal is the HTMT Criterion.

Table 5
Model's predictive relevance.

	R ²	Q ²	F ²	
			P	UI
Communication	0.167	0.156	0.046	0.200
Motivation	0.102	0.099	0.048	0.113
Participation	0.233	0.102		
Satisfaction	0.105	0.101	0.033	0.117

Table 6
Validation of the proposed hypotheses.

	β	Standard deviation (SD)	T statistics	P values	Supported/Not Supported
H ₁ : Use of Instagram for education - > Communication	0.429	0.047	9.140	0.000	H ₁ : Supported
H ₂ : Use of Instagram for education - > Participation	0.328	0.055	6.011	0.000	H ₂ : Supported
H ₃ : Use of Instagram for education - > Motivation.	0.327	0.053	6.152	0.000	H ₃ : Supported
H ₄ : Communication - > Satisfaction	0.275	0.054	5.074	0.000	H ₄ : Supported
H ₅ : Participation - > Satisfaction	0.206	0.048	4.261	0.000	H ₅ : Supported
H ₆ : Motivation - > Satisfaction	0.252	0.053	4.748	0.000	H ₆ : Supported
H ₇ : Use of Instagram for education - > Communication - > Satisfaction (indirect effect).	0.118	0.029	4.124	0.000	H ₇ : Supported
H ₈ : Use of Instagram for education - > Participation - > Satisfaction (indirect effect).	0.068	0.020	3.422	0.001	H ₈ : Supported
H ₉ : Use of Instagram for education - > Motivation - > Satisfaction (indirect effect).	0.082	0.023	3.3578	0.000	H ₉ : Supported

5. Discussion

The results of the study demonstrate a strong positive relationship between the educational use of Instagram and communication (H₁), as well as in the participation (H₂), which is consistent with prior research emphasizing the role of social networks in facilitating communication and participation in educational contexts (Junco, 2014; Manca & Ranieri, 2016). These results align with those found by Kim et al. (2020), where social media helps design students communicate better and share ideas during the initial stages of their projects. These findings support the notion that social platforms, such as Instagram, can effectively promote interaction and engagement in learning environments.

The application of the MOA theory (Motivation-Opportunity-Ability) in this context facilitates the elucidation of these findings. The MOA framework posits that motivation, opportunity, and ability are the primary determinants of behavior (MacInnis et al., 1991). The use of Instagram serves to enhance students' motivation, providing a platform that is both familiar and enjoyable, as well as creating opportunities for interaction and content creation. Furthermore, it leverages the students' existing digital abilities. This theoretical framework provides insight into why the use of Instagram in an educational context has a significant impact on communication and participation.

Furthermore, the positive association observed between the educational use of Instagram and motivation (H₃), aligns with literature highlighting how social technologies can enhance motivation and improve user experience in educational settings (Caponetto et al., 2014; Ryan & Deci, 2000). The incorporation of social media platforms such as Twitter and Instagram into the academic setting has been demonstrated to markedly enhance student motivation and learning outcomes. This highlights the efficacy of these platforms as instruments to enhance the educational process (Hortigüela-Alcalá et al., 2019). This underscores the importance of creating engaging and meaningful educational experiences to enhance overall satisfaction among users. This lends support to the assertion of the MOA theory that motivation is a significant determinant of engagement and satisfaction. The integration of the self-efficacy theory provides further support for these findings. Self-efficacy, defined as the belief in one's capabilities to execute the actions required to manage prospective situations (Bandura & Adams, 1977), suggests that students who feel competent in using Instagram are more likely

to engage actively and benefit from its educational use. This theory complements the MOA framework by highlighting the role of digital confidence in enhancing motivation and participation.

Hypothesis 4 (H₄), which linked communication and satisfaction, is supported, aligning with prior research. Communication plays a crucial role in elucidating expectations, offering feedback, and addressing concerns (Bharadwaj, 2014). Educators who adeptly communicate can cultivate trust and rapport with their students, resulting in heightened levels of satisfaction (Xie & Derakhshan, 2021). Conversely, inadequate communication or misunderstandings may evoke frustration and discontent among students (Bailey & Phillips, 2016). This finding underscores the importance of the MOA framework's 'opportunity' aspect, suggesting that the context in which participation occurs (quality and interactivity) is crucial.

The relationship between participation and satisfaction also reached statistical significance (H₅). This is supported by previous studies that have found a positive association between the two (Balakrishnan & Gan, 2016; Kuh, 2009). However, the results of these previous studies suggest that participation alone does not always directly translate into higher levels of satisfaction. Other factors, such as content quality or interactivity, may play a significant role in determining user satisfaction.

Moreover, Instagram's versatility for facilitating communication between students and teachers, enabling the exchange of valuable information, and fostering supportive communities resonates with previous research highlighting its capacity to enhance connectivity and cultivate a sense of belonging (Carpenter et al., 2020; Perifanou et al., 2021). Its visual interface not only stimulates personal expression, but also increases its attractiveness as an educational platform, thus promoting greater interaction and satisfaction in educational environments (H₇). Given the support for **Hypothesis 5**, which linked participation and satisfaction, it is reasonable to assume that the indirect hypothesis involving Instagram use (**Hypothesis 8**) also shows an association.

Additionally, the integration of collaborative learning theory supports these outcomes by emphasizing the role of social interactions in enhancing learning outcomes (Dillenbourg, 1999). Instagram, by promoting student collaboration through shared projects and interactive discussions (Živojinović et al., 2023), aligns with this theory and contributes to a more engaging and effective learning environment.

Furthermore, studies such as those by Perifanou et al. (2021) suggest that leveraging Instagram for educational purposes, particularly through photo-based content, can enhance student connectivity, especially in fields where visual explanation is valuable, such as specialized courses in medicine (Douglas et al., 2019). This suggests a bidirectional relationship between technology use and motivation for learning, emphasizing the potential of social technologies to enhance motivation (H₉) (Gonulal, 2019).

The results underscore the positive impact of Instagram on communication, participation, motivation, and ultimately, satisfaction in educational settings. Integrating these theories provides a robust framework for understanding how digital platforms can significantly impact educational outcomes.

6. Conclusions

The findings underscore the importance of strategically integrating Instagram into educational environments to bolster communication, participation, and motivation among students. Furthermore, the adaptation of content to align with students' preferences via Instagram has emerged as a pivotal aspect in capturing their attention and facilitating their understanding of complex economic concepts.

Moreover, interaction through comments, questions, and debates on the Instagram platform has proven to be an invaluable ongoing assessment tool, fostering active learning and fortifying students' comprehension of economic principles. It is essential to recognize the indispensable role that university professors play in curating quality content, while acknowledging Instagram's dynamic and captivating medium for the dissemination of short videos, which further enhances the learning experience for students.

6.1. Theoretical and practical implications

The principal theoretical implication derived from this study is the corroboration and expansion of the MOA theory (Motivation-Opportunity-Ability) within the context of higher education, particularly with regard to the utilisation of digital platforms such as Instagram for instructional purposes. This application demonstrates that the combination of student motivation, opportunities for interaction, and digital skills has a significant impact on their participation, communication, and academic satisfaction. Moreover, the study presents a comprehensive theoretical framework that elucidates the mechanisms through which confidence in digital skills and student collaboration can enhance motivation and improve educational outcomes. This framework is derived from the integration of self-efficacy theory and collaborative learning theory. The integration of these theories provides a more nuanced understanding of how digital tools can be utilized effectively in an educational setting to enhance the learning experience.

Educators can design strategies leveraging Instagram's features to enhance student motivation, such as creating visually engaging content, interactive challenges, or collaborative projects. Understanding meaningful sequential relationships underscores the importance of developing evaluation strategies considering the interconnectedness of variables. Instagram serves as an effective educational tool for teaching economic concepts through short videos, emphasizing the need to tailor teaching to students' preferences and habits on popular platforms. Continued evaluation of this educational strategy's effectiveness and student feedback are crucial for enhancing student learning and promoting greater engagement with economic content.

Instagram emerges as a potent educational tool for teaching complex concepts, particularly in disciplines such as economics, through the medium of short videos. The platform's visual nature lends itself well to conveying ideas in a concise and engaging manner, catering to the preferences and habits of contemporary learners. The incorporation of novel technologies and social media in the educational setting has the potential to markedly enhance student engagement, interaction, and motivation. It is imperative to

promote the use of information and communication technologies (ICT), with a particular focus on visual platforms such as Instagram, in order to achieve this objective. This research demonstrates how digital platforms can enhance intrinsic motivation through the use of Instagram’s interactive features. Furthermore, the enhanced communication and participation enabled by Instagram contribute to increased student satisfaction, which in turn strengthens interactions between students and teachers and fosters a sense of belonging in virtual learning environments. The incorporation of student-led content creation, such as video production, facilitates the integration of project-based learning and the development of digital competencies. The incorporation of social media into pedagogical models has been demonstrated to enhance teaching and learning, with digital tools identified as a key element in the educational process.

6.2. Limitations and future research

The study is primarily centered on students’ perceptions, overlooking the viewpoints of other key educational figures such as school administrators or parents. Additionally, the research was conducted within a specific context, raising questions about the generalizability of the findings to diverse educational settings. Methodological biases, including participant self-selection and a lack of control over external variables, may have influenced the outcomes. Furthermore, the evaluation of Instagram’s educational effectiveness relies heavily on metrics related to participation and satisfaction, potentially overlooking its impact on academic achievement. To address these limitations, future research should embark on longitudinal studies to explore the enduring effects of Instagram integration in educational environments. Furthermore, there’s a need to delve into the perspectives and experiences of various educational stakeholders, including administrators, parents, and teachers, for a more holistic understanding of Instagram’s role in education. Advanced analytical tools should be employed to delve deeper into the impact of Instagram-based educational strategies on students’ academic performance. Moreover, investigations should examine how factors such as technology access and cultural nuances influence the efficacy of Instagram integration in education. Lastly, exploring alternative social platforms and emerging technologies for teaching and learning could provide valuable insights into effective educational practices beyond Instagram.

CRedit authorship contribution statement

Miguel González-Mohino: Writing – original draft, Supervision, Methodology, Conceptualization. **José E. Ramos-Ruiz:** Writing – review & editing, Data curation. **José Antonio López-Castro:** Data curation, Conceptualization. **Lucía García-García:** Writing – review & editing, Supervision.

Data availability

Data will be made available on request.

Appendix

Use of Instagram for educational purposes	1	2	3	4	5
Using Instagram for educational purposes would be convenient (UI1)					
Instagram could be used to support face to face learning (UI2)					
Using Instagram for class could promote motivation for learning (UI3)					
Using Instagram for class could make me feel more connected to my learning community (UI4)					
Instagram could be used effectively to share class materials (UI5)					
Using Instagram as an educational platform could promote better rapport with peers (UI6)					
Communication	1	2	3	4	5
Instagram serves as a platform for timely communication through comments, debates, and questions (C1)					
The responses to my questions and comments on Instagram are correct and useful (C2)					
People on Instagram respond to my questions thoughtfully (C3)					
There is little wait time between when I ask a question and when someone on Instagram answers it (C4)					
Participation	1	2	3	4	5
I would regularly access the Instagram account for the economics class (P1)					
I would frequently post content related to the economics class on Instagram (P2)					
I would interact with the Instagram account posts for the class, such as liking or commenting (P3)					
I would share educational content related to economics on my personal Instagram profile (P4)					
I would actively participate in discussions and debates related to the Economics class in the comments of the posts (P5)					
I would collaborate on projects or assignments via Instagram with my classmates (P6)					
Motivation	1	2	3	4	5
I do not feel bored when joining a lesson (M1)					
I feel enthusiastic/motivated to follow the lesson (M2)					
I gain a lot of knowledge in Business Administration learning (M3)					
I develop skills related to Business Administration (M4)					

(continued on next page)

(continued)

Use of Instagram for educational purposes	1	2	3	4	5
I feel motivated by being able to complete and submit tasks on time (M5)					
Satisfaction	1	2	3	4	5
In general terms, I am satisfied with my experiences in this Instagram account (S1)					
I have obtained several benefits derived from visiting this Instagram account (S2)					
I think that I made the correct decision to follow this Instagram account (S3)					

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