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Enhancing students' learning outcomes through smartphones: A case study of using instagram in higher management education

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ABSTRACT

Social media have become an integral part of people's lives worldwide, particularly for students in higher education, most of whom belong to Generation Z. Hence, there is a need for universities to develop technological content adapted to the preferences of today's students. One of the most popular social media platforms is Instagram (IG); however, studies investigating how it can be used to support learning are scant, especially in the context of higher education institutions. Accordingly, using structural equation modelling (SEM), this study analyses the results of a project using IG as a supporting tool that complements traditional lectures to promote learning in a subject in a Bachelor of Business Administration (BBA) degree. The results show that the perceived usefulness of IG is the main predictor of students' satisfaction and perceived learning outcomes. Additionally, they highlight the value of using this social media platform to support and enhance the user-friendliness of courses to increase student engagement in higher management education contexts.

1. Introduction

Digitalization of all aspects of life appears to be inevitable (Glebova & Zare, 2023). In particular, the popularity of social media has increased over the past few years (Nkhoma et al., 2015; Smart Insights website, 2002) with 3.6 billion users of social media worldwide in 2021, a number expected to increase to about 4.41 billion by 2025 (Borges Viana et al., 2021). Consequently, the use of social media has attracted considerable attention in diverse fields (Huisa et al., 2020), including education (Hamid et al., 2015; Lackovic et al., 2017). In the education field, 90% of college students use social media regularly in their lives as an essential communication tool (AlFaris et al., 2018), and almost 70% of them consider smartphones as important to their academic activities (Borges Viana et al., 2021). Hence, many studies have considered the potential of social media as part of the students' educational experience, being aware that social media can promote learning (Chugh et al., 2020; Hortigüela-Alcalá et al., 2019), create collaborative environments (Izquierdo-Iranzo & Gallardo-Echenique, 2020), improve accessibility, facilitate easier communication (AlFaris et al., 2018; Chugh et al., 2020; Nurkhin et al., 2020), and increase students' engagement (Al-Bahrani & Patel, 2015; Diao & Hedberg, 2020). Despite the benefits through which social media can enhance the learning process (e.g. Borges Viana et al., 2021; Hortigüela-Alcalá et al., 2019; Nurkhin et al., 2020), recent studies have identified some negative effects on students' attention and health (Nema et al., 2023). Hence, there is a need for more research into its use (Carman et al., 2021; Chugh et al., 2020; Veletsianos & Kimmons, 2016), especially in

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higher education contexts (Khaola et al., 2022; Manca, 2020). Social media have emerged as a useful tool for instructors to interact with students (Al-Bahrani & Patel, 2015), thus complementing traditional teaching methods (Prudencio et al., 2021). However, there is no consensus in terms of the nature of social media contributions to the learning process (Lackovic et al., 2017), and empirical studies in this regard are still limited (Lopez-Carril et al., 2022).

Among the most popular social media platforms of Instagram (IG), Facebook, Twitter, and Tiktok (GWI Report, 2022), IG is one of the fastest growing platforms (Akhiar et al., 2017; Bonilla et al., 2019; Pilar et al., 2019) with 1.27 billion users worldwide in 2022, a number expected to increase to approximately 1.5 billion users in 2026 (Statista, 2022). IG was created in 2010, and compared to other social networks, it is characterized by its more visual nature, with different options for sharing photos and videos (Al-Bahrani & Patel, 2015; Carpenter et al., 2020; Mikum et al., 2018; Pilar et al., 2019). Despite the increasing relevance of IG, it has received little attention in empirical research in the higher education context (Carpenter et al., 2020). Research has focused on the educators' use of other social media platforms, such as Facebook (e.g. Giannikas, 2020; Moghavvemi, Sharabi, Paramanathan, & Rahin, 2017) and Twitter (e.g. Liu, 2018; Osgerby & Rush, 2015). Meanwhile, the limited research on IG has focused on the fields of health (Essig et al., 2020; Huisa et al., 2020; Prudencio et al., 2021; Ye et al., 2020), chemistry (Korich, 2016), and language learning (Akhiar et al., 2017; Fornara & Lomicka, 2019; Yeh & Mitric, 2020). To our knowledge, no previous studies have investigated the use of IG for academic purposes in the social sciences or, in particular, in the context of a bachelor of business administration (BBA). Furthermore, although most existing studies have confirmed the effectiveness of IG as a tool to enhance students' satisfaction and perception about their learning (Essig et al., 2020; Fornara & Lomicka, 2019; Korich, 2016; Prudencio et al., 2021), this relationship has been mostly studied using descriptive analysis. Thus, more studies are therefore needed to establish the utility of IG in higher management education.

In this context and considering that a recent report has highlighted that Generation-Z students are using IG more than other social media platforms (GWI Report, 2022), instructors can consider IG as a valuable tool that complements traditional teaching. Specifically, instructors can use IG to share videos, news, and main concepts about the subject or to correct exercises. Additionally, students can use IG to answer questionnaires about the topic at the end of each lesson in real time to review their knowledge about it. Hence, the present study focuses on the following research question: Does the use of IG as a complementary tool to traditional teaching enhance BBA students' satisfaction with the learning process and perceived learning outcomes?

To address this question, and in line with other studies (e.g. Al-Adwan et al., 2020; Al-Rahmi et al., 2018), this work is based on an adaptation of the technology acceptance model (TAM) (Davis, 1989). TAM is models how users come to accept and use technologies (Rauniar & Jei, 2014), and in particular for explaining course management system usage and satisfaction using the Internet (Landry et al., 2006; Stoel & Lee, 2003). Thus, its application to the IG platform may make sense. In particular, and in line with Pérez-Pérez et al. (2020), the TAM's adaptation consists of analysing the impact of two usability factors (i.e., perceived ease of use and perceived usefulness) (Escobar-Rodríguez & Monge-Lozano, 2012), which lead people to accept or reject an information technology, thus strongly influencing their satisfaction, and further, the impact of this satisfaction on perceived learning outcomes. In the current study, we analyse data from a sample of 108 undergraduate BBA students from the University of Cantabria in Spain during the 2020/21 academic year.

By addressing this research question, the present study contributes to the existing literature in several ways. First, it extends the literature on social media in higher education with its focus on IG, given that previous research has focused on the use of other social media applications, such as Facebook and Twitter, which are not popular among current Generation-Z students. Second, it extends the scarce literature on the use of IG in higher education by analysing the specific context of BBA, which, to the best to our knowledge, remains unexplored. Thereby, this study is the first to investigate the use of IG in higher management education. In addition, it proposes and tests a new model based on TAM model for exploring whether the perceived ease of use and perceived usefulness of IG enhance students' satisfaction and, consequently, improve their learning outcomes.

The remainder of this paper is as follows. Section 2 investigates the role of IG as a learning tool for students in higher education, most of whom belong to Generation Z. Then, Section 3 establishes the research model and develops the research hypotheses. Section 4 describes the research methodology. Sections 5 and 6 present and discuss the results, respectively. Finally, Section 7 summarizes the main results, identifies the limitations of the study, and explores future research directions.

2. IG: Why it could be a relevant learning tool in current higher education contexts?

The literature investigating the effects of social media usage on the learning processes has yielded mixed results. On the one hand, some recent studies have highlighted the negative effects of social media on students' attention (Nema et al., 2023) and health, such as disturbance of the sleep routine (Nema et al., 2023), anxiety, depression, or extraversion (Pellegrino et al., 2022). Research has pointed out that the use of IG is associated with negative consequences as depression (Bozzola et al., 2022; Lup et al., 2015) and loneliness (Kelly et al., 2020; Wallace & Buil, 2021). Additionally, it promotes comparisons with unrealistic posts (Weber et al., 2021), thus causing body dissatisfaction (Boulus et al., 2016; Prichard et al., 2021; Wiederhold, 2019). Moreover, the irresponsible use of IG is linked to negative effects (Wallace & Buil, 2021), anxiety about communication, and fear of negative evaluation (Kelly et al., 2020) Further, it may cause cyber bullying, sexting, addiction (Romero-Rodríguez et al., 2020), and self-harm (Boulus et al., 2016). On the other hand, a second stream of literature points out the positive impacts of social media on students' learning experience (AlFaris et al., 2018; Chugh et al., 2020; Diao & Hedberg, 2020; Hortigüela-Alcalá et al., 2019; Izquierdo-Iranzo & Gallardo-Echenique, 2020). In line with the second research stream, the current study proposes that the use of IG could emerge as a relevant complementary learning tool to traditional lectures within higher management institutions.

Regarding the students' learning preferences, people belonging to Generation Z, often called "digital natives," have grown up surrounded by digital technologies (González-Hernando et al., 2020). As they were born between 1995 and 2010, they have been the

first generation to have broad access to any type of information due to smartphones (Flom et al., 2023). People belonging to Generation Z are attentive to visual content and social media, and smartphones are omnipresent in their daily lives (García-Ruiz et al., 2018). This generation is generally considered highly adaptable to digital content; able to operate on multi screens and multi devices simultaneously; and is characterized as fast, impatient, and interactive (González-Hernando et al., 2020). In terms of their preferred learning process, Generation-Z students need different forms to learn in a more interactive way and is less dependent on traditional lectures (Flom et al., 2023). Thus, instructors need skills in developing technological and pedagogical content and activities (Diao & Hedberg, 2020), and universities need to adapt to changes in content delivery (González-Hernando et al., 2020). Thus, universities need to combine traditional teaching methods with new technologies (Manca & Ranieri, 2016).

Therefore, there is a need for universities to adapt their programs to this new reality by combining formal and informal learning methods (video tutorials, open-source content, and social media platform that allow learning anytime and anywhere) and promoting digital literacy (González-Hernando et al., 2020; Hashim et al., 2022; Shurygin et al., 2022) to utilize smartphones and social media platforms for learning (Orji et al., 2022). According to the Educause Center of Analysis and Research (ECAR), whose main goal is to understand the role of technology, including information technology, in colleges and universities, has recently recommended for institutions to be "mobile-ready" (Mikum et al., 2018).

In this context, IG has emerged as an interesting tool in allowing instructors to share graphs or short videos to reinforce ideas presented in class, considering that students' retention of information increases when it is presented in a visual format (Al-Bahrani & Patel, 2015; Fernández-Díaz et al., 2021). IG can facilitate the transition from a rigid traditional face-to-face medium to a more flexible and interactive learning experience (Lopez-Carril et al., 2022). It is one of the fastest growing social networks worldwide (Akhiar et al., 2017; Bonilla et al., 2019; Pilar et al., 2019). Specifically, students spend more time per day on IG, compared to other social media (Budenz et al., 2022). In the case of BBA students, this is interesting because the tool offers the possibility of sharing news related to the course immediately, such as strategic decisions related to the board of directors, events that influence strengths, weaknesses, opportunities, and threats (SWOT) analysis or decisions about their competitive advantages. This offers an opportunity for BBA students to monitor real-world strategic management and learn about the subject outside the classroom.

Compared to other social media, IG has been chosen for the following reasons. First, IG is the social media platform preferred by Generation Z. Following data published by GWI Report (2022), Generation Z uses IG, Facebook, Twitter, and TikTok, in this order; however, TikTok is becoming more popular among Zoomers. Meanwhile, Facebook is the most used social media platform by Millenials, Gen X, and Baby Boomers, offering a most conventional experience. In the case of Spain, the IAB (Interactive Advertising Bureau) IAB Spain Report (2022) confirms IG as the social media platform preferred by Z (96% use it), followed by Twitter (53%) TikTok (45%) and Facebook (41%). Additionally, IG ranks as the top the social media platform rated by users (8.4/10), whereas Facebook ranks last (7.9/10 points). Second, IG offers different features than others social media platforms. For example, TikTok is based on videos and Twitter is based on short texts, while IG combines videos, text, images, and interactions such as questionnaires or question boxes. These features allow better communication about academic subjects. Finally, although Facebook offers similar features, it is considered as used more by old people and family, while IG is linked with entertainment and more fun (IAB Report, 2022).

Therefore, based on the above-mentioned arguments, the reasons that motivate the use of IG as a learning tool are twofold: on the one hand, it is the social media platform preferred by current BBA students, belonging to Generation Z; on the other hand, because the app has utilities very useful for the education objective.

The proposed model is based on the theoretical underpinnings of the TAM. Developed by Davis (1986). TAM is one of the most prominent models in information technology acceptance research (Venkatesh et al., 2003) and so far also the prevailing theoretical approach regarding users' adoption of social media (Wirtz & Göttel, 2016), in particular with student respondents (Sidanti, Murwani, Wardhana, & Sopiah, 2021). The TAM is based on the theory of reasoned action (TRA) developed by Fishbein and Ajzen (1975) that reveals perceptions and relates them to behaviours (cited in Al-Rahmi, 2013). The aim of the TAM is to explain users' behaviour in relation to a technology by relating it to the acceptance of the technology (Rauniar & Jei, 2014). Following Arbaugh (2004, p. 172), it *"may provide insights into the technology's influence on course outcomes."* TAM has been used to analyse educational technologies in e-learning contexts (Aparicio et al., 2016; Arbaugh et al., 2009) such as Moodle (e.g. Arteaga-Sánchez & Duarte-Hueros, 2010; Pérez-Pérez et al., 2020) or massive open online courses (MOOCs) (e.g. Wang et al., 2020; Wu & Chen, 2017), as well as social media platforms such as Facebook (e.g. Ambrose et al., 2020; Doleck et al., 2017) and Twitter (e.g. Gao & Li, 2019). It is considered a useful framework for explaining course management system usage and satisfaction using the Internet (Landry et al., 2006; Stoel & Lee, 2003), thus its application to IG may make sense. Despite of the popularity and educational potential of social media (Fornara & Lomicka, 2019), as well as the relevance of TAM for *"discussing questions of new technologies being accepted by a certain target"* (Finkbeiner, 2013, p. 13), empirical research on social media within the context of higher education is still scarce and largely experiential (Fornara & Lomicka, 2019), thus limiting the generalizability of the results. In addition, the existing studies about IG in higher education mainly focus on medical education (Essig et al., 2020; Prudencio et al., 2021; Rosa-Castillo et al., 2022), while in areas such as management learning the research is still missing. This is important because, according to previous literature review, the existing evidence is quite heterogeneous and dependent on the social media-related contexts, that is the area of application (Wirtz & Göttel, 2016). Consequently, and despite of the subsequent extensions of TAM such as TAM 2 and other revisions (Sidanti et al., 2021), we have included variables of the original TAM model in our study, in order to extend the existing evidence about the use of IG in higher education based on TAM to the business learning context, on the one hand. On the other hand, use the original TAM will also allow us to facilitate the comparison of our results with those in other areas of application.

TAM (Davis, 1989; Davis et al., 1989) proposes two usability factors that lead people to accept or reject an information technology (Escobar-Rodríguez & Monge-Lozano, 2012): perceived ease of use and perceived usefulness. Both of them are considered factors that influence people's attitudes (Chen & Chengalur-Smithm, 2015). In line with this theory, the proposed model includes the two related

variables of IG perceived ease of use and perceived project usefulness. Following Davis (1989), IG perceived project usefulness refers to individuals' perceptions about the likelihood that following an IG project would enhance their performance in the subject (i.e. if the use of IG can enhance the BBA students' performance), while the perceived ease of use of IG refers to the degree of difficulty expected by the user when using IG. Previous studies, including Afacan Adanir and Muhametjanova (2021), Pérez-Pérez et al. (2020), Cao et al. (2013) and Islam and Azad (2015), among others, have used an adapted TAM to investigate student acceptance of using technologies to facilitate learning.

Davis (1989) was the first to suggest the factors of perceived usefulness and perceived ease of use as precursors to usefulness (Davis, 1989), and following studies have empirically confirmed this relationship (e.g. Hoang et al., 2021; Tavera-Mesias et al., 2022; Zahrani, 2021). Accordingly, this study put forward the following hypothesis:

Hypothesis 1. Perceived ease of use of IG (PEU) has an influence on IG perceived project usefulness (PU).

A positive relationship between perceived ease of use, perceived usefulness, and students' satisfaction has been identified previously (e.g. Pérez-Pérez et al., 2020). The social media experience influences students' satisfaction (Essig et al., 2020; Pérez-Pérez et al., 2020), and their use enhances positive engagement (Fornara & Lomicka, 2019; Hortigüela-Alcalá et al., 2019) and improves the communication between instructors and students (Akhiar et al., 2017; Ye et al., 2020; Yeh & Mitric, 2020). Based on previous literature, Islam and Azad (2015) has suggested that perceived usefulness and perceived ease of use are the key antecedents of satisfaction. In a learning environment, students' satisfaction is a relevant variable (Kang & Park, 2022), which is related to the achievement of their goals with respect to the subject; therefore, instructors should link activities to the attainment of these goals (Cassel, 1968). Hence, the following hypotheses are proposed in relation to satisfaction:

Hypothesis 2. Perceived ease of use of IG (PEU) has an influence on IG project satisfaction (SAT).

Hypothesis 3. Perceived project usefulness (PU) of IG has an influence on IG project satisfaction (SAT).

Moreover, previous studies have identified a positive impact of the usage of social media on individual learning performance (Sarwar et al., 2019). Research has identified a positive relationship between IG and learning outcomes (Fornara & Lomicka, 2019; Korich, 2016; Prudencio et al., 2021) and between perceived ease of use and perceived usefulness (related to the technological tools) and learning outcomes (e.g. Al-Adwan et al., 2019; Pérez-Pérez et al., 2020). The following hypotheses are proposed in relation to learning outcomes:

Hypothesis 4. Perceived ease of use of IG (PEU) has an influence on perceived learning outcomes (PLO).

Hypothesis 5. Perceived project usefulness (PU) of IG has an influence on perceived learning outcomes (PLO).

Pérez-Pérez et al. (2020) identified a positive impact of students' satisfaction on perceived learning outcomes (2020). In addition, Lee and Lee (2008) and Ifinedo et al. (2018) have empirically confirmed the positive effects of satisfaction on learning outcomes. Accordingly, we postulate the following hypothesis:

Hypothesis 6. IG project satisfaction (SAT) has an influence on perceived learning outcomes (PLO).

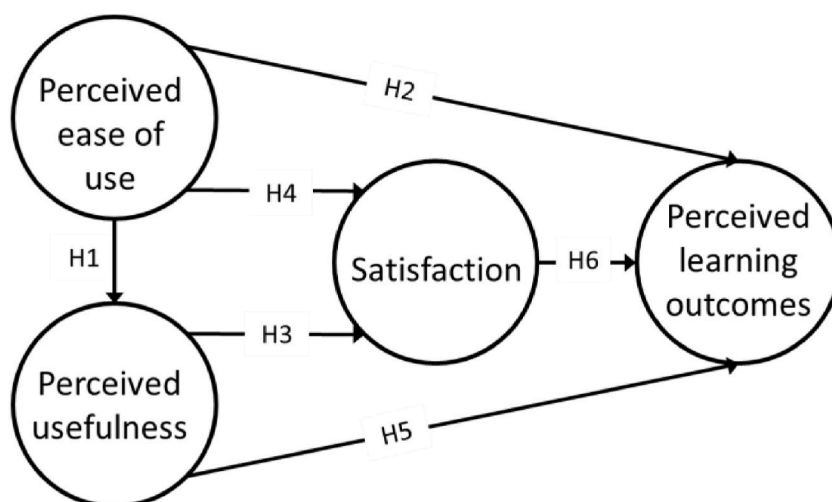The research model is depicted in Fig. 1.

Fig. 1. Research model.

3. Methodology

3.1. Study protocol and ethical aspects

This research followed a study protocol which contained the following sections: the aim of the study, the teachers involved in the project, the questionnaire to be completed, the categories of questions, the period for data collection, and the ethical standards required for research with human subjects (informed consent standards for teachers and BBA students).

The study protocol and ethical forms were submitted to the Ethics Committee of University of Cantabria (UC) to obtain the permission for conducting our research project. Research ethics approval was obtained in the Proceedings of the Extraordinary session of Ethics Committee of UC, held on 25 February 2021 (Project Code: "CE Proyectos 03/2021").

Teachers and students participated voluntarily after obtaining informed consent. Students were assured of both anonymity and confidentially of the data to obtain answers that were as honest as possible. To avoid any conflict of interest and participation pressure, it was particularly stressed that levels of engagement would not affect students' final module grades and that students reserved an unconditional right of withdrawal at any time without having to give any reasons.

3.2. IG project

The IG project was developed during the second semester of the academic year 2020/2021 as a support for learning Strategic Management, a subject belonging to the BBA degree at the University of Cantabria (Spain). Strategic Management is a mandatory course with four contact hours per week over 15 weeks (one 2-h lecture and one 2-h class session per week). The IG project was designed as a complementary and optional tool, maintaining the traditional lectures. In addition, following Al-Bahrani and Patel (2015) and Fernández-Díaz et al. (2021), IG is a potential tool to reinforce ideas presented in the classroom.

Before the development of the project and its implementation, the research team asked the BBA students about their use of social media and portable devices, distinguishing between the use for personal reasons and for academic purposes. In our sample, 83.62% of respondents (n = 49) confirmed IG as their favorite social media platform, and 95.65% used it (see Table 1). Thus, IG was chosen as a platform for communication and interaction among BBA students and between instructors and BBA students, with the aim of improving the overall learning experience and increasing student engagement outside the classroom. BBA students did not use the platform during classes.

IG was chosen as an optional out-of-class online social networking tool for communications related to the subject. BBA students following the project had IG accounts and the instructors created a formal profile for the subject. The students followed this profile, on which the instructors published various information.

The publications and interactions on the profile of Strategic Management, which was named @DireccionEstrategicaUC, included the following (please see Table 2 to get more information about the features):

- A section on "strategic management in real life": In this section, the IG Stories feature was used to share news about strategy, always related to the current lesson. In addition, the students could share the news using the question box feature of IG Stories. For example, instructors chose news published in economic newspapers (e.g. Expansion or El Economista) related to the lesson studied this week in the classroom and shared it with comments explaining the relationship.
- Quiz: At the end of each lesson, a test that reviews the knowledge acquired by the students was published using IG Stories. The students could answer the test using their smartphones in real time and then check their learning process. For example, the test on the first lesson had 10 questions with an ABCD format, where only one answer was correct.
- Short classes. Using the IG Reels feature, short reviews of concepts studied in the classroom were published using visual tools and with music. For example, in lesson 3 using the song *The Boat Beat* from Ricky Desktop, the instructors explained in 30 s the resource characteristics of firms that enable them to generate and maintain competitive advantages.
- Exercise solutions: Some exercises were proposed in the class, and the solutions were published using Reels, with a video explaining the correct answers. For example, in lesson 4, a video with a duration of 13 min and 5 s was used to solve a practice proposed in the classroom about how the COVID-19 pandemic affected different industries: was this a threat or an opportunity? (e.g. fruit and vegetables, restaurant and bridal businesses).
- Final questions: Some days before the exam, the students could use the question box on the IG Stories to ask questions about the subject, both the lessons and the exam. The questions were answered in the Stories in a video format (e.g. a student asked if the questions were short).

Table 1
Results of the questionnaire at the beginning of the course (in percentage).

	Students' favorite social media platform	Social media use	Social media use to learn at the University
Facebook	4.65	56.82	18.60
Instagram	83.72	95.65	23.26
Twitter	9.30	46.67	13.33
Tiktok	2.32	30.23	2.17

Table 2
Measures, pedagogical purposes, and students' involvement.

Sections on IG	Pedagogical purpose	IG feature used	Publications	Students involvement
Strategic management in real life	Bring students closer to the strategic management reality sharing real news about real firms so that they can view the application of the theoretical knowledge.	IG Stories[a]	Some publications per lesson	More than 100 views
Self-assessment test	Students can check their grasp of the knowledge acquired in each lesson with the tests.	Quiz sticker[b]	1 per lesson	
Final questions	Students can ask questions about the final exam and share them with all other students (anonymously).	Question sticker[c]	1 question box before the exam	19 questions
Short classes	Students can review the master lessons with the main ideas explained in the videos.	IG Reels[d]	11 publications	227 views and 337 likes
Exercise solutions	Students can check the answers and learn from the explanations.	IG Reels[d]	9 publications	141 views

Notes: Main characteristics of the features used in the IG course (source: Instagram official website http://instagram.com).

[a] IG stories allows *"you to capture the everyday, highlight the special moments, or express yourself with text, music, interactive stickers, filters, and GIFs to bring your stories to life"*.

[b] Quiz sticker allows to *"write your own multiple-choice question and customise the answers. Anyone who can see your story can respond by tapping an option that you've provided. Once posted, people can vote and learn whether they got it right. Swipe up on your own story to see how many votes each option received and how each person voted"*.

[c] Question sticker allows to *"write your own question and customise the type of answers. Select ***** to let people type a response to your question or tap ***** to let people send you a song. Anyone who can see your story can tap the sticker and send you a response. To see who responded, swipe up on your own story. Tap a response from someone to share it. Their photo and username won't be shown"*.

[d] IG Reels allows *"record and edit short videos. Learn how to add music, effects, and voiceovers to the clips you record, manage who can see your reels or use your audio and discover creators on Instagram"*. This feature has been used to solve exercises and explain theoretical concepts and they are available to be consulted by students anytime.

Table 2 includes details about the sections, pedagogical purposes, feature used, number of publications, and students' involvement.

3.3. Data collection and questionnaire

Data collection was carried out during the last class of the subject using a survey. A final sample of 108 BBA students (39.8% were males) which were enrolled in the project, completed the questionnaires, thus yielding a response rate of 77.14%. This response rate is similar to that of previous research (see for example Boubker et al., 2021 or Choi et al., 2022). As far as the sample error of 4.52%, providing a confidence level of 95% it *"is considered acceptable both in educational research, where accepted values range between 3% and 5% (Bartlett et al., 2001), and in survey research, with margins of error ranging from 2% to 6% (Särndal et al., 2003)"* (in Pérez-Pérez et al., 2020). In addition, and following Podsakoff et al. (2012), we use Harman's single factor test to confirm that common method bias is not a significant problem (a single factor emerged with a value lower than the cut-off point value of 50%). The participants ranged in age from 20 to 34 years old (more than 82% were between 20 and 24 years old).

The scales used in the survey were designed in accordance with previous literature (see Appendix A). Specifically, the perceived ease of use of IG (PEU) was measured with two items adapted from Sarwar et al. (2018) and Al-Adwan et al. (2020), and perceived project usefulness (PU) of IG was measured with two items adapted from Al-Adwan et al. (2020) and Pérez-Pérez et al. (2020). To measure perceived learning outcomes (PLO), a two-item questionnaire was adapted from Al-Adwan et al. (2020), Sarwar et al. (2019), and Pérez-Pérez et al. (2020). Finally, IG project satisfaction (SAT) was measured using a two-item questionnaire adapted from Pérez-Pérez et al. (2020) and Henry et al., 2020. All items were rated on a 5-point Likert scale ranging from 1 (*No/never*) to 5 (*very much*).

The validity of the questionnaire was confirmed through six referees (three researchers at the authors' institutions, two associate lecturers at the authors' institutions, and a professional in the education field) to judge the items' appropriateness for measuring the intended research questions and to decide whether the statements were understandable. Results of the pilot study were used to refine the questionnaire.

Table 3
Reliability and convergent validity.

Constructs	Items	Standardized factor loadings	CR	AVE	Cronbach alpha
Perceived IG ease of use	PEU1	0.690	0.907	0.542	0.680
	PEU2	0.780			
Perceived IG project usefulness	PU1	0.863	0.820	0.727	0.840
	PU2	0.842			
Perceived learning outcomes	PLO1	0.926	0.724	0.623	0.769
	PLO2	0.624			
Students' satisfaction	SAT1	0.839	0.840	0.652	0.781
	SAT2	0.775			

3.4. Statistical analysis

The research model was validated through structural equation modelling (SEM), a statistical technique which combines path analysis with latent factors (Nkhoma et al., 2015). The IBM SPSS 22 and AMOS 22 software packages were used for the analysis.

4. Results

First, the factor loadings meet the 0.5 cut-off value (Bagozzi & Yi, 1988). Moreover, all the constructs have a Cronbach alpha above 0.6, which following Hair et al. (2021) is acceptable in exploratory analysis. In addition, the convergent validity was tested by examining the composite reliability (CR) and the average variance extracted (AVE) for the measures (Hair et al., 1998). As shown in Table 3, the CR scores exceeded the threshold of 0.70 (Nunnally, 1978), and the AVE values were above 0.50 (Fornell & Bookstein, 1982), thus providing initial support for the convergent validity of the construct measurement. The results of the discriminant validity analysis confirmed the construct validity (Fornell and Bookstein, 1992) (see Table 4) by comparing the square roots of the AVE for each factor within the inter-construct correlations associated with that factor. In Table 4, the diagonal elements (bolded) represent the square roots of variance shared between the constructs and their measures (AVE), and the off-diagonal elements are the correlations among constructs. To support discriminant validity, the diagonal elements should be larger than the off-diagonal elements.

Table 5 presents the overall fit measures of the SEM model and supporting literature. The model's goodness fit indexes were: Chi squared = 1.717; RMSEA = 0.081; GFI = 0.0953; CFI = 0.972; IFI = 0.973; TLI = 0.945; NFI = 0.938; SRMR = 0.039. According to these results, these indexes reached an acceptable and desired level (please see cut-off values for each index on Table 5).

According to the results, Hypotheses 1, 3, 5, and 6 were accepted, whereas Hypotheses 2 and 4 were rejected (see Table 6 and Fig. 2). Hence, the analysis confirmed that the IG perceived ease of use had a positive influence on IG perceived project usefulness (H1: $\beta = 0.425$, $\rho = 0.004$) but did not influence IG project satisfaction or perceived learning outcomes (H2: $\rho = 0.346$; H4: $\rho = 0.605$). Furthermore, IG perceived project usefulness had a positive influence on both IG project satisfaction and perceived learning outcomes (H3: $\beta = 0.695$, $\rho < 0.001$; H5: $\beta = 0.362$, $\rho = 0.018$). Finally, BBA students' satisfaction had an influence on perceived learning outcomes (H6: $\beta = 0.537$, $\rho < 0.001$).

5. Discussion

Although the use of social media tools in higher education has become a popular research topic, the empirical research evidence for the utility of IG as a useful tool that can support the learning process in higher management education is scant and inconclusive, especially in the field of BBA studies. This study fills this research gap by evaluating a research model based on the TAM that explores whether the perceived ease of use and perceived usefulness of IG enhance BBA students' satisfaction and, consequently, learning outcomes.

The results confirm that the perception of IG project usefulness has a positive influence on BBA students' satisfaction. This result is consistent with those of similar studies that have demonstrated the positive effect of IG usage in learning (Essig et al., 2020). In addition, the results provide strong evidence that the perception of IG project usefulness has a positive influence on students' perceived learning outcomes, highlighting that the use of IG is a valuable resource for increasing BBA students' engagement in the learning process. This result is also consistent with the literature (e.g. Al-Bahrani & Patel, 2015; Diao & Hedberg, 2020; Fornara & Lomicka, 2019) and also with the fact that IG is the social media platform preferred by Generation Z (IAB Report, 2022). In this regard, the project responds to the need for promoting digital literacy (Hashim et al., 2022; Shurygin et al., 2022) and using smartphones as an innovative approach (Orji et al., 2022) that can attract Generation Z, who prefer more interactive educational methods (Flom et al., 2023). This result is also related to the idea that visual content (as offered by IG) enhances students' retention of information (Al-Bahrani & Patel, 2015; Fernández-Díaz et al., 2021).

The results also show a positive influence of IG project satisfaction on students' perceived learning outcomes, in accordance with the findings of similar studies (AlFaris et al., 2018; Hortigüela-Alcalá et al., 2019). Recalling that BBA students in Generation Z are characterized by being interactive (González-Hernando et al., 2020) and are highly focused on visual content (Fernández-Díaz et al., 2021; García-Ruiz et al., 2018), they might consider a subject easier to study if the learning process allows for the use of smartphones and social media applications (Nurkhin et al., 2020). Therefore, this project reiterates previous recommendations to make universities "mobile-ready" (Mikum et al., 2018) by combining formal and informal learning techniques and promoting digital literacy (González-Hernando et al., 2020).

Finally, the model explains the influence of IG perceived ease of use on the other constructs. There is strong evidence for the positive influence of IG ease of use on IG perceived project usefulness confirming the results of previous studies, such as Hoang et al.

Table 4
Assessment of discriminant validity.

Variables	1	2	3	4
1. Perceived IG ease of use	0.736			
2. Perceived IG project usefulness	0.425	**0.853**		
3. Perceived learning outcomes	0.32	0.738	**0.79**	
4. IG project's satisfaction	0.408	0.743	0.784	**0.808**

Table 5
Fitness index for the full model.

Measure	Cut-off values	Results		Supporting literature
Chi square/df	<2	1.717	Good	Byrne (1989)
RMSEA[a]	<0.1	0.081	Acceptable	MacCallum et al. (1996)
CFI[b]	>0.90	0.972	Excellent	Hu and Bentler (1999)
IFI[c]	>0.90	0.973	Excellent	Hu and Bentler (1999)
NFI[d]	>0.90	0.938	Good	Hu and Bentler (1999)
TLI[e]	>0.90	0.945	Good	Hu and Bentler (1999)
GFI[f]	>0.95	0.953	Good	Hooper et al. (2008)
SRMR[g]	≤0.05	0.039	Good	Hooper et al. (2008)

[a] Root mean square error of approximation.
[b] Comparative fit index.
[c] Incremental fit index.
[d] Normed-fit index.
[e] Tucker-Lewis index.
[f] Goodness-of-fit index.
[g] Standardized root mean square.

Table 6
Results: loadings and validation.

Hypothesis	Loadings	P	Validation
H1 (PEU → PU)	**0.425**	**0.004****	**Accepted**
H2 (PEU → SAT)	0.113	0.346	Rejected
H3 (PU → SAT)	**0.695**	**0.000*****	**Accepted**
H4 (PEU → PLO)	−0.053	0.605	Rejected
H5 (PU → LO)	**0.362**	**0.018***	**Accepted**
H6 (SAT → PLO)	**0.537**	**0.000*****	**Accepted**

***, **, and * indicate ρ < 0.001, ρ < 0.01, ρ < 0.05, respectively.

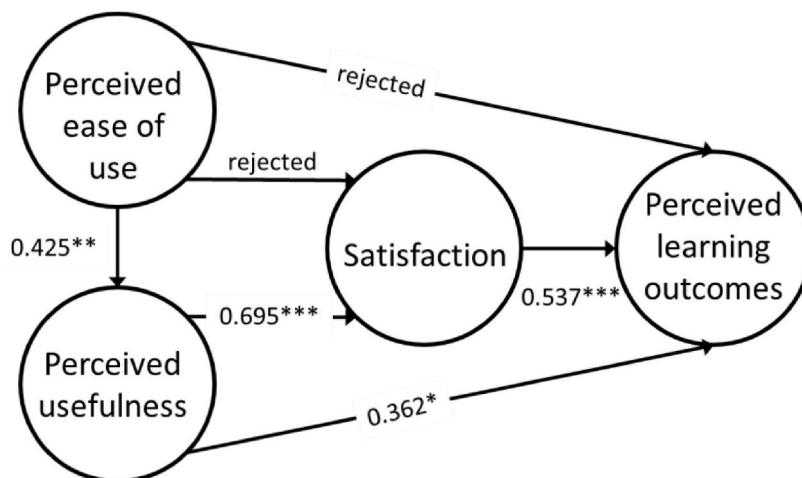**Fig. 2.** Results of the structural model
***, **, and * indicate ρ < 0.001, ρ < 0.01, ρ < 0.05, respectively.

(2021), Tavera-Mesias et al. (2022) or Zahrani (2021), among others. This result is in line with the findings reported by previous studies on the relationship between social media and learning in higher education (e.g. AlFaris et al., 2018; Nurkhin et al., 2020) and is probably related to the focus of Generation Z on visual content and the omnipresence of smartphones in their daily lives (García-Ruiz et al., 2018). However, although previous studies have identified a positive impact of IG perceived ease of use on students' satisfaction and perceived learning outcomes, this study did not find a significant relationship. These results are in line with Davis (1989), who explained that the perceived ease of use may be an antecedent to usefulness, rather than being parallel constructs. Thus, the perceived ease of use of IG is considered an enabler to be followed by the project. The lack of significance may be attributable in part to the fact the IG perceived ease of use is not specifically related to the IG project. Alternatively, this result may be related to the fact that people belonging to Generation Z are digital natives, that is, they use social media regularly, and consequently perceive all social media

platforms as easy to use; thus, the perceived ease of use does not affect their satisfaction level because perceived ease of use simply might not play any role for them - it is just natural to them-. Meanwhile, students belonging to other generations value simple social media platforms more because they do not have digital skills as developed as Generation Z.

In short, the results of the current study contribute to the literature on the use of social media in higher education by analysing an underexplored tool. Specifically, it sheds the light on the value of this learning tool in the field of management teaching. Finally, this paper contributes to the scarce literature on IG as a learning tool in higher education by adapting the TAM to devise and test a model confirming IG as a useful tool for instructors.

6. Conclusion

The present study builds upon the literature examining the impact of implementing an IG project in the educational domain by demonstrating that the use of IG as a complementary educational tool can directly foster BBA students' sense of social connectedness and increase their perceived learning outcomes and satisfaction. Our findings provide further evidence that the use of IG as a complementary educational tool can bring positive outcomes for BBA students in higher education. Future research should corroborate these findings using different samples from other Universities.

Our results have implications for practice because they are based on a real-life case study. First, instructors interested in the use of IG to improve BBA students' perceived learning outcomes should note that when students perceive IG usefulness, they are more satisfied and achieve better learning outcomes. To increase perceived usefulness and satisfaction, instructors should pay close attention to information quality when designing the course content (Eom & Ashill, 2016). Second, the results highlight the importance of using social media platforms to support the learning process. At present, social media platforms are in every aspect of people's lives, and instructors should take advantage of this new reality to achieve learning purposes; the current study presents a possible starting point. Finally, considering the few studies on IG projects for educational purposes, especially in certain fields (e.g. business, engineering, law), the model presented in this study could be valuable to instructors in any field who are interested in the use of social media to enhance the learning process, as it highlights the influence of IG projects on perceived results.

Despite these contributions, the present work is not without limitations, which provide opportunities for further research. First, the study is cross-sectional in nature, and it could be interesting for future studies to capture possible changes in BBA students' perceptions over time in longitudinal settings. Second, although the sample size is similar to other comparable papers published in the field (e.g. Boubker et al., 2021; Choi et al., 2022), it could be interesting for future studies to use larger samples. Third, this study was conducted with BBA students from the same culture and social structure. Different results may be achieved if the same study is carried out with students from different cultures and social structures. Fourth, the results were obtained from an IG project, and may be different for alternative social media platforms. Fifth, future research could use the subsequent revisions of TAM to analyse other variables related to social influence and cognitive instrumental processes. Finally, in line with recent studies considering the negative impact of social media, future research could analyse the negative effect of using IG as a supplementary tool to promote learning in higher management education on students' attention (Nema et al., 2023) and health (Bozzola et al., 2022; Lup et al., 2015; Pellegrino et al., 2022).

CRediT author statement

María Obeso: Conceptualization, Methodology, Software; Marta Pérez-Pérez: Validation, Investigation, Writing, Visualization; Gema García-Piqueres: Investigation, Writing, Supervision; Ana M. Serrano-Bedia: Writing, Supervision.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

Data will be made available on request.

Appendix A. Constructs, items, and literature

Constructs	Items	Sources
Perceived IG ease of use	PEU1. I find IG easy to use.	Sarwar et al. (2018)
	PEU2. It is easy for me to become skilled at using IG.	Al-Adwan et al. (2020)
Perceived IG project usefulness	PU1. I find the IG project useful to study strategic management.	Al-Adwan et al. (2020)
	PU2. Using an IG project enables me to accomplish tasks more quickly.	Pérez-Pérez et al. (2020)
Perceived learning outcomes	PLO1. The IG project has improved my overall learning performance.	Al-Adwan et al. (2020)
	PLO2. The IG project has improved my grade for the subject.	Pérez-Pérez et al. (2020)
		Sarwar et al. (2018)

(*continued*)

Constructs	Items	Sources
Students' satisfaction	SAT1. In general, following the IG project gave me a sense of satisfaction.	Pérez-Pérez et al. (2020)
	SAT2. If asked, I would probably recommend the use of IG to support the learning process.	Henry et al., 2020

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