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Satisfaction with the institution as a predictor of the intention to drop out in online higher education

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ABSTRACT

Enrollment in online higher education (OHE) programs has witnessed a substantial increase, owing to the benefits and added value it offers students. However, one of the main challenges in this educational modality is attrition. While research on attrition in online settings is plentiful, studies on student satisfaction with higher education institutions (HEIs) in these settings are still nascent. Therefore, this article aimed to assess the impact of student satisfaction with HEIs on their intention to drop out in the OHE environment, seeking to identify specific constructs that influence student satisfaction in this educational modality. To achieve this, a partial least squares structural equation modeling was employed to examine the relationship between satisfaction with the institution and the intention to drop out. The model was parameterized using data from a sample of 524 participants across the 32 departments of Colombia. The study revealed that satisfaction with various aspects of OHE variably affects overall satisfaction with the HEI and the intention to drop out. Despite significant effect sizes, the lack of statistical significance in certain areas suggests further research. These findings are crucial for developing strategies to improve the educational experience and reduce attrition in OHE.

ARTICLE HISTORY

KEYWORDS

Satisfaction; attrition; virtual learning; higher education; higher education institutions

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Introduction

Online higher education (OHE) has seen a substantial global increase in enrollment (Johnson, 2019; Shaikh & Asif, 2022), driven by the growing student demand for such programs (Shaikh & Asif, 2022). In this context, Irwin et al. (2022) estimated that in the United States, online educational programs experienced an annual student enrollment growth of 3.7%, with an even higher rate of 3.9% for postgraduate programs. This phenomenon is not limited to developed countries but is also evident in developing nations. For instance, Colombia experienced a 49.2% increase in students enrolled in online programs from 2020 to 2021, rising from 251,388 to 375,086 students (Ministry of National Education, 2022).

Students opt for online programs for various reasons, including the flexibility of studying at their own pace and tailoring study schedules to personal and work responsibilities (De Souza et al., 2022; Evans et al., 2023; Martínez-Daza et al., 2021; Noguera Fructuoso et al., 2023; Seaman et al., 2018); accessibility, which allows studying at any higher education institution (HEI) globally, overcoming geographical and logistical limitations associated with traditional education, and lower costs in terms of tuition and other educational expenses (Friedman & Deek, 2003; Heydari et al., 2023; Limperos et al., 2015; Segovia-García & Martín-Caro, 2023); and the opportunity to interact with cutting-edge technologies like online learning platforms, collaborative tools, and interactive multimedia resources (Martínez-Daza, 2022), among others.

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Despite the increasing demand and reasons for choosing OHE, attrition remains a significant challenge (Bağrıacık Yılmaz & Karataş, 2022; Gaytan, 2015; Guzmán et al., 2021a; Meneses & Marlon, 2020; Orellana et al., 2020; Radovan, 2019). The dropout rate is often higher in virtual education programs than in traditional ones (Bağrıacık Yılmaz & Karataş, 2022). For example, in Colombia, recent reports indicated a dropout rate of 61.96% in virtual programs compared to 48.68% in traditional ones (Ministry of National Education, 2022), and in Australia, the undergraduate dropout rate in this modality was estimated at 20%, 2.5 times higher than in traditional education (NCSEHE, 2020).

Attrition has negative consequences for both students and HEIs. In the case of virtual students, this phenomenon implies lost educational opportunities (Bertola, 2023), debt from educational loans to finance tuition and associated expenses (Ghignoni, 2017; Guzmán et al., 2021b; Moreno et al., 2019), limited skill and knowledge acquisition or enhancement (Hällsten, 2017; Sosu & Pheunpha, 2019), and difficulty accessing better jobs or wages (Njifen, 2023). For HEIs, the negative consequences of attrition include reduced income from tuition, affecting their core functions and administrative processes (Guzmán & Barragán, 2022; Voelkle & Sander, 2008), as well as their reputation and prestige, as high dropout rates can generate negative perceptions among future students, employers, and the general community (Arias Ortiz & Dehon, 2013). Moreover, attrition can hinder the achievement of institutional goals and the mission to provide quality education (Voelkle & Sander, 2008).

In this context of high attrition rates in OHE programs, the academic community has been exploring the variables that explain attrition in this educational modality (Orellana et al., 2020). Previous studies have indicated that men are more likely to drop out due to work obligations (Cochran et al., 2014; Guzmán et al., 2021a; Shea & Bidjerano, 2016), while for women, the decision to drop out is primarily associated with family obligations (Hamdane et al., 2023; Shea & Bidjerano, 2016). The age of entry into OHE (Guzmán et al., 2021a; Packham et al., 2004) has also been considered a determinant in dropout, with a higher likelihood of dropping out as the age of entry increases (Guzmán et al., 2021a) due to its association with competing family and work responsibilities (Guzman et al., 2023). Economic issues directly impact dropout in OHE, as Segovia-García et al. (2022) pointed out, where the student's or their family's low economic status hinders the ability to afford tuition and related costs (e.g. books, internet, computer, etc.).

Academically, the literature has shown that high school GPA and GPA in the same virtual undergraduate level are inversely correlated with the intention to drop out (Hachey et al., 2014; Shaikh & Asif, 2022). Similarly, other predictors of dropout in OHE include the number of prior courses (continuing education) taken in this modality (Grau-Valldosera & Minguillón, 2014; Hachey et al., 2014); the number of courses students enroll in each semester (Lee et al., 2019); and the role of the teacher and the interaction between the student and the teacher (Segovia-García et al., 2022).

In terms of research on dropout in OHE, it has been established that satisfaction with the HEI is a significant predictor of the intention to drop out (Nurmalitasari et al., 2023; Segovia-García et al., 2022). However, understanding this relationship faces certain gaps that demand more thorough exploration and analysis. One such gap is the lack of consensus on the specific constructs that influence student satisfaction in virtual training programs (Vázquez & García, 2022; Wong & Chapman, 2023), which has only recently begun to be addressed through the simplification of available evidence, as shown by Martin and Bolliger (2022). This issue has resulted in research on satisfaction in this modality relying on instruments that offer a biased evaluation, not considering the complex interaction among the multiple services that HEIs provide. An example of this limitation is found in the study by Conrad et al. (2022), which assessed satisfaction using only three items focused on academic aspects, overlooking how interaction with services like admissions, mentoring, and financial support, among others, affects overall student satisfaction. This situation is similarly presented in the studies by Coman et al. (2020); Dangaiso et al. (2022), Segovia-García et al. (2022), and Selvanathan et al. (2023).

The second gap relates to the limitations of previous studies that have focused their efforts on specific cases of HEIs (e.g. Bernardo et al., 2022; Xavier & Meneses, 2022), making it difficult to generalize findings to broader contexts. In the same vein, the third gap refers to the absence of an evaluation of the effect size in the few quantitative studies on the relationship between satisfaction and dropout in the virtual modality, making it impossible to generalize the results obtained from this relationship so far. Indeed, these gaps in research highlight the need for additional studies that address these issues and

contribute to a better understanding of the relationship between student satisfaction and the intention to drop out in OHE.

In this context, the objective of this article was to assess the impact of student satisfaction with HEIs on their intention to drop out in the OHE environment, seeking to identify specific constructs that influence student satisfaction in this educational modality. This information is vital for HEIs, as it allows them to adjust their programs and services to enhance the student experience and, consequently, reduce dropout rates. Additionally, this study contributes to filling the existing gaps in the academic literature on student satisfaction in virtual education, offering a more comprehensive and detailed framework for future research in this field. Furthermore, considering the complexity of this educational phenomenon and the different perspectives that analyze it, the study is framed within the organizational approach due to how satisfaction is addressed, a choice justified in the theoretical framework.

This article is structured into five sections. The first section discusses the conceptualization of dropout and satisfaction, describing the constructs that make up the latter as documented in OHE literature. The second section presents the reference model. The third describes the methodology and context in which this study was conducted. The fourth section presents the results and the overall evaluation of the model. The fifth discusses the findings, and the last section presents the conclusions.

Theoretical framework

Conceptualization of dropout

Dropout in education is characterized as a complex phenomenon, resulting from the interplay of multiple variables (Guzman Rincón et al., 2023), thus requiring a clear and uniform definition for its understanding (Xavier & Meneses, 2022). However, the literature still lacks such a definition, and instead, the conceptualizations are diverse and heterogeneous, influenced by various academic, political, and social actors studying this educational phenomenon (Barragán & Gonzalez, 2022; Guzmán et al., 2021b). Dropout conceptualizations can be grouped into operational and theoretical definitions. Operational definitions are more pragmatic, focused on specific criteria such as non-enrollment in an academic period or non-completion of an educational program, and are used for counting the students who drop out (Guzmán et al., 2022a). In contrast, theoretical conceptualizations consider dropout from a broader perspective, integrating variables influencing a student's decision to abandon their studies (Behr et al., 2021; Guzmán et al., 2022a). This perspective is fundamental in establishing a basis for modeling and understanding the phenomenon (Guzmán et al., 2021a).

This article focuses on theoretical definitions of student attrition, exploring how these definitions address dropout as not an isolated act, but the outcome of a complex and multifaceted process. Early studies conceptualized dropout as a result of poor integration of students into the higher education environment, caused by limited family support and low normative congruence (Spady, 1970), a definition based on the sociological approach that originated dropout studies. Subsequently, from a psychological perspective, Fishbein and Ajzen (1975) defined dropout as the result of weakening initial intentions, associated with a personality trait. During the 1970s, sociological and psychological approaches predominated in conceptualizing dropout.

However, later emerged productivity and interactionist approaches. Bean (1986), from the productivity perspective, described dropout as a reaction to dissatisfaction in the school environment and the beliefs influencing behavioral intentions. Meanwhile, from an interactionist perspective, Tinto (1987) conceptualized dropout as the degree of alignment between the student and their commitment to the training program, educational objectives, and institutional commitment, interpreting abandonment as an imbalance between perceived benefits and individual costs.

During the 1990s, new approaches to understanding dropout emerged, such as the ecological approach, which considers dropout as the difficulty in completing higher studies due to the interaction of different elements in the environmental and social strata (Bronfenbrenner, 1996); and the organizational approach, where early completion of studies results from the student's experience regarding the organization of the institution, the services offered, the quality of teaching, complementary activities, and academic support (Berger & Braxton, 1998). The present study is framed within this latter definition.

The organizational approach posits that a student's decision to drop out is significantly influenced by their perception and experience concerning the structure and functioning of the educational institution (Basque & Pudenko, 2010; Berger & Braxton, 1998; Wohlgemuth et al., 2007). Within this approach, satisfaction with the institution emerges as an integral component (Martin & Bolliger, 2022). When students feel satisfied with their institution, they are more likely to develop a sense of belonging and commitment to it. This satisfaction relates not only to the quality of teaching and academic resources but also to organizational aspects such as the efficiency of the admission process, student support and follow-up, and opportunities for participation in extracurricular activities, among others (Kanwar & Sanjeeva, 2022; Martin & Bolliger, 2022; Rodríguez Gascó et al., 2022). Thus, a student who perceives that their needs and expectations are met by the institution is less likely to consider dropping out.

Conceptualization of satisfaction

Student satisfaction is recognized as a fundamental element in students' educational journey, especially in OHE, directly and indirectly affecting motivation, learning, performance, as well as retention and timely graduation (Martin & Bolliger, 2022). In models such as Moore's (2005), student satisfaction has been considered a pillar of quality in online education. Satisfaction is defined as individuals' perception of the extent to which their needs, goals, and desires have been fully met (Mohammadi, 2015). Thus, satisfaction results from the experiences students have both in the teaching-learning process and with the ancillary services offered by the departments that make up HEIs (Yunusa & Umar, 2021).

Satisfaction as a construct is complex because its global perception is affected by students' experiences throughout their academic journey. In the literature, the influence of four major conglomerates of variables on student satisfaction in OHE has been recognized (Martin & Bolliger, 2022). The first conglomerate focuses on the individual characteristics of the student and their direct impact on satisfaction with HEIs. This category includes variables such as student anxiety (Abdous, 2019), agency (Dziuban et al., 2015), access to technology (Noviyanti, 2019), learning styles (Cole et al., 2014), cultural differences (Zhu, 2012), gender, academic average, age, ethnic origin, and academic level (Andersen, 2013), among others.

The second conglomerate of variables centers on the role of the instructor, encompassing both their personal characteristics and their teaching and learning methods. Regarding the instructor's characteristics, studies have emphasized the importance of the instructor's empathy (Parahoo et al., 2016), genuine interest in student learning (Dias & Trumpy, 2014), and accumulated teaching experience (Al-Asfour, 2012) as crucial variables influencing students' satisfaction perception. As for teaching and learning methods, various studies have highlighted the importance of effectiveness in the use of online lectures and the instructor's time commitment in the educational process (Kane et al., 2015) as key variables for student satisfaction. Additionally, the manner in which instructors behave and act during teaching sessions (Jackson et al., 2010) significantly impacts how students perceive and value their educational experience. The instructor's availability and response time (Bickle et al., 2019), the quality and relevance of feedback provided (Ladyshevsky, 2013), and the overall quality of teaching (Bickle et al., 2019) are other variables that directly affect student satisfaction with the HEI.

The third conglomerate refers to the development of courses in OHE and their direct influence on student satisfaction. Studies have highlighted the importance of various fundamental aspects in this area, such as adequate course orientation, as pointed out by Watts (2019), well-defined course structure (Cole et al., 2014), and clarity of content (Yelvington et al., 2012). In addition, effective use of multimedia in teaching (Garratt-Reed et al., 2016) and the usability of educational platforms (Ilgaz & Gülbahar, 2015) significantly improve students' perception of satisfaction. Likewise, effectively designed instructional activities (Segovia-García et al., 2022) contribute to student satisfaction. On the other hand, variables such as the selection and use of appropriate technologies (Al-Azawei & Lundqvist, 2015; Gomezelj & Čivre, 2012) are essential for facilitating learning. The methods of assessment used (Cassidy, 2016; Kurucay & Inan, 2017) and the quality of the course content (Shin & Cheon, 2019) also play a significant role in student satisfaction.

The fourth and final conglomerate focuses on organizational nature variables. Although studies in this area are less abundant, the significant influence of several organizational constructs on student satisfaction has been recognized. Machado-da-Silva et al. (2014) highlighted the quality of information and service, as well as infrastructure support, as central variables for the satisfaction of students in virtual

modality. Similarly, Lee et al. (2011) emphasized the importance of instructional support, peer support, and technical support. Other variables, such as the authenticity of the educational program (Gyamfi & Sukseemuang, 2018), the university's reputation (Harvey et al., 2017), the quality of the educational environment (Guest et al., 2018), the appropriate duration of courses (Ferguson & DeFelice, 2010), and the availability of self-paced programs (Gyamfi & Sukseemuang, 2018), are also determinants in student satisfaction.

It's crucial to understand that the variables explaining student satisfaction do not function in isolation but interact dynamically and complexly, influencing the student's perception of satisfaction with the institution. For example, student anxiety (Abdous, 2019) can be mitigated or exacerbated depending on the approach and empathy of the instructor (Parahoo et al., 2016). Similarly, the quality of the content (Shin & Cheon, 2019) and the usability of the platform (Ilgaz & Gülbahar, 2015) can significantly impact the student's motivation and academic performance. Given that this article focuses on the organizational aspects of HEIs that influence satisfaction, the model proposed in the subsequent section does not incorporate the first conglomerate of student characteristics.

Reference model

Construction of satisfaction with virtual HEIs

In virtual education, the instructor's role transcends mere knowledge transmission to include creating an interactive and enriching learning environment. As per Martin and Bolliger (2022), the instructor's characteristics and teaching methods significantly contribute to student satisfaction. Thus, the instructor's empathy, interest in the learning process, and teaching experience are central in impacting overall satisfaction with HEIs (Al-Asfour, 2012; Dias & Trumpy, 2014; Parahoo et al., 2016). Additionally, the quality of teaching and feedback from the instructor directly correlates with higher satisfaction (Bickle et al., 2019; Ladyshevsky, 2013). These elements, when perceived positively, reinforce the notion that a competent and committed instructor significantly contributes to a satisfying educational experience.

In virtual education, the role of the instructor extends beyond mere knowledge transmission to facilitating interaction, motivation, and student engagement with the course content. The effectiveness with which instructors achieve these objectives affects the overall satisfaction with the HEI. Research, such as that by Jackson et al. (2010) and Segovia-García et al. (2022), has shown that frequent and meaningful interaction between the student and instructor, along with innovative teaching methods, positively impacts student satisfaction. Moreover, the instructor's willingness to address queries and provide constant support (Bickle et al., 2019) is vital in strengthening the student's connection with the institution. Therefore, satisfaction with the instructor's role in virtual classrooms directly impacts overall satisfaction with the HEI.

H1: Satisfaction with the instructor (professor) in OHE directly and positively influences satisfaction with the HEI.

Student satisfaction regarding the instructor's role in OHE is a determining factor in evaluating the course content. In a virtual learning environment (VLE), the instructor is essential not only for imparting knowledge but also for contextualizing and making sense of the course content. According to studies by Jackson et al. (2010) and Ladyshevsky (2013), the instructor's ability to present content clearly, interestingly, and relevantly is directly related to student satisfaction with that content. Teaching methods, the ability to generate meaningful discussions, and effectiveness in integrating multimedia and technological resources (Garratt-Reed et al., 2016; Ilgaz & Gülbahar, 2015) are critical aspects that enhance the student's perception of the course material's quality. Therefore, a competent and engaging instructor can significantly improve students' perception of course content satisfaction, making it more valuable and enriching.

Furthermore, the instructor's interaction with students and their ability to adapt and personalize the course content based on their needs and feedback play a crucial role. Research by Bickle et al. (2019) and Segovia-García et al. (2022) has demonstrated that instructors who actively respond to student concerns and adjust their teaching material accordingly not only increase student satisfaction with the

course but also enhance their understanding and retention of the material. This adaptability and attention to student needs reflect a commitment to educational quality that goes beyond mere content delivery, creating a more personalized and satisfying learning experience.

H2: Satisfaction with the instructor (professor) in OHE directly and positively influences satisfaction with the course content.

Regarding the course, it is considered that both the content and the VLE form the perception of satisfaction with this factor. The quality and relevance of course content in OHE are crucial elements that directly determine overall student satisfaction with the course. In OHE, the course content serves not only as a means of knowledge transmission but also as the central axis of the student's educational experience. Studies like those by Shin and Cheon (2019) and Garratt-Reed et al. (2016) have shown that when content is perceived as up-to-date, relevant, and well-structured, students report higher satisfaction with the course as a whole.

H3: Satisfaction with the content in OHE directly and positively influences satisfaction with the course.

The VLE in OHE is a fundamental component that significantly influences student experience and satisfaction with a specific course. The interface, usability, and functionalities of the VLE largely determine how students interact with the content, instructors, and their peers. According to Ilgaz and Gülbahar (2015), ease of navigation, accessibility of educational material, and the effectiveness of communication tools within the VLE are key constructs that enhance the learning experience. Furthermore, studies like those by Machado-da-Silva et al. (2014) emphasize the importance of an intuitive and well-structured VLE, as it facilitates access to educational resources and fosters greater interaction and engagement with the course. Therefore, student satisfaction with the VLE directly translates into higher satisfaction with the course, as an effective virtual environment enhances knowledge absorption and improves the overall educational experience.

Moreover, satisfaction with the VLE also relates to the perception of support and resources available for learning. A VLE offering a variety of educational resources, such as discussion forums, multimedia material, and interactive assessments, contributes to a rich and diverse learning environment. Research by Bickle et al. (2019) suggests that when students feel the VLE provides the necessary resources and support for their academic success, their satisfaction with the course significantly increases. This aspect is particularly relevant in OHE, where the VLE acts as the main medium connecting the student with the content and the learning community.

H4: Satisfaction with the VLE in OHE directly and positively influences satisfaction with the course.

Student satisfaction with courses in the context of OHE plays a crucial role in their overall perception of the HEI. When a student feels satisfied with the quality, content, and delivery of a course, this positive experience influences how they perceive the HEI as a whole. According to Martin and Bolliger (2022), satisfaction with the course is intrinsically linked to various aspects like the quality of teaching, the relevance of the content, and the effectiveness of the VLE. These positive course experiences reinforce the image of the HEI, as students associate their educational success and satisfaction with the capabilities and resources provided by the institution. Moreover, studies like those by Berger and Braxton (1998) have shown that satisfaction with specific course aspects, such as the pedagogical approach and interaction with faculty, contributes to a more favorable perception of the HEI, demonstrating how positive learning experiences in virtual classrooms can strengthen student loyalty and commitment to the institution.

Furthermore, satisfaction with the course acts as an indicator of how the HEI meets the student's academic expectations and needs. OHE requires an adaptive, student-centered educational approach, where the quality of the course is reflected in curriculum design, teaching methodologies, and the provision of administrative and technical support. According to Yunusa and Umar (2021), satisfaction with these elements within a specific course enhances the positive perception of the institution, as students see their academic needs and goals being met.

H5: Satisfaction with the course in OHE directly and positively influences satisfaction with the HEI.

On the other hand, the admission process in virtual HEIs plays a critical role in forming students' initial perceptions of the institution, significantly influencing their satisfaction. Studies like that by

Machado-da-Silva et al. (2014) highlight the importance of the quality of information and service provided during the admission process. An efficient, transparent, and accessible admission process not only facilitates the transition from applicants to students but also establishes a solid foundation for their overall satisfaction with the institution. This aspect is crucial in virtual education, where a student's first interaction with the HEI often occurs digitally. Additionally, research like that by Rodríguez Gascó et al. (2022) underlines that a positive experience during admission can increase the perception of institutional efficacy and support, in turn strengthening the student's organizational satisfaction.

H6: Satisfaction with the admission process in OHE directly and positively influences organizational satisfaction.

In the context of OHE, mentoring, understood as ongoing support and guidance for students in their academic activities, stands out as an essential component that directly influences organizational satisfaction (Segovia-García & Martín-Caro, 2023). Unlike teaching staff, whose main focus is teaching and assessment, mentors concentrate on guiding and assisting students through their learning process, providing personalized support and catering to their specific needs (Orellana et al., 2020). Lee et al. (2011) highlighted the importance of peer support and technical support in virtual education, elements closely related to the mentoring process. Effective mentoring, tailored to individual student needs, can significantly increase their overall satisfaction with the institution, reflecting an organizational commitment to their success and well-being. Therefore, satisfaction with the mentoring process in OHE becomes a key indicator of organizational satisfaction. Martin and Bolliger (2022) emphasize that the student experience in virtual education is profoundly influenced by the quality of interaction and support they receive beyond the classroom. Well-implemented mentoring, ensuring proper follow-up and assistance, reflects the quality and effectiveness of the HEI's organizational services, reinforcing the students' positive perception of the institution. Thus, satisfaction with this specific aspect of the student experience can have a considerable impact on overall organizational satisfaction.

H7: Satisfaction with the mentoring process in OHE directly and positively affects organizational satisfaction.

Student service satisfaction in OHE has been identified as a critical factor in students' organizational satisfaction. Studies by Machado-da-Silva et al. (2014) and Lee et al. (2011) show that the quality of student services - including efficiency and effectiveness in handling requests and providing information - is crucial in forming students' positive perceptions of the institution. This direct relationship between student service satisfaction and organizational satisfaction is fundamental, as it establishes the basis for a positive and enduring educational experience in the virtual modality. Furthermore, Martin and Bolliger (2022) highlight the importance of considering students' experiences with administrative services as an integral component of their overall satisfaction with the institution.

H8: Satisfaction with student services in OHE directly and positively affects organizational satisfaction.

Financial services in OHE play a crucial role in the overall experience and satisfaction of students with their institution. The ability of an institution to provide clear, accessible, and appropriate financing options significantly influences students' perceptions of the institution. Studies by Guzmán et al. (2021b) and Moreno et al. (2019) suggest that financial aspects are a significant concern for students in higher education, especially in the virtual modality, where additional costs related to technology and internet access may arise. An efficient and comprehensive financing service that addresses these concerns and offers practical solutions can increase student satisfaction with the institution, demonstrating an organizational commitment to their well-being and academic success. Authors like Ghignoni (2017) and Sosu and Pheunpha (2019) show that effectively managing educational costs without incurring unsustainable debts is essential for the student's educational experience. Institutions that offer transparent, fair, and student-needs-adapted financing services not only facilitate their access and retention in education but also reinforce their positive perception of the institution.

H9: Satisfaction with financing services in OHE directly and positively affects organizational satisfaction.

Organizational satisfaction within the realm of OHE is a decisive factor in shaping students' overall satisfaction with their HEI. Research by Martin and Bolliger (2022), Berger and Braxton (1998), and Kanwar and Sanjeeva (2022) underscores the significance of organizational elements (e.g. admissions, mentoring, etc.), highlighting how efficient management and a well-structured support environment substantially

contribute to student satisfaction. Furthermore, studies by Lee et al. (2011) and Machado-da-Silva et al. (2014) emphasize that in a virtual environment, where physical interaction is limited, the clarity, coherence, and accessibility of services and resources become crucial to satisfaction with the institution.

Other research, such as that by Ghignoni (2017) and Sosu and Pheunpha (2019), supports the notion that students greatly value the consistency and quality of institutional processes and services, perceiving them as reflections of the HEI's dedication and commitment to its educational mission. Organizational effectiveness, which proactively addresses students' needs and challenges, not only improves immediate satisfaction with specific organizational aspects but also strengthens trust and loyalty towards the institution. This leads to greater overall satisfaction with the HEI, enhancing student retention and improving the institution's prestige and reputation in the educational field, as suggested by studies like those of Voelkle and Sander (2008) and Arias Ortiz and Dehon (2013).

H10: Satisfaction with the organization in OHE directly and positively affects satisfaction with the HEI.

Student satisfaction with HEIs as a Predictor of the intention to drop out in OHE

OHE has gained unprecedented importance in recent years, making student satisfaction a crucial factor for understanding student retention in this modality. Studies like those by Suhre et al. (2007) have highlighted that student satisfaction is strongly linked to the decision to continue or discontinue their studies. In the context of virtual education, satisfaction is multidimensional, involving student characteristics, academic processes, and organizational elements. Researchers such as Li and Carroll (2020) and Ammigan and Jones (2018) demonstrated that the intention to drop out depends not only on student characteristics but also on satisfaction with the study program and academic journey. Ellison & Jones (2019) observed that a decrease in student satisfaction over the year, possibly related to an increase in assessment activities and disillusionment with initial expectations, could lead to student dropout.

It is crucial to recognize that while satisfaction has been a subject of study in the virtual modality, the focus has predominantly been on academic aspects, often overlooking organizational components. The structure and management of HEIs, along with support and administrative services, play a crucial role in the overall student experience and, therefore, in their satisfaction and decision to remain at the institution (Guzmán et al., 2022b; Segovia-García et al., 2022). Recent research has begun to focus on these organizational aspects, revealing that they significantly impact student satisfaction and, consequently, the intention to drop out (Kanwar & Sanjeeva, 2022; Martin & Bolliger, 2022). For example, the quality of information provided, the efficiency of the admission process, student support and follow-up, and opportunities for participation in extracurricular activities are organizational aspects that, if effectively managed, can increase student satisfaction and reduce the likelihood of dropout (Machado-da-Silva et al., 2014; Rodríguez Gascó et al., 2022). Conversely, the absence of these services or their inadequate management can lead to a negative student experience, increasing the risk of dropout.

Thus, the central hypothesis of this study finds support in the literature, but it is crucial to expand the research focus to include not only academic elements but also organizational ones, creating a more holistic model. Recognizing the complexity of student satisfaction in virtual education is essential for designing effective strategies that address the causes of dropout and enhance the overall educational experience to achieve greater retention.

H11: Satisfaction with the virtual HEI directly and positively affects the student's intention to drop out.

Finally, Figure 1 represents the relationship between the 11 hypotheses that make up the proposed model.

Methodology

Design

To achieve the aim, a quantitative cross-sectional study design was chosen. The details of the design in terms of context, sample, instruments, and statistical analysis are described below.

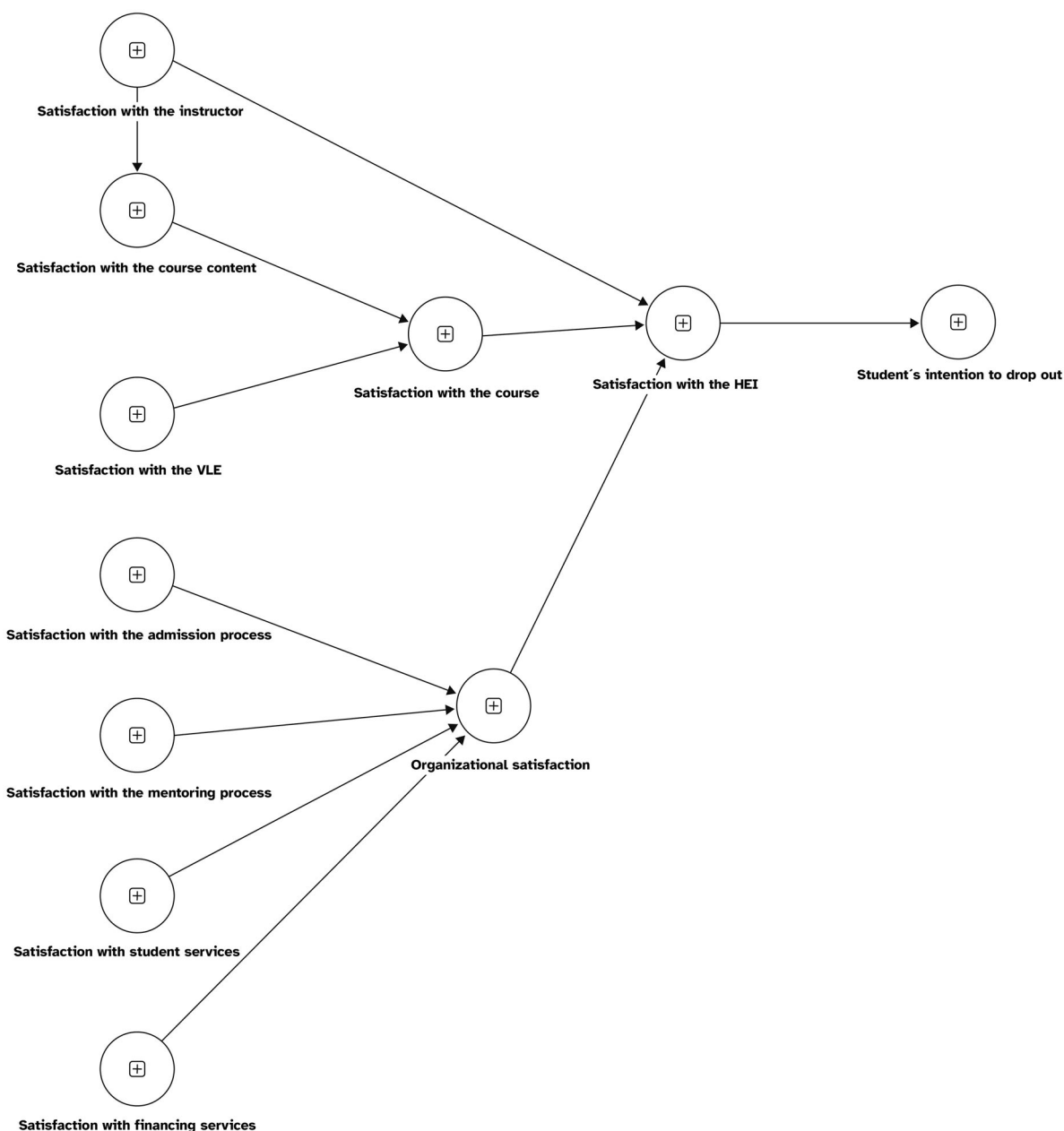


Figure 1. Reference model.

Context

Colombia was selected as the reference country for testing the proposed hypotheses. This choice was motivated by the trend reported by the Ministry of National Education (2022), which indicated a significant increase in enrollments in OHE programs of 49.2% between 2020 and 2021. This surge in virtual education, consistent with global trends identified by Shaikh and Asif (2022) and Johnson (2019), positions Colombia as an ideal setting to investigate student satisfaction with HEIs and their intention to drop out in a virtual environment. The rapid adoption of this modality in Colombia offers an opportunity to analyze how, in a context different from developed countries, student experiences influence satisfaction with HEIs and, consequently, decisions regarding educational continuity.

Additionally, the relevance of this study in Colombia is reinforced by specific concerns about dropout in OHE. According to the Ministry of National Education (2022), the dropout rate in virtual programs in Colombia is high, at 61.96% per cohort, highlighting the need for a better understanding of the constructs behind this figure. Exploring student satisfaction in relation to services and academic quality

offered by HEIs in a context like Colombia can provide key findings to address student dropout. This approach aligns with research by authors like Bağrıacık Yılmaz and Karataş (2022) and Meneses and Marlon (2020), who emphasize the importance of understanding the causes of dropout in virtual education.

Sample

A non-probabilistic sampling method was used for calculating the sample size, following the rule of a minimum of 10 participants per survey question (Hair et al., 2019). This estimated a minimum sample size of 430 participants. Data were collected from 687 Colombian students distributed across the country's 32 departments; however, only 524 completed the entire instrument. Of these, 305 identified as female, 217 as male, and 2 preferred not to disclose. Regarding age, the average of the respondents was approximately 35 years, with a minimum of 15 years and a maximum of 68. In terms of educational programs, 66.44% were pursuing undergraduate studies, while 33.56% were in postgraduate programs.

Before the participation of the sample members, each of them signed an informed consent form explaining the objective of the study, the treatment, anonymisation and use of the data. Finally, a digital signature was made to confirm voluntary participation in the study.

Instrument

Given the focus of previous studies mainly on academic aspects and the limited exploration of organizational aspects of student satisfaction, a survey instrument was developed consisting of 43 indicators. These indicators were designed to evaluate the constructs related to the model presented in Figure 1, using a formative model approach based on literature findings. Each indicator was rated on a scale of 1 to 5, where 1 signified 'strongly disagree' and 5 'strongly agree'. Table 1 presents the constructs, coding of the indicators, the indicators themselves, and the theoretical support for each.

As the reference model is higher-order, constructs like 'satisfaction with the course' and 'organizational satisfaction' were not directly evaluated. Instead, their evaluation was done indirectly through the variables that constitute the exogenous constructs, as explained by Hair et al. (2019). Finally, for the construct of the intention to drop out, the question was, 'Have you ever considered discontinuing your educational process at the HEI where you study?' (Int_D) with 'yes' and 'no' as response options.

Data analysis

In line with the proposed research objective and the reference model (Figure 1), a Partial Least Squares Structural Equation Modeling (PLS-SEM) approach was selected for data analysis. This decision was based on the ability of this modeling technique to explain variance through the testing of hypotheses and latent variables (Lohmöller, 1989). PLS-SEM is a non-parametric method, meaning its algorithm does not rely on the assumption of normal data distribution (Hair et al., 2019; Wold, 1983), making it suitable for the non-probabilistic nature of the sample used in this study (Chin et al., 2020). Furthermore, PLS-SEM is recommended for establishing causal relationships and predicting a target variable (Hair et al., 2019). This makes it particularly suitable for the current study, which seeks to understand the causal links between student satisfaction and their intention to drop out in OHE settings. In Table 2, the results of the Kolmogorov-Smirnov normality tests for the variables in the instrument are presented. This test is used to determine whether the data distribution differs significantly from a normal distribution, which is an important consideration in statistical analysis and particularly relevant in the context of using PLS-SEM.

Based on the study's objective and the organizational focus on satisfaction and attrition, the developed model is formative in nature. This type of model is characterized by the way constructs are conceptualized and measured (Hair et al., 2022). In a formative model, observable variables contribute to the formation of the construct; that is, indicators are viewed as causes of the construct, not as effects of

Table 1. Indicators used in the instrument.

Construct	Code	Indicator	Theoretical Support
Instructor Satisfaction	doc_1	Instructors provide feedback on practical cases	Segovia-García et al. (2022); Ladyshevsky (2013) (Quality and relevance of feedback)
	doc_2	Instructors provide feedback on forum participation	Jackson et al. (2010); Bickle et al. (2019) (Instructor interaction and response time)
	doc_3	Instructors resolve doubts	Bickle et al. (2019) (Availability and response time of the instructor)
	doc_4	Instructors' knowledge allows learning of course topics	Dias and Trumpy (2014); Al-Asfour (2012) (Teaching experience and instructor empathy)
	doc_5	Communication with the instructor is courteous and respectful	Parahoo et al. (2016) (Teacher empathy)
	doc_6	Feedback from the instructor helps improve as a student	Ladyshevsky (2013); Segovia-García et al., (2022) (Quality of teaching and feedback)
	doc_7	Instructors grade assignments on time	Jackson et al. (2010); Bickle et al. (2019) (Efficiency in time use and instructor commitment)
Content Satisfaction	con_1	Course content is clear	Shin and Cheon (2019); Yelvington et al. (2012) (Content clarity)
	con_2	Content is up-to-date	Garratt-Reed et al. (2016); Shin and Cheon (2019) (Relevance and content update)
	con_3	Content is appropriate for the courses	Garratt-Reed et al. (2016); Shin and Cheon (2019) (Relevance and structure of content)
	con_4	Videos, slides, and other interactive materials are error-free	Ilgaz and Gülbahar (2015); Garratt-Reed et al. (2016) (Effective use of multimedia in teaching)
	con_5	Library databases are suitable for their educational process	Yunusa and Umar (2021) (Access to technology and appropriate educational resources)
VLE Satisfaction	eva_1	The platform is easy to navigate	Ilgaz and Gülbahar (2015) (Usability of educational platforms)
	eva_2	The platform has good communication tools	Machado-da-Silva et al. (2014); Ilgaz and Gülbahar (2015) (Efficiency of communication tools)
	eva_3	Course contents download quickly	Garratt-Reed et al. (2016) (Efficiency and accessibility of educational material)
	eva_4	The platform design is attractive	Ilgaz and Gülbahar (2015) (Design and aesthetics of the platform)
	eva_5	The platform allows connection from various devices	Noviyanti (2019); Al-Azawei and Lundqvist (2015) (Accessibility and technological adaptability)
Admission Process Satisfaction	admi_1	Information about the selected program was clear	Machado-da-Silva et al. (2014) (Quality of information and service)
	admi_2	Information about scholarships and discounts was clear	Rodríguez Gascó et al. (2022) (Clarity and transparency in financial information)
	admi_3	Information on dates and payment methods was clear	Machado-da-Silva et al. (2014) (Efficiency of the admission service)
	admi_4	Communication with the admissions advisor was courteous and respectful	Kanwar and Sanjeeva (2022) (Quality of service and student attention)
	admi_5	The payment plan sent by the advisor was clear	Machado-da-Silva et al. (2014); Rodríguez Gascó et al. (2022) (Clarity of service)
Mentorship Process Satisfaction	men_1	Communicating with the mentorship department is simple	Segovia-García and Martín-Caro (2023) (Ease of communication and support)
	men_2	The number of calls made from mentorship are sufficient	Orellana et al. (2020) (Effectiveness of continuous and personalized support)
	men_3	The information provided by mentorship adds value to their educational process	Lee et al. (2011) (Quality of support and educational follow-up)
	men_4	Financial guidance received from mentorship is clear	Segovia-García and Martín-Caro (2023); Guzmán et al. (2021b) (Clarity in financial counseling)
	men_5	Communications from the mentor are courteous and respectful	Martin and Bolliger (2022) (Quality of interaction and personalized support)
Student Service Satisfaction	se_1	Student service resolves requests, complaints, and claims in a timely manner	Machado-da-Silva et al. (2014) (Efficiency and effectiveness in handling requests)
	se_2	Student service resolves requests, complaints, and claims thoroughly	Lee et al. (2011) (Quality of service and student attention)
	se_3	Phone communication with student service is simple	Martin and Bolliger (2022) (Ease of communication and support)
	se_4	Email communication with student service is simple	Martin and Bolliger (2022) (Accessibility and efficiency in communication)
	se_5	Communications from the student service advisor are courteous and respectful	Kanwar and Sanjeeva (2022) (Quality of interaction and treatment of students)
Financing Services Satisfaction	af_1	Payment orders are issued on time by the Corporation	Guzmán et al. (2021b); Moreno et al. (2019) (Efficiency in financial management)
	af_2	Payments made by you are processed on time by the Corporation	Guzmán et al. (2021b) (Agility in processing financial transactions)
	af_3	Academic platform is unblocked on time once payment proof is provided	Sosu and Pheunpha (2019) (Speed in resolving financial issues)

(continued)

Table 1. Continued.

Construct	Code	Indicator	Theoretical Support
HEI Satisfaction	af_4	Communicating with the financial support department is simple	Ghignoni (2017) (Ease of communication with financial services)
	af_5	Communications from the financial support advisor are courteous and respectful	Martin and Bolliger (2022) (Quality of communication and treatment in financial services)
	af_6	Payment agreements with financial support are clear	Guzmán et al. (2021b) (Clarity in financial agreements)
	Sat_admi	Admissions	Not apply
	Sat_men	Mentorship	Not apply
	Sat_af	Financial Services	Not apply
	Sat_se	Student Service	Not apply
	Sat_aca	Academic (instructor, content, and VLE)	Not apply

Note: For the satisfaction with the HEI, the question was, 'Evaluate the service provided by each of the HEI's processes'.

Table 2. Kolmogorov-Smirnov Normality Tests.

Indicator	Statistic	df	P-value
Inte_D	0.381	524	<0.001
Sat_admi	0.391	524	<0.001
Sat_men	0.266	524	<0.001
Sat_af	0.293	524	<0.001
Sat_se	0.294	524	<0.001
Sat_aca	0.322	524	<0.001
admi_1	0.412	524	<0.001
admi_2	0.358	524	<0.001
admi_3	0.436	524	<0.001
admi_4	0.474	524	<0.001
admi_5	0.433	524	<0.001
men_1	0.215	524	<0.001
men_2	0.247	524	<0.001
men_3	0.260	524	<0.001
men_4	0.300	524	<0.001
men_5	0.430	524	<0.001
af_1	0.406	524	<0.001
af_2	0.358	524	<0.001
af_3	0.372	524	<0.001
af_4	0.264	524	<0.001
af_5	0.396	524	<0.001
af_6	0.377	524	<0.001
se_1	0.286	524	<0.001
se_2	0.279	524	<0.001
se_3	0.218	524	<0.001
se_4	0.306	524	<0.001
se_5	0.413	524	<0.001
doc_1	0.337	524	<0.001
doc_2	0.378	524	<0.001
doc_3	0.317	524	<0.001
doc_4	0.357	524	<0.001
doc_5	0.438	524	<0.001
doc_6	0.366	524	<0.001
doc_7	0.365	524	<0.001
con_1	0.366	524	<0.001
con_2	0.357	524	<0.001
con_3	0.393	524	<0.001
con_4	0.351	524	<0.001
con_5	0.363	524	<0.001
eva_1	0.425	524	<0.001
eva_2	0.394	524	<0.001
eva_3	0.447	524	<0.001
eva_4	0.385	524	<0.001
eva_5	0.406	524	<0.001

it (Hair et al., 2019). One of the main advantages of formative models in studying the relationship between satisfaction with HEIs and the intention to drop out is their ability to break down and analyze how each specific component influences the broader construct. In this regard, PLS-SEM formative models are divided into two parts: the measurement model and the structural model. The measurement model in a formative context aims to specify how observable variables compose each of the constructs (Hair et al., 2022). This allows for the validation of the instrument on which data were collected. In the

case of the structural model, the causal relationships between the formative constructs and other constructs in the model, whether formative or reflective, are examined (Hair et al., 2019). This model focuses on analyzing and quantifying the strength and direction of the hypothesized relationships between constructs (Hair et al., 2019; 2022). Also, this model allows determining the variance that exogenous constructs explain over the endogenous ones, the effect size, and the predictive capacity of the model.

Regarding the mediation model, the collinearity of observable variables was first assessed, considering collinearity issues when the VIF statistic value was greater than or equal to 5. The significance of the weights of each variable of the instrument was analyzed using t-values. Any element with values below 1.96 was eliminated, as well as those whose confidence intervals included zero. Finally, the significance of the weights of the factorial loads of each item was assessed. In this case, a p-value lower than 0.05 was required to retain the item. It should be noted that, in case of non-compliance with any of these conditions, the observable variable was removed from the model according to parameters established by Hair et al. (2022). This practice ensures that the final measurement model is composed only of variables that have a significant and non-collinear contribution, which is essential for ensuring the accuracy of the measurement model.

As for the structural model, it is important to note that PLS-SEM does not use traditional fit indicators found in its counterpart CB-SEM (Covariance-Based SEM). In this context, Hair et al. (2019) recommend evaluating the structural model using the Normalized Root Mean Square Residual (SRMR). This index provides a measure of the model fit, where lower values than 0.10 indicate a good fit. Additionally, the explanatory capacity of the model is also used to evaluate the model, this is done through the determination coefficient R^2 .

Once the model was adjusted, the proposed hypotheses were verified using standardized path coefficients. Values close to 1.0 indicate a strong positive relationship, while values close to -1.0 suggest a strong negative relationship. Path coefficients were considered statistically significant if the p-value was lower than 0.05, which provided evidence of the validity of the hypothesized relationships in the model. Additionally, the effect size of the relationships was evaluated using the f^2 statistic. In general terms, f^2 values above 0.02 indicated small effect sizes, values above 0.15 represented medium effect sizes, and values above 0.35 showed large effect sizes. Lastly, the robustness of the model was evaluated using the Q^2 statistic.

It should be noted that, in this research, a 95% confidence interval was used to assess statistical significance. The determination of significances and confidence intervals was carried out using the bootstrapping method, a robust resampling procedure recommended in the context of PLS-SEM analysis. This method involved generating 5000 subsamples to obtain a more accurate and reliable estimation of the model parameters.

Results

The results are presented below in two main sections. The first corresponds to the measurement model, and the second to the structural model. Table 3 presents the descriptive statistics of the variables assessed by the instrument.

Measurement model

Regarding the measurement model, the results are presented in Table 4. It was observed that the observable variables *se_1* and *se_2* need to be excluded from the model due to identified collinearity issues. Additionally, it is recommended to eliminate the variables *admi_3*, *af_1*, *af_3*, *af_6*, *doc_2*, *doc_3*, *doc_6*, *eva_1*, *eva_5*, *men_2*, *men_5*, and *se_4*. This decision is based on the presence of negative outer weights, T-statistic values below 1.96, and confidence intervals (C.I.) that include zero, indicating a lack of statistical significance in these variables. It should be noted that, despite these exclusions, all factorial loadings of the remaining observable variables are statistically significant.

Table 3. Descriptive Statistics of the Indicators.

Construct	Indicators	Mean	Standard deviation
Instructor Satisfaction	doc_1	4.38	0.88
	doc_2	4.49	0.83
	doc_3	4.33	0.90
	doc_4	4.47	0.81
	doc_5	4.67	0.67
	doc_6	4.47	0.86
	doc_7	4.50	0.74
Content Satisfaction	con_1	4.49	0.78
	con_2	4.40	0.89
	con_3	4.55	0.74
	con_4	4.41	0.88
	con_5	4.47	0.79
VLE Satisfaction	eva_1	4.63	0.69
	eva_2	4.55	0.75
	eva_3	4.69	0.63
	eva_4	4.53	0.76
	eva_5	4.54	0.82
Admission Process Satisfaction	admi_1	4.62	0.67
	admi_2	4.41	0.89
	admi_3	4.66	0.68
	admi_4	4.76	0.56
	admi_5	4.65	0.72
Mentorship Process Satisfaction	men_1	3.80	1.18
	men_2	3.98	1.19
	men_3	4.10	1.09
	men_4	4.24	1.02
	men_5	4.63	0.75
Student Service Satisfaction	se_1	4.15	1.11
	se_2	4.13	1.13
	se_3	3.76	1.30
	se_4	4.26	1.01
	se_5	4.59	0.82
Financing Services Satisfaction	af_1	4.56	0.81
	af_2	4.44	0.90
	af_3	4.44	0.94
	af_4	4.06	1.16
	af_5	4.54	0.83
	af_6	4.46	0.91
HEI Satisfaction	Sat_admi	4.58	0.68
	Sat_men	4.17	1.02
	Sat_af	4.19	1.05
	Sat_se	4.19	1.08
	Sat_aca	4.39	0.81

Structural model

The structural model exhibited an adequate fit, as reflected by an SRMR value of 0.085. For satisfaction with content, the R^2 value was 0.529, satisfaction with the HEI was 0.77, and intention to drop out was 0.17. In this context, satisfaction with the instructor had a positive effect on satisfaction with the HEI (H1, $\beta=0.212$, $p\text{-value} < 0.01$) and on satisfaction with the course content (H2, $\beta=0.77$, $p\text{-value} < 0.01$). Moreover, it was found that satisfaction with the content (H3, $\beta=0.58$, $p\text{-value} < 0.01$) and with the VLE (H4, $\beta=0.49$, $p\text{-value} < 0.01$) are positively related to student satisfaction with the course. However, no significant influence was observed of course satisfaction on satisfaction with the HEI (H5, $\beta = -0.032$, $p\text{-value} = 0.481$).

Regarding satisfaction with the admission processes (H6, $\beta=0.365$, $p\text{-value} < 0.01$), mentorship (H7, $\beta=0.408$, $p\text{-value} < 0.01$), student services (H8, $\beta=0.200$, $p\text{-value} < 0.01$), and financing services (H9, $\beta=0.176$, $p\text{-value} < 0.01$), it was revealed that all these dimensions maintain a positive relationship with organizational satisfaction. In turn, organizational satisfaction showed a strong correlation with satisfaction with the HEI (H10, $\beta=0.752$, $p\text{-value} < 0.01$). Finally, it was corroborated that satisfaction with the HEI has a significant association with the intention to drop out in the VLE (H11, $\beta=0.421$, $p\text{-value} < 0.01$). Table 5 presents the C.I., and the results of the bootstrapping process.

For hypothesis H1, the effect size was 0.073, implying a small effect on satisfaction with the HEI ($p\text{-value} = 0.050$), bordering the conventional limit for statistical significance. Satisfaction with the

Table 4. Measurement Model Results.

Indicator	VIF	Outer weights	T	C.I		Loading weights	P-values
				2.5%	97.5%		
Sat_Admi	1.67	0.13	2.56	0.02	0.24	0.70	<0.01
Sat_aca	1.66	0.23	3.63	0.10	0.36	0.73	<0.01
Sat_af	1.56	0.28	4.79	0.17	0.40	0.74	<0.01
Sat_men	1.80	0.23	3.88	0.11	0.35	0.77	<0.01
Sat_se	2.08	0.37	5.45	0.25	0.52	0.87	<0.01
admi_1	1.93	0.43	5.20	0.25	0.58	0.85	<0.01
admi_2	1.68	0.06	2.53	0.01	0.11	0.61	<0.01
admi_3	3.34	0.12	1.35	-0.03	0.31	0.83	<0.01
admi_4	2.65	0.18	2.39	0.03	0.33	0.81	<0.01
admi_5	2.83	0.28	3.64	0.11	0.42	0.81	<0.01
af_1	1.96	0.03	1.59	-0.005	0.08	0.59	<0.01
af_2	1.98	0.18	2.35	0.03	0.32	0.71	<0.01
af_3	2.39	0.10	1.51	-0.03	0.22	0.76	<0.01
af_4	2.11	0.34	4.53	0.19	0.49	0.86	<0.01
af_5	2.28	0.29	4.27	0.14	0.42	0.84	<0.01
af_6	3.82	0.03	0.87	-0.03	0.10	0.73	<0.01
con_1	2.93	0.14	2.19	0.03	0.30	0.81	<0.01
con_2	2.78	0.13	2.27	0.01	0.24	0.77	<0.01
con_3	3.88	0.32	3.16	0.10	0.49	0.92	<0.01
con_4	2.20	0.20	2.17	0.03	0.40	0.79	<0.01
con_5	2.12	0.25	3.37	0.10	0.41	0.83	<0.01
doc_1	3.32	0.32	4.93	0.19	0.46	0.86	<0.01
doc_2	3.18	-0.08	1.13	-0.23	0.07	0.77	<0.01
doc_3	3.15	0.03	0.53	-0.09	0.17	0.81	<0.01
doc_4	3.43	0.36	5.11	0.22	0.51	0.91	<0.01
doc_5	2.70	0.16	2.28	0.01	0.30	0.79	<0.01
doc_6	4.24	0.15	1.53	-0.04	0.33	0.89	<0.01
doc_7	1.90	0.20	3.25	0.07	0.32	0.74	<0.01
eva_1	3.20	-0.06	0.64	-0.25	0.12	0.80	<0.01
eva_2	2.94	0.29	4.04	0.16	0.46	0.80	<0.01
eva_3	2.08	0.37	5.50	0.23	0.50	0.85	<0.01
eva_4	2.50	0.13	2.29	0.02	0.26	0.80	<0.01
eva_5	1.66	0.03	0.90	-0.03	0.10	0.62	<0.01
men_1	3.03	0.38	6.37	0.27	0.50	0.83	<0.01
men_2	2.41	-0.008	0.13	-0.12	0.10	0.72	<0.01
men_3	2.75	0.17	2.39	0.03	0.32	0.81	<0.01
men_4	3.03	0.09	2.29	0.01	0.18	0.78	<0.01
men_5	1.78	0.02	0.87	-0.03	0.09	0.66	<0.01
se_1	5.78	0.17	3.25	0.07	0.27	0.83	<0.01
se_2	5.10	0.07	1.83	0.00	0.15	0.81	<0.01
se_3	1.95	0.07	2.49	0.01	0.13	0.74	<0.01
se_4	3.30	0.02	0.81	-0.03	0.10	0.77	<0.01
se_5	3.05	0.07	2.04	0.004	0.15	0.74	<0.01

Table 5. Hypothesis Testing Results and Confidence Intervals.

Hypothesis	β	Mean of β	C.I	
			2.5%	97.5%
H1	0.212	0.202	0.096	0.310
H2	0.770	0.775	0.699	0.838
H3	0.580	0.589	0.407	0.762
H4	0.490	0.477	0.287	0.661
H5	-0.032	-0.021	-0.111	0.069
H6	0.365	0.363	0.253	0.472
H7	0.408	0.405	0.277	0.546
H8	0.200	0.199	0.082	0.320
H9	0.176	0.177	0.053	0.303
H10	0.752	0.754	0.664	0.837
H11	0.421	0.424	0.331	0.509

instructor and its influence on content (H2) showed an effect size of 1.453, considered a large effect (p -value < 0.001). Hypotheses H3 and H4, although exhibiting very large effect sizes (19.781 and 14.143, respectively), did not reach statistical significance (p -value = 0.086 and p -value = 0.062, respectively). Similarly, satisfaction with the course did not demonstrate a statistically significant influence on satisfaction with the HEI (H5, f^2 = 0.001, p -value = 0.775), suggesting a negligible effect.

Regarding the hypotheses related to organizational satisfaction, H6 and H7 displayed very large effect sizes (19.369 and 18.433, respectively) with statistical significance at 0.032 and 0.056, respectively. For H7, the effect size (18.43) was not statistically significant. For H8 and H9, the effect sizes were large (3.969 and 3.265, respectively), but not statistically significant (p -value = 0.173 and p -value = 0.259, respectively). Organizational satisfaction showed a considerably large effect on satisfaction with the HEI (H10, $f^2 = 1.156$, p -value < 0.01). Finally, the relationship between satisfaction with the HEI and the intention to drop out (H11) presented an effect size of 0.215, indicating a medium and statistically significant effect (p -value < 0.001).

The model overall demonstrates predictive robustness, as the Q^2 value for satisfaction with the HEIs and the intention to drop out was greater than 0, with the statistic being 0.75 and 0.16 respectively.

Discussion

The results of this study provide a comprehensive view of the constructs influencing student satisfaction with their experience in OHE and how this satisfaction relates to the intention to drop out. The structural model shows an adequate fit, with various beta coefficients indicating the strength of the relationships among the studied variables. Although Hypothesis H1 is confirmed with a significant beta coefficient, it is important to note that the effect size is relatively small. This suggests that while satisfaction with the instructor positively influences overall satisfaction with the institution, as emphasized by the findings of Martin and Bolliger (2022) and Segovia-García et al. (2022), the degree of this influence is modest. This outcome is particularly relevant in light of Jackson et al. (2010)'s research, which highlighted the impact of teaching quality and instructor feedback on student satisfaction. Moreover, the confirmation of H2, with a large effect size, aligns with the research of Jackson et al. (2010), Ladyshevsky (2013), Segovia-García et al. (2022), and Martinez-Daza et al. (2021), who emphasized the importance of satisfaction with the instructor and its impact on satisfaction with course content.

Results for H3 and H4, despite showing notably large effect sizes, did not reach statistical significance. This suggests a tendency that, although potentially influential, cannot be confirmed as statistically decisive in the Colombian OHE context. These findings present an intriguing dilemma in educational research in OHE regarding the existence of influences in the educational experience that cannot yet be affirmed with statistical certainty. This questions previous claims made by studies like Shin and Cheon (2019), Garratt-Reed et al. (2016), and Machado-da-Silva et al. (2014), and the model proposed by Martin and Bolliger (2022), which established that course satisfaction depended on satisfaction with the content and the VLE. In relation to H5, this hypothesis is not supported by the study data, contrasting with the expectation supported by authors such as Jackson et al. (2010) and Bickle et al. (2019). This finding suggests that despite the importance of course satisfaction in OHE, it does not correlate with general student satisfaction with the HEI.

For the hypotheses forming the block of organizational satisfaction, H6, H7, H8, and H9 were confirmed. H6 showed a large and statistically significant effect size, aligning with existing literature, as suggested by Jackson et al. (2010) and Bickle et al. (2019), highlighting the importance of students' initial interactions with the institution, especially in the admission process, where the educational offer and its unique values are often explained to students in a virtual mode. In contrast, H7, although showing a large effect size, did not reach statistical significance, indicating that despite the possible importance of mentorship, its direct impact on organizational satisfaction cannot be asserted with certainty. Similarly, for H8 and H9, related to satisfaction with student services and financing services, the effect sizes were large but not statistically significant. This suggests that while these services are valuable components of the student experience, their influence on organizational satisfaction may be more complex. H10 confirmed a direct and positive relationship, with a large and statistically significant effect size, indicating that organizational constructs play a crucial role in overall student satisfaction with the HEI.

As for H11, the central hypothesis of the study, it was confirmed with a medium effect size. This finding corroborates the observations of Suhre et al. (2007), highlighting the strong connection between student satisfaction and their decision to continue or abandon their studies. In OHE, as noted by Li and Carroll (2020) and Ammigan and Jones (2018), this relationship is not solely dependent on individual student characteristics but is also influenced by satisfaction with the study program and academic

trajectory. The explanatory capacity of this relationship in the intention to drop out was 17%; while not extremely high, it is significant in the context of the complexity of student dropout. This percentage reflects that satisfaction with the HEI is a relevant predictor of the intention to drop out, but also underscores the influence of other constructs and variables such as gender (Cochran et al., 2014; Guzmán et al., 2021a; Shea & Bidjerano, 2016), age (Guzmán et al., 2021a), family obligations (Guzmán et al., 2023), economic income (Segovia-García et al., 2022), high school and undergraduate grade average (Hachey et al., 2014; Shaikh & Asif, 2022), and the role of the teacher (Segovia-García et al., 2022), among others. Additionally, the predictive robustness of the model in terms of satisfaction with the HEIs and the intention to drop out.

In general terms, this study significantly advances knowledge in the field of online higher education by directly and thoroughly addressing the gaps identified in previous research regarding the relationship between student satisfaction and the intention to drop out in Online Higher Education (OHE). Unlike prior studies that assessed student satisfaction in a limited manner with biased instruments, this study proposes and validates a comprehensive model that includes multiple variables and constructs, which dignifies and reaffirms the complexity of this variable. By developing and using a more integrative and representative assessment tool for student satisfaction, this study allows for a more accurate valuation of it.

By focusing on a broader analysis and not limiting itself to specific cases of Higher Education Institutions (HEIs), this study extends the applicability and relevance of its findings to a wider spectrum of online education contexts. This is crucial for system-level policies and strategies that aim to improve student retention across different modalities and educational settings. Moreover, this study not only verifies the existence of relationships between the constructs of satisfaction and dropout, but also measures the magnitude of these effects. This allows educational researchers and administrators to understand not only if certain constructs are significant, but how significant they are, which is essential for prioritizing interventions and resources.

Finally, the study's approach within an organizational theoretical framework on how student satisfaction is addressed in HEIs is particularly innovative. This methodologically justifies the inclusion of organizational and support variables, recognizing their impact on student satisfaction and retention. By doing so, it adds an additional layer of depth to the analysis and understanding of how institutional policies and practices directly influence educational outcomes.

Conclusions

This study has thoroughly explored the constructs that contribute to student satisfaction with their institution in OHE and their connection to the intention to drop out. By applying the PLS-SEM model, it has effectively identified and quantified the various constructs that constitute student satisfaction with the HEI, and how this satisfaction influences the decision to continue or discontinue studies. The findings have validated several hypotheses and provided insights into key aspects of student satisfaction in an online learning context.

The study confirmed that satisfaction with the instructor positively influences satisfaction with the HEI and plays a significant role in satisfaction with the course content. This emphasizes the importance of instructors as key facilitators in the online learning experience, suggesting that HEIs should prioritize teaching quality, focusing on faculty's pedagogical skills and their ability to engage students in an online environment. The significance of course content and the VLE in overall course satisfaction highlights the importance of content quality and accessibility. Well-structured, relevant, and accessible content, along with an intuitive VLE, can enhance the learning experience significantly, emphasizing the need for HEIs to focus on these aspects to maintain student engagement and satisfaction. However, the rejection of H5 suggests that students in OHE might be satisfied with specific course aspects, yet this does not necessarily translate into increased satisfaction with the HEI, indicating a complex relationship between course-level and institutional-level satisfaction.

Hypotheses H6, H7, H8, and H9 underscore the importance of support services in organizational satisfaction. These findings stress that beyond academic quality and the experience in the virtual classroom, administrative and support services are crucial in shaping student satisfaction. The effectiveness,

accessibility, and quality of these services are essential for creating a comprehensive and positive student experience. Hypothesis H10 revealed a strong correlation between organizational satisfaction and satisfaction with the HEI, suggesting that students' perceptions of the institution's management and services significantly impact their overall satisfaction. This is particularly relevant in OHE, where direct personal interaction is limited, and many services are managed digitally. Satisfaction with these organizational aspects can be a key indicator of how students value the institution as a whole.

Lastly, the confirmation of H11 demonstrates that overall student satisfaction with the HEI is a critical factor in their decision to continue or drop out, especially since it explains 17% of the intention to drop out. This finding should act as a barometer for institutional strategies, where HEIs must not only offer quality academic programs but also create an environment that fosters student satisfaction with education and services received. The generalizability of this study's findings to contexts outside Colombia presents a varied landscape, reflected in the different effect sizes of the hypotheses. While the significant influence of the instructor on course content satisfaction (H2, large effect) suggests strong generalization across educational environments, the modest correlation between instructor satisfaction and HEI satisfaction (H1, small effect) and the lack of statistical significance in the relationship between course satisfaction and HEI satisfaction (H5) indicate potential variability across different contexts. The large effect sizes in hypotheses related to organizational satisfaction (H6, H7, H8, H9) and the notable relationship between organizational satisfaction and HEI satisfaction (H10) highlight their potential relevance in student satisfaction, though their variability in statistical significance suggests a need for careful evaluation of their applicability in different contexts. The medium and statistically significant effect size of hypothesis H11 suggests a relevant pattern across various educational contexts.

In light of the development of strategies for the prevention and mitigation of dropout rates, based on satisfaction with the institution in the Online Higher Education (OHE) context, the research presented here has demonstrated that student satisfaction with the instructor significantly impacts their overall satisfaction with the institution. Higher Education Institutions (HEIs) can enhance this satisfaction by strengthening the quality of interactions between students and professors. This could be achieved through training instructors in online teaching techniques, including the effective use of synchronous and asynchronous communication tools. Furthermore, promoting a policy of rapid response to student inquiries and establishing clear expectations regarding instructor availability can significantly improve students' perception of support and commitment.

Satisfaction with admission processes has a significant impact on organizational satisfaction. HEIs should simplify and make these processes transparent, using technology platforms that facilitate a seamless user experience from registration to enrolment. Although the hypotheses about student and financial services showed large but not statistically significant effects, improving these services remains crucial. Implementing a user-centred approach to continuously design and enhance these services can aid in boosting overall satisfaction and the perception of institutional support.

The study confirmed that organizational satisfaction plays a crucial role in overall satisfaction with the institution and, by extension, in the intention not to abandon studies. HEIs should focus on strengthening all aspects of the organizational experience, from technological infrastructure to administrative and academic support. This could include implementing mentoring programs that focus not only on academic support but also on emotional well-being and social integration of students, especially in an online education context where personal interaction is limited.

Methodological and contextual limitations of the study include the indirect evaluation of course satisfaction and organizational satisfaction constructs through variables constituting exogenous constructs, potentially limiting the direct capture of participant perceptions in these specific areas. The modeling type, while suitable for explaining variance and establishing causal relationships in non-probabilistic samples, may have limitations, especially without fit indices like CB-SEM. The study's focus on OHE in Colombia may also limit the generalizability of its findings to other contexts.

Future research could explore additional constructs, such as personal characteristics and socioeconomic situations of students, in influencing student satisfaction and dropout intentions, particularly in diverse geographic and cultural contexts. Evaluating interventions to improve student satisfaction and retention, employing various methodological approaches, including qualitative and experimental studies, and investigating the impact of technology and online learning platforms on student satisfaction would

provide a deeper understanding of these dynamics. Examining how satisfaction with specific course aspects relates to overall institutional satisfaction could offer valuable insights for enhancing the OHE experience.

Ethical approval

The Ethics Committee of the University Corporation of Asturias, in its diligent review and evaluation process, has officially granted approval for the application of the instrument in accordance with Resolution 002 of 2023.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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Data availability statement

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to the current Colombian laws that require the signing of a data transfer contract between the 'Corporación Universitaria de Asturias' and the applicants.

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