Student engagement in online learning in Latin American higher education during the COVID-19 pandemic: A systematic review

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Abstract
The COVID-19 pandemic has forced higher education institutions to implement online learning activities based on virtual platforms, allowing little time to prepare and train faculty members to familiarize students with digital technologies. While previous studies have looked at how students engaged with digital technologies in their learning activities, the characteristics of the student engagement in online learning remain underexplored. Therefore, a systematic review of the literature on student engagement in online learning in higher education is much needed. This article synthesizes the findings on student engagement in Latin American higher education institutions during the COVID-19 pandemic. After reviewing the studies on online learning activities, this review examines student engagement from behavioural, cognitive and affective dimensions and identifies the main characteristics of student engagement from these tripartite dimensions. The implications of the findings for online learning in Latin American higher education are as follows: (a) to transform higher education, (b) to provide adequate professional training, (c) to improve Internet connectivity, (d) to ensure quality online learning in higher education and (e) to provide emotional support. These findings will provide...
INTRODUCTION

Over the past few decades, there has been a steady increase in the use of online learning strategies in higher education. Studies, in general, have revealed that online learning seems to offer more benefits to students compared to face-to-face instruction on parameters such as learning gains, satisfaction, learning styles and study habits (Farrell & Brunton, 2020; Paulsen & McCormick, 2020), in spite of challenges in the delivery of online instruction and provision of adequate infrastructure (Adedoyin & Soykan, 2020). Online learning took center
stage in 2020 during the global public health emergency caused by the COVID-19 pandemic (Cucinotta & Vanelli, 2020) as higher education institutions (HEIs) worldwide were compelled to switch to online instruction. The ministries of education in Latin American countries issued the notice to suspend traditional classroom teaching in HEIs and implement online classes (Salto, 2020). This sudden change posed challenges to both teachers and students who were inadequately prepared for online learning because research indicates that engaging students in online learning environment is often more challenging than in traditional face-to-face courses (Gillett-Swan, 2017; Hew, 2016).

Regardless of different learning environments, student engagement has been a focus of many previous educational studies because of its correlation to learning outcomes. More engaged students are considered more likely to be academically successful (Bond et al., 2020). Student engagement is a complex construct commonly understood as the effort that students invest in learning activities, and it is found to be shaped by several factors and the interplay of relationships inside the learning environment. Despite the importance of student engagement, the literature on student engagement in online learning is still sparse (Paulsen & McCormick, 2020). Similarly, in Latin America, although some research has focused on student online learning experiences (Charbonneau-Gowdy, 2016; Chin-Roemer et al., 2011), the characteristics of student engagement in online leaning remain unclear. This study intends to fill the gap in student online engagement through a systematic review of the relevant literature. We hypothesize that student engagement in online learning presents some particular characteristics in the context of the Latin American region during the COVID-19 pandemic, which will enable us to understand the teaching and learning situation of HEIs and provide some insights to improve the quality of online learning.

This article is organized as follows. First, we present the background of student engagement research considering online learning in Latin American HEIs. Next, we describe our research methodology and discuss the results. We then consider the implications of our findings for the future of higher education online learning in Latin America as well as the limitations of the study. Finally, we present the conclusions.

The research questions (RQs) are as follows:

RQ1: What are the main characteristics of student engagement—on the behavioural, cognitive and affective dimensions—in online learning in Latin American higher education during the COVID-19 pandemic?
RQ2: What are the main implications for online learning in Latin American higher education?

BACKGROUND

Student engagement

The concept of student engagement emerged with Tyler’s (1969) notion of “time on task” and Pace’s (1984) focus on the quality of effort. Cognitive psychologists later enhanced the concept by regarding it as a meta-construct associated with students’ academic achievement and positive behavior. Student engagement is defined as the time and energy that students purposefully dedicate to learning activities (Kuh, 2003). Therefore, designing learning activities where students will participate and engage in authentic learning is vital. However, recognizing or measuring the engagement level presents certain challenges. Some approaches for understanding student engagement are, for example, Solomonides’ (2013) relational and multidimensional model of student engagement and Willms et al.’s (2009) model that includes student social engagement, academic engagement and intellectual engagement.
These models did not receive much attention, although the dimension of social engagement can bring some insights.

On the other hand, Fredricks et al. (2004) regarded student engagement as a complex and multidimensional construct that includes three distinct but interrelated dimensions, namely, the behavioural, cognitive, and affective dimensions, where each dimension has some particular characteristics.

Behavioral engagement

Behavioral engagement is the most reported dimension, as it is expressed as explicit and observable behaviors. It is defined in terms of participation, interaction and collaboration, achievement, performance, skill development, and learning activity completion.

Cognitive engagement

Cognitive engagement is related to students' purpose, motivation to learn, effort to understand, self-regulated learning, self-efficacy, perceived ability, critical thinking and reflection, extra effort to learn more and ability to comprehend complex ideas.

Affective engagement

Affective engagement refers to students' attitude toward teachers, peers and courses; value for subject matter and learning circumstances; and feelings of satisfaction and well-being. Thus, affective engagement is the emotional response to the learning activities and learning environment.

Not all of the engagement dimensions are positive; some may be negative, which are referred to as “disengagement.” The behavioral, cognitive and affective elements emerge from students' involvement and interaction during learning activities. There is substantial evidence that student engagement is associated with positive learning outcomes, such as good academic performance, self-regulated learning and well-being (Lin et al., 2019; Martin & Bolliger, 2018; Zhang, 2017).

Student engagement in online learning

Online learning is based on relatively new methods, such as content presentation through the Internet, and it emphasizes digital communication and digital learning resources. Moreover, student engagement is traditionally associated with face-to-face classroom learning. Therefore, student engagement in online learning is a recent research area and thus requires more study (Hu & Li, 2017). Since the pandemic outbreak in 2020, online learning has tremendously expanded in all of the educational levels. Teachers started delivering lessons using online platforms, even without previous training on online learning modalities. Teachers had to reach home-based students and continue teaching through distance learning.

Online learning offers several potential benefits, including the flexibility of time, place, and, more importantly, pace. For example, a facilitator guiding an online asynchronous discussion has the potential to develop students' critical thinking and reflection, which deepens their understanding of the content (Martin & Bolliger, 2018). Other examples of online engagement strategies include introducing learning activities related to communication, collaboration,
discovery and search for information, active listening, and activities that require the direct involvement of students (Knopf et al., 2021; Myers et al., 2014). Understanding what drives learners to engage in online learning activities is important. Based on the engagement dimensions proposed by Fredricks et al. (2004), student engagement in online learning can be explained as follows:

a. **Behavioural engagement**: when online students actively participate in online learning activities.

b. **Cognitive engagement**: when online students show motivation to learn online and demonstrate self-regulated learning.

c. **Emotional engagement**: when online students express and manifest positive attitudes within the online learning environment.

The recent development of learning analytics offers tools for capturing and measuring students' online engagement during the learning process (Salas-Pilco & Yang, 2020) and receiving real-time feedback. For example, multimodal learning analytics capture student engagement data through internet of things (IoT) wearable technology.

**Latin American higher education: Online learning**

Latin America, with a population of approximately 617 million, cuts across North, Central, and South America and includes 19 countries with similar cultural, linguistic and historical backgrounds, which includes Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay and Venezuela. The region is dominated by Spanish speakers, with Brazil as the only Portuguese-speaking country. In the present century, the Latin American higher education had a big expansion of gross enrollment rate in higher education, from 23% in 2000 to 52% in 2017; although, there is still the need to improve the quality of education (Ferreyra et al., 2017). In 2018, approximately 28 million students enrolled in Latin American HEIs, where Brazil and Mexico have the majority of higher education students, 8.7 and 4.6 million students, respectively (World Bank, 2021). The HEIs have been increasing the use of digital tools and virtual platforms not only for local students but also for distance learning students. However, the pandemic outbreak in Latin America forced HEIs to close their physical campuses and start online classes.

Higher education is often characterized by low technology integration. Studies have reported under-utilization of digital resources and marginal integration of new technologies, despite teachers' recognition of the importance of these technologies (Guillén-Gámez & Mayorga-Fernández, 2020; Salas-Pilco & Yang, 2020). For example, in a study on a Chilean university, teachers' and students' dispositions toward technologies were measured as 98% and 87%, respectively, but the teachers reported that technology usage accounted for 81% of their teaching strategy, whereas the students reported that technology usage accounted for only 63% of their learning activities (Cabero et al., 2018). Therefore, HEIs need to support innovative teachers, and governments have to formulate educational policies to support the integration of technology into learning activities.

**METHODOLOGY**

We conducted a systematic literature review to obtain up-to-date information on student engagement in online learning in Latin American HEIs. A systematic review is an explicit
and comprehensive process for identifying and synthesizing results from previous studies to gather evidence and answer RQs (Xiao & Watson, 2019). We follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, which were developed to improve the reporting of systematic reviews (Moher et al., 2015); see Figure 1.
Search strategy

The search strategy comprised three phases—identification, screening, and eligibility—and was guided by the inclusion and exclusion criteria listed in Table 1.

Identification

The following databases were searched because they cover a broad range of educational journals: Web of Science, a major research platform that provides access to leading academic literature; ScienceDirect, a database that contains a comprehensive collection of scientific and technical journals; and Scielo, the largest repository of Latin American journals, with articles in Spanish and Portuguese.

A Boolean search string was used in the initial automatic search; this technique employs keywords to select papers with high precision. This automatic search was performed in July 2021. The search terms were divided into three categories: learning environments (online learning, virtual classroom, distance learning, and remote learning), education level (higher education, university), and pandemic disease (COVID), resulting in the following search strings:

- **Web of Science**: (“online learning” or “virtual classroom” or “distance learning” or “remote learning”) and (“higher education” or “university”) and “covid”. Additional filters: (a) publication year: 2020, 2021, (b) type of document: article, (c) research area: education and (d) journal: only journals related to education were used. This search returned 257 papers.
- **ScienceDirect**: Similar Boolean string and filters were used. This search returned 106 papers.
- **SciELO**: Two strings were used, one in Spanish and the other in Portuguese.
  - In Spanish: ((aprendizaje online) or (aula virtual) or (aprendizaje a distancia) or (aprendizaje remoto)) and ((educación superior) or (universidad)) and (covid). Similar filters were used. The search returned 26 papers.
  - In Portuguese: ((aprendizagem online) or (sala de aula virtual) or (aprendizagem à distância) or (aprendizagem remota)) and ((ensino superior) or (universidade)) and (covid). Similar filters were applied. The search returned 14 papers.
- This identification phase led to the retrieval of 403 articles from the three databases.

Screening

In this phase, the 403 articles identified in the initial phase were manually screened. First, the titles were screened to select potential articles, yielding 174 papers. Eight duplicates were then removed, after which 166 articles remained. Next, the abstracts of these selected

| Inclusion criteria | Exclusion criteria |
|--------------------|-------------------|
| Published between February 2020 and June 2021 | Published before February 2020 |
| English, Spanish and Portuguese languages | Not in English, Spanish and Portuguese |
| By Latin American higher education institutions | Not higher education |
| Empirical, primary research | Not empirical, primary research (eg, review) |
| Online learning (with a focus on student engagement) | No online learning |
articles were screened, and articles were eliminated per the inclusion and exclusion criteria (eg, not empirical, not Latin American higher education institutions), leaving behind 58 articles (Figure 2).

Eligibility

The full texts of the articles were then read to assess their eligibility. It was found that 35 articles were irrelevant (eg, conceptual papers, opinion pieces, content related to teachers with no mention of student engagement). Thus, the selection process finally provided 23 articles for systematic analysis. The PRISMA flowchart (Figure 1) illustrates the identification, screening, and eligibility processes we used.

Data extraction and analysis

Data were extracted by collecting and coding the information in the 23 selected studies. The data were organized based on the title, author(s), publication year, country where the study was conducted, discipline, sample size, and the results obtained on the students’ behavioural, cognitive and affective engagement (Table 2). The articles were read thoroughly, highlighting the sections that described student engagement in online learning. After extracting those sections, they were read again to obtain and separately classify the parts related to each type of student engagement: behavioural, cognitive and affective. The results of this classification are shown in Table 2.

The coding categories of students’ behavioural, cognitive and affective engagement emerged from a hybrid approach combining inductive and deductive processes that involved reading and re-reading of data (Fereday & Muir-Cochrane, 2006). The categories/characteristics emerged from an analysis of each type of student engagement and were refined through a review and re-review of the empirical data. Next, the identified categories and characteristics were combined into themes (Creswell & Poth, 2018). The empirical data obtained from the 23 selected articles were classified by category.

Reliability and validity of the study

Two researchers conducted the procedures and reviewed each article independently. The screening and selection of articles required one-day moderation and training to ensure reliability. The decision-making, guided by the inclusion and exclusion criteria, was straightforward. During data extraction, further moderation was required to highlight the types of student engagement and ensure that the necessary information was included. Next, the two authors coded 20 percent of the selected articles (5 out of 23 articles), and Cohen’s kappa coefficient (1960) was used to measure intercoder reliability: moderate agreement = 0.60–0.79, substantial agreement = 0.80–0.90 and almost perfect agreement = 0.91–1.00 (McHugh, 2012). Comparison of the researchers’ coding results yielded a Cohen kappa coefficient of 0.78, which denotes moderate agreement. The authors then discussed the coding results, reconciled differences and completed the remaining coding. Finally, after one-day moderation and training, each type of student engagement data was coded in the next phase of data analysis. The result was an intrarater reliability of 0.85, which denotes substantial agreement. The minor discrepancy was resolved by discussion, until a full agreement was reached. The themes were then presented using frequency tables (Tables 4–6) and stacked bar charts (Figures 3–5). To ensure the reliability of this study, the selected
| ID | Author(s), Year | Country | Discipline | Sample Size | Student engagement dimensions |
|----|----------------|---------|------------|-------------|------------------------------|
| [1] | Alves et al. (2021) | Brazil | Health sciences | 50 students | Students interacted 405 times (by likes and shares) with the 14 publications made on Facebook. 70% of students reported they have learned the online course content; and 95% reported that the information discussed in the course helped them to select better news sources. 92.5% valued the learned information and shared it with their families, and friends. |
| [2] | Bazán-Ramírez et al. (2020) | Peru | Education | 309 students (222 master’s and 87 Ph.D.) | Ph.D. students perceived less difficulty in the online courses than master’s students. Students showed motivation to learn. Students highly valued online learning benefits and Internet connectivity. Graduate students are teachers and use technology for teaching. |
| [3] | Cárdenas Zea et al. (2021) | Ecuador | Education | 46 master’s students | 94% used social media and developed collaborative skills; only 40% used videos for learning. All of the students perceived themselves to have the skills (at least basic) for using digital tools. 86.95% had a positive attitude toward the virtual platform. |
| [4] | Chávez-Miyauchi et al. (2021) | Mexico | Chemistry | 266 students | 78.2% had technological issues, could not handle technology tools; 43.2% improved their digital skills; 59.8% had excessive amount of work. 76.3% reported online courses have academic advantages. 75.6% reported having a good or excellent disposition toward the online course. |
| [5] | De la Fuente et al. (2021) | Brazil | Health sciences | 27 students (17 graduate and 10 undergraduate) | 66.7% dropped out of the course. 85.2% could create routines in Matlab; 74.1% improved their performance. 66.7% felt comfortable about learning programming through online synchronous activities. |
| ID | Author(s), Year | Country | Discipline | Sample Size | Student engagement dimensions |
|----|-----------------|---------|------------|-------------|-----------------------------|
| [6] | Delgado (2021)  | Mexico  | Computer sciences | 60 students | Collaborative learning supported low- to moderate-performing students; 7% dropped out of the course, greater than the 2% that dropped out of face-to-face classes; Students had higher individual performance in computer science than physics and mathematics; Students positively regarded video resources and the posts in the virtual classroom |
| [7] | Domínguez-Torres et al. (2021) | Colombia | Medicine | 64 students | Active learning in virtual classrooms was similar to that in traditional face-to-face classrooms; The level of self-regulated learning in virtual classrooms was similar to that in traditional classrooms; It did not report on students' response toward online learning |
| [8] | Faria et al. (2021) | Brazil | Medicine | 39 students | Students needed considerable amount of training to ensure that their performance was not affected by the assessment; The prototype was aimed at self-regulated learning; Students assessed the 3D lab with a good degree of usability, having an average score of 75/100 |
| [9] | Flores Ferro et al. (2021) | Chile | Physical education | 542 students | Students showed a positive perception of using online resources and online communication; Students showed no difference in motivation to learn theory or practice online learning modalities; Younger students had a more positive perception of online classes; moreover, the satisfaction level was influenced by Internet connectivity |
| [10] | Lovón Cueva and Cisnero Terrones (2020) | Peru | Letters (humanities) | 74 students | Students slowly adapted to the transition into online learning and sometimes could not adapt to the new modalities; 90.5% perceived difficulties in organizing their own learning; Stress and anxiety affected the mental health of 83.8% of students; 51.4% considered dropping out of the course temporarily or permanently |
| ID | Author(s), Year       | Country               | Discipline                  | Sample Size | Student engagement dimensions                                                                 |
|----|-----------------------|-----------------------|----------------------------|-------------|------------------------------------------------------------------------------------------------|
|    |                       |                       |                            |             | Behavioural engagement                                                                        |
| [11] | Mendoza-Lizcano et al. (2020) | Colombia             | Engineering and science    | 354 students | 94% exhibited excellent performance in learning using social media                            |
| [12] | Molina Gutiérrez et al. (2021) | Ecuador              | Education and law          | 159 students | Access to the virtual platform was easy, but online learning required more work               |
| [13] | Pérez-Villalobos et al. (2021) | Chile                | Health sciences            | 1006 students | 90.4% completed the tasks on time                                                             |
| [14] | Quispe-Prieto et al. (2021) | Brazil, Colombia, and Peru | Accounting and administration | 298 students | Students interacted and communicated with classmates                                           |
| [15] | Realyvásquez-Vargas et al. (2020) | Mexico               | All disciplines            | 206 students | 45.6% improved their grades; 30% improved their teamwork skills, and 32% improved their communication skills |
| ID  | Author(s), Year | Country               | Discipline             | Sample Size | Students engagement dimensions | Behavioural engagement | Cognitive engagement | Affective engagement |
|-----|-----------------|-----------------------|------------------------|-------------|--------------------------------|------------------------|---------------------|---------------------|
| 16  | Rodríguez Fernández et al. (2021) | Cuba                  | Information sciences   | 70 students | Students used collaborative methods with social media and exhibited positive interdependence and interactivity | Students showed high motivation, compromise, and self-regulated learning during online courses | Students appreciated collaborative online learning |
| 17  | Romero Alonso et al. (2020) | Chile                 | All disciplines        | 323 students | Students had time for learning online, and 15% indicated to have Internet connectivity issues | 52% had difficulties adapting to the online format but had high self-concept of their digital skills | Students had a positive attitude toward technology usage |
| 18  | Sandi-Urena (2020) | Costa Rica            | Chemistry              | 53 students | 81% completed activities on data collection, analysis, and interpretation | 83% could apply mathematical knowledge, and 91% could connect experimental results with theory | 65% were satisfied with applying chemistry knowledge into experimentation |
| 19  | Santos et al. (2021) | Dominican Republic    | Education              | 120 students | Students manifested deficiency of adequate technological equipment and lack of Internet access | Students faced difficulties when learning online | 67.1% highlighted the negative aspects of online learning, e.g., isolation-generated stress and anxiety and lack of concentration. They felt uncomfortable studying from home |
| 20  | Sapien Aguilar et al. (2020) | Mexico                | Accounting and administration | 1198 students | 86% reported that they had good digital skills, and 84% had issues with Internet access | 85% considered online learning as an advantage in terms of data availability | 51% felt communication with the teacher decreased, and 57% reported there were many distractions during online learning |
| ID | Author(s), Year | Country | Discipline | Sample Size | Student engagement dimensions |
|----|----------------|---------|------------|-------------|-------------------------------|
| 21 | Silva et al. (2021) | Brazil | Medicine | 266 students | Behavioural engagement: 47.5% shared Internet access among four or more people at home |
| | | | | | Cognitive engagement: Students and teachers needed training on how to use virtual platforms |
| | | | | | Affective engagement: Students had positive views about online learning but reported that universities needed strategies for helping students without Internet access |
| 22 | Zapata-Garibay et al. (2021) | Mexico | All disciplines | 660 students 38 universities | Behavioural engagement: 82.7% used digital tools for communication, 73.6% for academic work |
| | | | | | Cognitive engagement: 63.5% mentioned that they are familiar with online learning |
| | | | | | Affective engagement: Students felt that the online study time was demanding, and they had difficulties in following teachers’ instructions |
| 23 | Zúñiga Rodríguez et al. (2021) | Mexico | International commerce and customs | 4 student case studies | Behavioural engagement: Students reported unstable Internet access, which caused them to miss some sessions |
| | | | | | Cognitive engagement: Students considered the beginning of the transition to be complicated, but they later adapted |
| | | | | | Affective engagement: Most students positively viewed online learning, although some students reported that it produced mental issues and affected visual health |
articles were sourced from well-known databases that contain peer-reviewed articles. Moreover, the results were obtained after continuous and repeated revisions through discussion, doubt resolution and consensus building after considering all the feedback (Boesch et al., 2013).

RESULTS AND DISCUSSION

The 23 reviewed articles were based on nine Latin American countries, according to the following distribution: Brazil (4), Chile (3), Colombia (2), Costa Rica (1), Cuba (1), Dominican Republic (1), Ecuador (2), Mexico (6), Peru (2) and Brazil/Colombia/Peru (1) (see Table 3 and Figure 2). Moreover, in most of the studies, the participants were undergraduates. Only three studies included graduate students (Bazán-Ramírez et al., 2020; Cárdenas Zea et al., 2021; De la Fuente et al., 2021). Furthermore, six of the studies were based on health sciences, five on science and engineering, five on education, four on other disciplines: accounting and administration (2), international commerce and customs (1), letters (humanities) (1), and three on all of the academic disciplines.

Student behavioural engagement

RQ1a: What are the main characteristics of student behavioural engagement in online learning in Latin American higher education during the COVID-19 pandemic?

We found numerous characteristics of student behavioural engagement during the COVID-19 pandemic and organized them into the following four themes: soft skills development, pedagogical aspects, digital skills development and technology issues (see Table 4 and Figure 3).

| Country                    | Discipline | Health sciences | Science and engineering | Education | Other disciplines | All disciplines | Total |
|----------------------------|------------|-----------------|-------------------------|-----------|-------------------|----------------|-------|
| Brazil                     |            | 4               |                         |           |                   | 4              |       |
| Chile                      |            | 1               | 1                       | 1         |                   | 3              |       |
| Colombia                   |            | 1               | 1                       |           |                   | 2              |       |
| Costa Rica                 |            | 1               |                         |           |                   | 1              |       |
| Cuba                       |            | 1               |                         |           |                   | 1              |       |
| Dominican Republic         |            | 1               |                         |           |                   | 1              |       |
| Ecuador                    |            | 2               |                         |           |                   | 2              |       |
| Mexico                     |            | 2               | 2                       | 2         |                   | 6              |       |
| Peru                       |            | 1               | 1                       |           |                   | 2              |       |
| Brazil, Colombia and Peru  |            | 1               |                         |           |                   | 1              |       |
| Total                      |            | 6               | 5                       | 5         | 4                 | 3              | 23    |
FIGURE 2  Distribution of the studies by country and discipline

TABLE 4  Student behavioural engagement themes and characteristics

| Behavioural engagement themes         | Characteristics          | Study ID          | No. of studies | Total |
|--------------------------------------|--------------------------|-------------------|----------------|-------|
| Soft skills development              | Collaboration            | [3], [16]         | 2              | 7     |
|                                       | Communication            | [9], [14], [22]   | 3              |       |
|                                       | Interaction              | [1]               | 1              |       |
|                                       | Teamwork                 | [15]              | 1              |       |
| Pedagogical aspects                  | Dropping out             | [5], [6]          | 2              | 6     |
|                                       | Slow adaptation          | [10]              | 1              |       |
|                                       | Completed activities     | [13], [18]        | 2              |       |
|                                       | Active learning          | [7]               | 1              |       |
| Digital skills development           | Social media             | [11]              | 1              | 4     |
|                                       | Difficulties             | [2], [12], [8]    | 3              |       |
| Technological issues                 | Internet access          | [4], [17], [19], [20], [21], [23] | 6 | 6 |

FIGURE 3  Themes and characteristics of student behavioural engagement
Soft skills development

The development of soft skills is vital for higher education students, as it increases the employability of graduates. However, developing soft skills among students is slightly more challenging in online learning environments (Myers et al., 2014). Nevertheless, online students can develop such skills by increasing engagement and participation. In the reviewed studies, the development of such skills manifested in the following ways: (a) students actively collaborated in learning (Cárdenas Zea et al., 2021; Rodríguez Fernández et al., 2021); (b) students had a positive perception of online communication with classmates (Flores Ferro et al., 2021; Quispe-Prieto et al., 2021; Zapata-Garibay et al., 2021); (c) students showed high levels of online interaction through likes and shares (Alves et al., 2021) and (d) students exhibited improved teamwork skills (Realyvásquez-Vargas et al., 2020). All of these soft skills are essential for professional success.

Pedagogical aspects

In the reviewed studies, some pedagogical aspects, both positive and negative, were observed during online learning: (a) in some studies, the student drop-out rate was higher than that in face-to-face learning (De la Fuente et al., 2021; Delgado, 2021); (b) students slowly adapted to the new modality of online learning (Lovón Cueva & Cisneros Terrones, 2020); (c) a high percentage of tasks was completed in a timely fashion (Pérez-Villalobos et al., 2021; Sandi-Urena, 2020) and (d) active learning in virtual classrooms was similar to that in traditional face-to-face classrooms (Domínguez-Torres et al., 2021). Ferreira et al. (2018) found that online courses featured a high drop-out rate because the learning design and delivery approach did not consider the diverse characteristics of students. Regarding online courses, Dumford and Miller (2018) also mentioned that students reported less exposure to effective teaching, which suggests that online learning might somewhat benefit or be deterrent for engagement.

Digital skills development

Digital skills can help students advance in future careers, not only bridging any digital gaps but also positively affecting their social life (Martinovic et al., 2019). For example, one study found that students using social media exhibited excellent learning performance (Mendoza-Lizcano et al., 2020). However, in other studies, students reported having some difficulties in online learning activities (Bazán-Ramírez et al., 2020), which they needed a considerable amount of training to ensure that their performance was not affected (Faria et al., 2021), indicating that online learning requires more work (Molina Gutiérrez et al., 2021).

Technological issues

Internet access is inseparable from online learning. The provision of broad, fast, effective and efficient Internet coverage affects the quality of online learning (Laksana, 2021). Moreover, Internet access is a necessary good for modern social living, being part of the United Nations’ sustainable development goals (United Nations, 2015). The reviewed studies highlighted students’ difficulties in accessing the Internet at home, which resulted in students missing some online sessions because of inadequate Internet services (Chávez-Miyauchi et al., 2021; Romero Alonso et al., 2021; Santos et al., 2021; Sapien Aguilar et al., 2020; Silva et al., 2021; Zúñiga Rodríguez & Cáceres Mesa, 2021).
Student cognitive engagement

RQ1b: What are the main characteristics of student cognitive engagement in online learning in Latin American higher education during the COVID-19 pandemic?

The reviewed studies highlighted some characteristics of student cognitive engagement during the COVID-19 pandemic, which we organize into the following four themes: academic performance, motivation to learn, self-regulated learning and self-perceived digital literacy (see Table 5 and Figure 4).

Academic performance

Academic performance is the extent to which a student has achieved educational goals. Usually, the longer students engage in learning activities, the better their academic performance (Bravo-Agapito et al., 2021; Yokoyama, 2019). Some factors might predict students’ academic performance in an online environment, such as students’ access to learning content; the number of visits and attempts in online questionnaires; variables related to online consultation and online tasks; students’ age, where academic performance is inversely proportional to age; and the degree of students’ interactions within online platforms. In the

| Cognitive engagement themes            | Characteristics | Study ID           | No. of studies | Total |
|----------------------------------------|-----------------|--------------------|----------------|-------|
| Academic performance                   | Performance     | [1], [4], [5], [6], [15], [18] | 6              | 6     |
| Motivation to learn                    | Motivation      | [2], [13], [9], [14] | 4              | 4     |
| Self-regulated learning                | Positive self-regulation | [7], [8], [16] | 3              | 5     |
|                                        | Difficulties    | [10], [12]        | 2              |       |
| Self-perceived digital literacy        | Positive self-perception | [3], [11], [17], [20], [22], [23] | 6              | 8     |
|                                        | Difficulties    | [19], [21]        | 2              |       |

FIGURE 4  Themes and characteristics of student cognitive engagement
reviewed studies, the students reported that their academic performance improved when they used the online platforms (Alves et al., 2021; De la Fuente et al., 2021; Delgado, 2021; Realyvásquez-Vargas et al., 2020; Sandi-Urena, 2020).

Motivation to learn

Motivation to learn is the driving force that moves and engages students in learning. Students' motivation to learn or reasons to engage in learning activities are important in the online learning space. For example, students with greater motivation will more frequently engage in online learning activities or spend longer time watching video activities or working with online tutorials. Gustiani (2020) highlighted that intrinsic motivation, such as zest to acquire new knowledge, was an important factor for online learning. In the reviewed studies, Latin American higher education students showed motivation to learn (Bazán-Ramírez et al., 2020; Quispe-Prieto et al., 2021), and they reported that online courses were motivating (Flores Ferro et al., 2021; Pérez-Villalobos et al., 2021).

Self-regulated learning

Self-regulated learning is a process in which students take initiative to learn, formulate goals and select suitable learning strategies. Self-regulated learning has become more important in online learning environments, as distance learning requires students' agency and ownership of their learning (Çebi & Güyer, 2020). The reviewed studies revealed that the levels of self-regulated learning in online environments were higher than (Faria et al., 2021; Rodríguez Fernández et al., 2021) or similar to that of face-to-face classes (Domínguez-Torres et al., 2021). However, some students reported difficulties in self-regulated learning (Molina Gutiérrez et al., 2021).

Self-perceived digital literacy

Digital literacy is the knowledge and skills for locating, organizing, evaluating and creating information using digital technologies. Santos and Serpa (2017) mentioned the importance of promoting digital literacy in HEIs to develop students' digital strategies and make them proficient in learning through technology. In the reviewed studies, some students were perceived to have high levels of digital literacy and knowledge on digital tool usage (Cárdenas Zea et al., 2021; Mendoza-Lizcano et al., 2020; Romero Alonso et al., 2021; Zapata-Garibay et al., 2021; Zúñiga Rodríguez & Cáceres Mesa, 2021), whereas some experienced difficulties in using online platforms (Santos et al., 2021) and even requested training on their usage (Silva et al., 2021).

Student affective engagement

RQ1c: What are the main characteristics of student affective engagement in online learning in Latin American higher education during the COVID-19 pandemic?

The reviewed studies highlighted four main characteristics of student affective engagement: value of online learning, positive attitude toward online learning, satisfaction with online learning, and stress and anxiety. It should be mentioned that one of the reviewed studies (Domínguez-Torres et al., 2021) did not report students' emotional response to online learning (see Table 6 and Figure 5).
Value of online learning

Students' value of online learning refers to the benefits offered by virtual environments, irrespective of any initial difficulties or challenges. Thus, the perceived value of online learning is assessed relative to other delivery modalities, such as face-to-face classes. Perceived value has been a focus in the research on online learning adoption. Yuzhaninova and Moroz (2018) noted that students value online learning for its flexibility, access to diverse digital resources, and the opportunity to study remotely saving commuting time and reducing expenses. Students who participated in the reviewed studies highly valued the learned information (Alves et al., 2021), online benefits (Bazán-Ramírez et al., 2020), and opportunities for collaborative learning (Rodríguez Fernández et al., 2021).

Positive attitude toward online learning

Students' attitude toward online learning refers to their disposition toward online courses and technology usage for learning. Previous studies have reported that students mostly have positive attitudes toward online learning. Nowadays, higher education students use technology in everyday life, and they desire effective online learning environments and online support during learning activities (Peytcheva-Forsyth et al., 2018). Most of the reviewed articles reported positive attitudes of students toward online learning (Cárdenas Zea et al., 2021; De la Fuente et al., 2021; Silva et al., 2021), video resources (Delgado, 2021), technology usage (Romero Alonso et al., 2021) and online courses (Faria et al., 2021; Chávez-Miyauchi et al., 2021; Flores Ferro et al., 2021).
Satisfaction with online learning

Students' satisfaction with online learning refers to their evaluation of how well online courses are delivered. It is the degree to which the online course delivery is consistent with students' expectations, which are more emotional in nature, as the students feel satisfied. Landrum et al. (2020) mentioned that students' satisfaction is positively related to the course design or clarity and teacher–student interaction. In their study, students with more online experience found online courses and environments more enjoyable. The students in the reviewed articles were satisfied with the online design (Molina Gutiérrez et al., 2021), online platform usage (Pérez-Villalobos et al., 2021) and virtual classrooms (Quispe-Prieto et al., 2021; Realyvásquez-Vargas et al., 2020; Sandi-Urena, 2020).

Stress and anxiety

Stress and anxiety affect the quality of life and negatively affect the mental health and well-being of students, which can result in various negative outcomes for university students. Stress and anxiety have been associated with lower emotional engagement. Mheidly et al. (2020) recommended some strategies to cope with stress and anxiety during online learning, such as implementing healthy practices in between online sessions (eg, breathing exercises), promoting awareness of the physical and emotional consequences of extended online time, and allowing learners to share their feelings and mental struggles and providing support. In several of the reviewed studies, some students were emotionally affected by stress and anxiety (Lovón Cueva & Cisneros Terrones, 2020; Mendoza-Lizcano et al., 2020), which was a negative aspect of online learning during the long physical isolation period (Santos et al., 2021; Zúñiga Rodríguez & Cáceres Mesa, 2021).

Implications

RQ2: What are the main implications for online learning in Latin American higher education?

The implications of our findings for online learning in Latin American higher education are as follows:

To transform higher education

The COVID-19 pandemic has enforced a compulsory change in delivery modalities in higher education, from traditional face-to-face instruction to online education. Despite the challenges involved in the transformation of educational systems, the transformation is necessary for the progress of education not only in Latin America but also in the whole world in the present 21st century (Hannache-Heurteloup & Moustaghfir, 2020).

To provide adequate professional training

Educators from HEIs should be offered in-service training and professional development on the application of emerging technologies and the combination of technological and pedagogical skills to conduct learning activities that promote students' behavioural, cognitive
and affective engagement. Nevertheless, this requires teachers' willingness to embrace online learning as part of their daily teaching activities and professional development (Williams, 2017).

**To improve Internet connectivity**

The limited access to stable Internet connection at home is a crucial problem in Latin America. In the reviewed studies, students struggled with slow Internet and even missed some lessons. This situation creates an access gap in the region, and it becomes a barrier to student engagement, resulting in frustration and disengagement. Thus, the decision makers in Latin America need to improve the network connectivity (Kiedanski & Grampín, 2017) to facilitate the delivery of learning activities to students in distant regions, making Internet services accessible to every citizen, as Internet access is part of the United Nations' sustainable development goals (United Nations, 2015).

**To ensure quality online learning in higher education**

To ensure quality online education, students learning in online environments need to gain appropriate learning experiences to develop the skills and competences required in their professional practice. This means HEIs need to design and plan flexible learning using appropriate pedagogical methods, provide access to digital resources, and evaluate learning outcomes (Huang et al., 2020), which can be facilitated by the use of new technological tools, such as learning analytics. However, quality online education requires the commitment and collaboration of all stakeholders: educational authorities, administrative staff and faculty members.

**To provide emotional support**

In the reviewed studies, the stress and isolation due to the pandemic situation were other issues affecting online learning. Students and teachers reported that the COVID-19 pandemic itself was a source of stress that affected their performance and created emotional exhaustion. Therefore, HEIs are expected to offer emotional support services, and help students and teachers develop coping strategies (Copeland et al., 2021).

**Tripartite dimensions of student engagement**

Overall, the findings of our study suggest that the tripartite dimensions of student engagement—behavioural, cognitive and affective—merit scholarly attention in higher education online learning.

Our findings on behavioural engagement are supported by Knopf et al. (2021) who also reported that behavioral engagement is characterized by students’ interaction with classmates, teamwork, collaborative and soft skills. Moreover, Bali and Liu (2018) argued that online soft skills are likely to be improved in inclusive and supportive online learning environments. In contrast, the lack of efficient Internet access that causes the discontinuation of online classes can lower student engagement (Bali & Liu, 2018; Regalado-Pezua & Galeano, 2022). This underscores the necessity of providing students with quality Internet access in higher education.
In terms of cognitive engagement, our findings indicate that it is crucially important to take into account motivation, positive self-perception of digital literacy, and self-regulation: Pellás (2014) also reported that these characteristics play a pivotal role in the success of online learning. Highly motivated learners tend to demonstrate a high level of cognitive engagement in online learning (Bináli et al., 2021). Educators, therefore, play an important role in fostering student engagement in online learning.

Regarding affective engagement, attention needs to be paid to student perceptions of and attitudes toward online learning. Positive attitude and previous experience with online learning platforms are found to be a strong indicator for student satisfaction and affective engagement (Ferrer et al., 2022; Kovačević et al., 2021). However, the isolation imposed by the pandemic caused stress and anxiety among students. Therefore, it is important to provide emotional support through, for example, stress-relieving activities and mental health care to enhance student affective engagement. It is worth noting that teachers' affective engagement skills influence not only students' emotional engagement but also the quality of online learning (Kordrostami & Seitz, 2021).

In summary, the COVID-19 pandemic has triggered a sudden and unprecedented digital transformation of education that has brought both challenges and opportunities. In Latin America, before the outbreak of the pandemic, some of the online platforms in HEIs were underused, functioning mainly as document repositories (Guillén-Gámez & Mayorga-Fernández, 2020) However, today HEIs have implemented online courses to continue the teaching and learning activities, and students' responses to this transition have been diverse. We analyzed student engagement in online learning on three dimensions—behavioural, cognitive and affective—and determined the characteristics of each type of student engagement. As Dillenbourg (2016) highlighted, technology does not guarantee learning; to effectively support the transition to online learning, learning activities must be appropriately designed and introduced to engage learners behaviorally, cognitively, and affectively.

Limitations and future directions

While we have tried to provide a systematic review of relevant studies, we recognize some limitations. First, this study does not intend to generalize its findings, but to contribute with the understanding of student engagement in online learning in Latin American HEIs and provide some insights to improve the quality of online learning. As Briggs et al. (2018) pointed out, “the need exists … to support and promote more region-focused research”, particularly on the coverage and accessibility of information regarding Latin America. Second, we cannot guarantee that our review included an exhaustive list of relevant research; nonetheless, we have been able to identify major and important characteristics of student engagement in online learning that are valuable for future studies. Third, the study was framed on three dimensions of student engagement—behavioural, cognitive, and affective. Other scholars could use different frameworks or add other dimensions. Finally, the study primarily focused on student engagement while briefly mentioning teacher engagement strategies; thus, future studies could investigate teacher engagement in higher education.

CONCLUSIONS

The COVID-19 pandemic required Latin American HEIs to adapt to online instruction where students undertook technology-based online learning. Our review has identified the importance of student engagement in online learning and the major characteristics of the tripartite dimensions of engagement—behavioural, cognitive and affective. Furthermore, the
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implications of the findings for online learning in Latin American higher education are the need for (a) transformation of higher education, (b) adequate professional training, (c) access to Internet connectivity, (d) quality online learning in higher education and (e) student well-being. The conceptualization of the tripartite dimensions of student engagement sheds light on the teaching and learning processes and the key characteristics of student engagement in online learning and can thus serve as a basis to improve the quality of online learning in Latin American higher education.

CONFLICT OF INTEREST
The authors declare that they have no competing interests.

ETHICS STATEMENT
Ethics approval was not required for this systematic review.

DATA AVAILABILITY STATEMENT
Requests for the data can be addressed to the corresponding author.

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