



Return to University Classrooms With Blended Learning: A Possible Post-pandemic COVID-19 Scenario

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After more than 2 years of the pandemic caused by COVID-19, a gradual return to face-to-face teaching has been taking place. Therefore, administrators need to establish procedures to facilitate and ensure the quality of teaching during this process. The purpose of this article is to describe the strengths and challenges of implementing Blended Learning (BL). The design used is consistent with a secondary investigation of a narrative review. As a result, several recommendations are presented for building institutional frameworks that enable the implementation of high-quality BL models in the context of a gradual return to face-to-face courses in higher education. From a theoretical and contextual perspective, considerations for transitioning to this model are discussed, based on lessons learned from emergency remote education. We conclude that the present post-pandemic scenario constitutes a pivotal moment for determining the way education is delivered in higher education.

Keywords: Blended Learning, higher education, education quality, lecturing learning, COVID-19

INTRODUCTION

The COVID-19 pandemic has changed the entire context of human life. On 11 March 2020, the World Health Organization declared a global pandemic with more than 90,000 infected people in more than 60 countries (ONU, 2021). Due to this scenario, in a global attempt to contain the spread of the virus, UNESCO (2021) announced the temporary closure of educational institutions worldwide, affecting more than 91% of students (UNESCO, 2021). Higher education had to rethink academic plans as authorities, faculty, students, and workers in general could not be on university campuses. Therefore, the university education system had to be rapidly transformed to assure the continuity of the education process. During this time, emergency remote education was adopted by most institutions as the best plausible option.

Emergency remote education is a mode of instruction in which instructors adapt the content, tools, and the traditional teaching and learning processes to online education (Bustamante, 2020). In addition, it has recently been defined as an alternative form of instruction developed with the goal of quickly and reliably continue the teaching and learning processes during an emergency or crisis (Hodges et al., 2020). This has led to the transformation of traditional learning environments into online learning scenarios, requiring teachers and students to acquire digital skills and competencies, implying the continuous implementation of educational innovations.

OPEN ACCESS

Edited by:

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Port Said University, Egypt

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Specialty section:

This article was submitted to
Teacher Education,
a section of the journal
Frontiers in Education

Received: 30 May 2022

Accepted: 22 June 2022

Published: 19 July 2022

Citation:

Cobo-Rendón R, Bruna Jofre C,
Lobos K, Cisternas San Martín N and
Guzmán E (2022) Return to University
Classrooms With Blended Learning:
A Possible Post-pandemic COVID-19
Scenario. *Front. Educ.* 7:957175.
doi: 10.3389/educ.2022.957175

In this context, teachers faced the major challenge of adapting their course plan and design in a virtual format in a short period of time, in some cases with little institutional resources and/or pedagogical capabilities (Bozkurt and Sharma, 2020). This implied that the teaching staff had to adapt their learning resources and activities, as well as their assessment processes, to a new teaching scenario. However, due to the pressing need in which the virtualization process was carried out, lack of careful planning and implementation of the adaptation process has been reported. As a result, teachers did not take full advantage of the online format (Bozkurt and Sharma, 2020; Hodges et al., 2020; García-Morales et al., 2021). Therefore, teachers still need to receive technological and pedagogical support from their institutions to achieve an appropriate integration of technology in the classroom to progress from emergency remote teaching to quality online education.

At present, it is difficult to predict how the post-pandemic education will take place in the medium-term. However, it is expected that online education will be a component of teaching and learning process. The experience during the pandemic has provided progress in the implementation of virtual education, highlighting the importance of creating flexible and versatile learning environments. Therefore, future learning environments should combine traditional face-to-face teaching with technological tools and online learning (Gómez, 2020; Kuklinski and Cobo, 2020), with the appropriate institutional support to ensure a high-quality process. Blended Learning (BL) emerges as an appropriate model to address this challenge. Hybrid or blended forms may help improve the quality of face-to-face teaching by moving content delivery online and focusing in-person sessions on active learning (Murphy, 2020). BL represents a remarkable opportunity to incorporate new resources, strategies, and learning spaces into the teaching and learning process, enabling a transformation in higher education. On the other hand, United Nations Organization includes quality education among the 17 Sustainable Development Goals (ONU, 2015). Quality education is a key element for the sustainable development of the countries, necessary for the growth of today's society (Daniela et al., 2018). In this context, universities can contribute positively to the sustainable development of societies. The role of higher education institutions goes beyond increasing the number of students. Thus, universities should focus on the development of quality education guided by three missions: teaching and learning, scientific research, and service to the community (Owens, 2017).

The conceptualization of BL, its strengths, and challenges. The construction of an institutional framework for the implementation of BL from a theoretical and contextual perspective is discussed. This construction provides key elements to consider for the implementation of a high-quality BL model in the context of a gradual return to face-to-face instruction after the pandemic.

The aim of the present study is to describe, through a secondary narrative review research (Salinas, 2020). Narrative reviews correspond to research that aims to describe and discuss

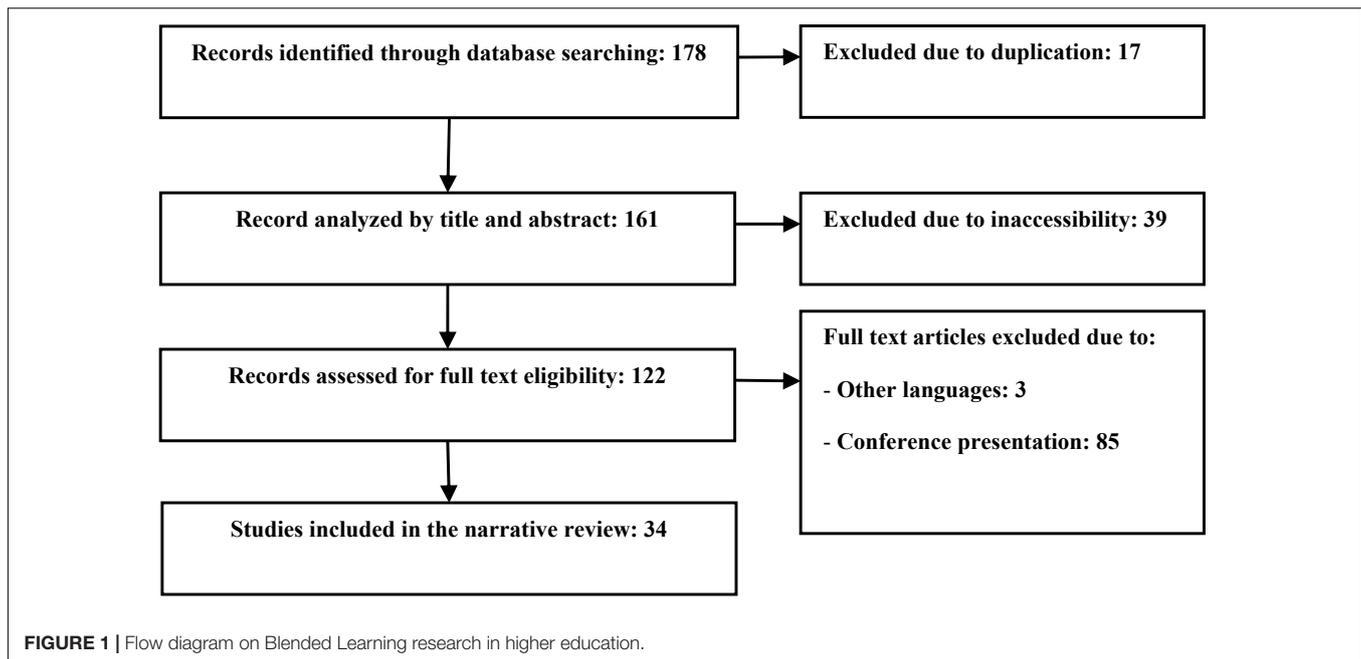
the development of a particular topic, from a theoretical or contextual point of view (Byrne, 2016). The research question that based this study was What are the benefits and obstacles of implementing blended learning in Higher Education in the post-pandemic scenario? The search for scientific articles was conducted from the Web of Science database. The descriptors "blended learning" (Title) and "Higher Education" (Title) were used in a first search, resulting in a total of 171 documents. Subsequently, a new iteration was performed considering descriptors associated with the pandemic, the search being as follows: "Blended Learning" (Title) and "Higher Education" (Title), and "COVID-19" OR "coronavirus" OR "2019-ncov" OR "sars-cov-2" OR "cov-19" (All Fields), this resulted in 7 documents, generating a total of 178 records (see **Figure 1**). The search covered until December 2021. The titles and abstracts of all articles identified in the electronic search were reviewed, producing the list of selected articles of interest to be included in the study according to the objectives for the article construction.

PROBLEMATIZATION OF BLENDED LEARNING

The use of the term BL is relatively new in the literature (Hrastinski, 2019). BL is defined as a mode of instruction that combines face-to-face and online instruction to intentionally use strategies, technologies, and pedagogical activities that incorporate these two modalities (face-to-face and online) for the benefit of students (Bartolomé Pina, 2004; Hrastinski, 2019). Thus, this approach attempts to combine the benefits of face-to-face instruction and virtual learning (Broadbent, 2017). In addition, BL is considered an effective mode of instruction because it allows flexible, timely, and continuous learning (Brown, 2016).

The concept of BL is quite broad. Therefore, there are different definitions available to specify how virtual and face-to-face components are integrated (Driscoll, 2002; Hrastinski, 2019). According to Garrison and Kanuka (2004), "blended learning is the thoughtful integration of classroom face-to-face learning experiences with online learning experiences." On the other hand, Watson and Murin (2014) offer an enriched version of the definition of BL as a formal education program in which a student learns at least in part through online learning, with some element of student control over time, place, path, and/or pace; at least in part in a supervised brick-and-mortar location away from home; and the modalities along each student's learning path within a course or subject are connected to provide an integrated learning experience (Watson and Murin, 2014). A more recent definition describes BL as a model that combines multiple delivery media that are designed to complement each other and promote learning and application-learned behavior (Bruggeman et al., 2021).

When designing a course in the BL modality it should be kept in mind that online work should be as enriching as face-to-face classroom work. On the one hand, asynchronous work provides



students with the opportunity to learn independently. On the other hand, face-to-face environments encourages interaction, reflection, the development of critical thinking, provide settings for collaborative work and promotes an active attitude toward the learning process (Allan et al., 2019). Furthermore, by incorporating technological resources into the learning and teaching process, BL promotes development and innovation in both virtual and online classrooms.

Oliver and Trigwell (2005) criticized the concept BL not only for the broad nature of many previous definitions of the concept, but also because by focusing on the mode of delivery, teachers concentrated more on the teaching process than the learning process. While this criticism may not be entirely fair, it highlights the danger of integrating technology without considering how it contributes to the learning process (Oliver and Trigwell, 2005). Therefore, it is important to keep in mind that BL is not only a framework for the instructional design of a course, but also refers to the appropriate and effective use of technology to enhance teaching and learning processes (Allan et al., 2019).

In summary, we propose a definition of BL as a bimodal teaching method (face-to-face and online) in which face-to-face classes are carefully designed to use appropriate teaching strategies to facilitate the teaching and learning process. The course design should include at least 30% of the program delivered online, considering high-quality and well-organized content. In addition, a BL program seeks to integrate technologies, strategies, and pedagogical activities holistically, intentionally, and effectively, considering constituent elements such as online interactive collaboration, student control elements, linking modalities across the learning pathway. Therefore, BL cannot be considered a fixed model. Its design will vary according to institutional orientation, the didactics of the subject and the needs of the students. All these factors must be integrated into an institutional plan that is fully balanced.

STRENGTHS AND CHALLENGES FOR THE IMPLEMENTATION OF BLENDED LEARNING IN HIGHER EDUCATION

From an institutional perspective, BL is seen as an improvement in higher education since it combines the advantages of face-to-face and online teaching (Bokolo, 2021). Moreover, there is empirical evidence that a BL modality can improve student learning outcomes (Bernard et al., 2014; Vo et al., 2017). In this sense, the unique elements of BL could help to enhance students' professional and social skills.

In BL, the learning experience is improved by redesigning instruction to include new learning opportunities that are added to the face-to-face experience. Therefore, a well-designed BL program enhances student-teacher interaction during face-to-face sessions while efficiently using online time to interact with educational resources (Means et al., 2013). Interactivity includes instructor-to-student interaction, student-to-student interactions, and student-to-technology interaction (automatically graded quizzes with predefined feedback) (Singh and Thurman, 2019). One of the strengths of BL is that, if carefully designed, it provides an opportunity for students to be autonomous and active learners. This encourages self-regulated behaviors such as planning and time management (Broadbent, 2017). Similarly, BL enables the development of reflection and critical thinking and promotes interaction and collaboration between students (Ustun and Tracey, 2021). In addition, studies have reported that the use of BL in higher education is perceived by students to be better when compared to face-to-face or online-only learning (Ma and Lee, 2021).

It can be concluded that implementing BL cannot be achieved by simply by adding some digital tools or resources to the learning and teaching process. In this sense, the implementation of BL requires delivering specific institutional frameworks

that guarantee the quality of the process, which needs to be outlined in accordance with institutional planning and policy (Adel and Dayan, 2021). Therefore, representing an important challenge for both teachers and higher education administrators. Consistently, a systematic review addressing the implementation of BL identified four challenges that arise in designing courses under this modality: (1) flexibility (providing an autonomous and versatile environment for students), (2) stimulating faculty-student interaction in both face-to-face and online modalities, (3) facilitating student learning by promoting self-regulation, and (4) fostering an affective learning climate that promotes positive emotions and attitudes toward the course and learning experience (Boelens et al., 2017).

From an institutional and economic perspective, the implementation of BL faces several challenges. Another systematic review found that (1) providing technology and adequate support and services to the educational community is difficult to achieve. In addition, it is important to also consider the cost of producing digital content and learning platforms. (2) Teacher training should focus on the effective use of technology, use of online materials, and effective approaches to autonomous use of technology, which is a challenge in itself (Rasheed et al., 2020). Another aspect to be considered in the proper implementation of BL concerns the spaces (physical and virtual) in which the teaching and learning processes take place. Also, a well-designed BL course will enhance students' learning experience and retention (Milheim, 2012; Poll et al., 2014). On the other hand, the need to create well-structured learning environments that clearly inform what is expected of students has been reported. Expectations should be aligned with the opportunities offered by the learning environments in order to exploit all their features and potentials.

Virtual learning environments are web-based systems that allow students to interact with teachers and peers, access learning resources at any time and place, and use information and communication technologies (Hamutoglu et al., 2020). According to Rapposelli (2014), the design of a virtual learning environment affects online participation, which in turn affects students' academic achievement (Rapposelli, 2014). Therefore, when designing a virtual learning environment, the number of offered elements is important. An excess of learning resources and activities could lead to cognitive overload, which hinders learning and reduces motivation (Hamutoglu et al., 2020). Thus, the recommendation is to create virtual learning environments that are as simple as possible and contain as few options and elements as possible. It is also important to ensure that there is a clear learning path in the virtual learning environment.

This allows students to follow a sequential and orderly learning process. In this sense, it might be beneficial to follow the suggestion of the PACIE methodology (Basantes et al., 2018). PACIE proposes to divide a course into three blocks: the starting block to present the relevant information of the course, academic blocks for displaying the content, and a final block to complete the educational process and give a formal closure to the course (Basantes et al., 2017). Moreover, virtual learning environments need to be enriched with resources that support students' learning processes. Among the most valued resources by students at the university level are lectures narrated

in PowerPoint, video summaries with key concepts, and videos from platforms available on the Internet (Reed and Watmough, 2015; Hamutoglu et al., 2020). Finally, the features most requested by students include improving feedback and providing up-to-date information about changes made in the virtual learning environment (Reed and Watmough, 2015).

In context with the above, coherence must also be maintained regarding the physical space for face-to-face learning, since the way the face-to-face classroom is organized also affects how learning processes are developed and generated (Donkin and Kynn, 2021). One way in which the classroom can be organized is setting up a physical space for educational activities that have certain architectural and design features to promote active learning (Talbert and Mor-Avi, 2018). Such classroom configurations have been shown to lead to improve students' performance (Oliver-Hoyo et al., 2004; Beichner et al., 2007; Brooks and Solheim, 2014). In this sense, connectivity is identified as a crucial aspect to achieve a greater impact on students' learning. It has been reported that any architectural design, furniture, or resource that increases connectivity in any way, strengthens the impact of the active learning space (Talbert and Mor-Avi, 2018). An example is the use of adaptable furniture and chairs that allows 360° movement. This has a positive effect on collaboration between students and quickly changes the organization of the classroom (Henshaw et al., 2011). On the other hand, a polycentric organization of the classroom does not draw students' attention to the front part of the room occupied by an authority figure, but improves group cohesion and enables active learning (Soneral and Wyse, 2017). It is essential to take into account the composition of online and face-to-face learning when implementing BL since it is not only based on the simple integration of face-to-face teaching with digital media, but it involves responding to diverse learning needs according to the training requirements. This highlights BL because it supports learning patterns and learning materials that are diverse in a flexible way to assist students in their learning (Tambunan et al., 2021).

Additionally, in order to avoid academic overload and implement a successful BL program, it is also important to find a balance between face-to-face and online time. According to Allen and Seaman (2010), it is recommended that the percentage of content taught online should range from 30 to 70%. Thirty percent of online time is sufficient to eliminate the use of the internet only for downloading references and submitting assignments, while 70% is the difference between BL and a 100% online course (Allen and Seaman, 2010). Similarly, these authors emphasize that there is little understanding today of the key challenges institutions face in implementing BL programs, since research in past years has mainly focused on students and faculty, rather than institutions (Rasheed et al., 2020). Therefore, to achieve excellence in the implementation of BL, it is essential to make institutional adjustments that are led by higher education administrators. These adjustments should consider key elements such as pedagogical aptitude and faculty affinity for technology, as well as motivating faculty to adopt this modality (Antwi-Boampong, 2020). University authorities should have a deep understanding of these elements, as successful implementation of BL programs requires a comprehensive model that provides

a detailed framework and clear steps for faculty and students to facilitate the incorporation of the model (Adel and Dayan, 2021). Thus, institutions interested in implementing BL must propose an institutional perspective that serves as a guide for planning, developing, enhancing, implementing, and managing programs for their teaching staff that enables the transition to this new scenario (Bokolo, 2021).

Some studies have provided certain guidelines and directions for institutional implementation of BL. For example, Graham et al. (2013) proposes a general design that considers three stages: Awareness/Exploration, Adoption/Early Implementation, and Mature Implementation/Growth (Graham et al., 2013). Similarly, the work of Adekola et al. (2017) adds that higher education authorities need to consider the following elements when implementing BL: (1) physical infrastructure through the presence of flexible learning and virtual spaces such as virtual learning environments or digital libraries, (2) technological support for teachers through different levels of digital literacy, (3) development of pedagogical vision through the transition of old programs to new teaching and learning models, (4) university management and organizational activities, (5) the promotion of an institutional culture and ethical/legal elements such as accessibility and access equity, copyright compliance and intellectual property management (Adekola et al., 2017). More recently, and associated with emergency remote education, five principles have been proposed for the incorporation of virtuality: simplicity, accessibility, affordability, flexibility, and empathy. Affordability and flexibility are the two principles worst evaluated by students and associated with less developed countries (Cahyadi et al., 2021).

In summary, following the experience of the COVID-19 pandemic, higher education administrators need to develop and apply a range of institutional interventions to deliver successful BL programs. The development and application of institutional frameworks for BL will enable the creation of an adapted and situated vision of the modality within each institutional context. Furthermore, these policies must be carefully designed and distributed to implement an appropriate teaching approach. This approach must be aligned with the technological and physical conditions of each institution, considering educational quality, socialization, and appropriation of these policies, assuring that criteria are consistent and that suitable curricular adjustments are made.

Due to the COVID-19 pandemic it has become clear that both teachers and university leaders need a high level of preparedness so that we can adapt quickly to changes in the environment, so it is important to study the technology in depth and with due diligence to balance the tensions generated in this crisis (Dhawan, 2020). In this regard, **Figure 2** presents a SWOC Analysis of blended learning a possible post-pandemic COVID-19 scenario that seeks to contribute to this aspect (see **Figure 2**).

Strengths

Blended Learning provides students with more learning opportunities, that are not supported by the traditional lectures. In face-to-face lessons students can interact directly with their teachers and peers, whereas online time is used for interacting with different resources and media that could allow them to

understand specific concept and improve their learning at their own pace (Brown, 2016).

In face-to-face lessons, teachers must invest their times in implementing active learning activities (Brown, 2016). This means that unidirectional and passive learning must be developed during the asynchronous component. This distribution of tasks and activities allow students to focus on applying concepts and content during face-to-face lessons that were previously studied asynchronously (Allan et al., 2019).

Weaknesses

Blended Learning requires the institution to implement a Learning Management System for virtual education. This implies to invest resources for acquiring the software and hiring employees for continuous technical support for both students and teachers. Moreover, institutions must invest time and money for training students and teachers in the use of the platform (Ashrafi et al., 2020; Dhawan, 2020).

The implementation of BL needs to consider an adaptation period for students and teachers to adopt this modality. On one hand, students need to learn how to manage their time, which requires to develop self-regulations skills. On the other hand, teachers need to learn how to use technology and how to implement active learning strategies. In both cases, people can get frustrated since they are expecting both students to be self-regulated, and teachers to be successful at implementing innovative educational strategies (Ożadowicz, 2020; Rasheed et al., 2020).

Opportunities

The implementation of BL promotes the adoption of innovative educational practices. On one hand, the online component of BL requires teachers to learn how to use new technology to guide and help students in their learning. On the other hand, the face-to-face component requires teachers to plan very efficient and student-center classes (Yang et al., 2022). BL implementation also gives the opportunity of thoroughly monitoring the learning and teaching process (Rapposelli, 2014). The advantages of a LMS allows teachers to use learning analytics to take student-center decisions that will improve their self-regulation skills, reduce dropout rates, and reduce failure (Zhang et al., 2020).

Challenges

Blended Learning implementation requires teachers to develop abilities that allows them to manage time, learning, and communication in an effective way. In traditional learning, teachers prepare and manage the curriculum considering only face-to-face lessons, whereas in BL the asynchronous component needs to be carefully designed, guiding learning during the autonomous working load otherwise left unattended. Additionally, it is expected that both face-to-face and online components are integrated in an efficient and effective way, so that students can accomplish their learning outcomes (Boelens et al., 2017; Adel and Dayan, 2021).

A successful implementation of BL requires students to have self-regulation skills since they need to perform autonomous work and organize their time to also attend face-to-face lessons. Thus, it is an important challenge for the institution to develop

STRENGTHS	WEAKNESSES
<ul style="list-style-type: none"> • BL provides students with more Learning opportunities, enriched in comparison to a traditional lecture. • BL promotes active learning during face-to-face lessons. 	<ul style="list-style-type: none"> • BL requires the adoption of a LMS and massive students and teachers training. • The implementation of BL needs to consider an adaptation period in which students and teachers adjust to this modality.
OPPORTUNITIES	CHALLENGES
<ul style="list-style-type: none"> • The adoption of BL promotes innovation in education, including new ways of monitoring students' progress. • It provides the opportunity of thoroughly monitor the learning and teaching process and provide feedback and make pedagogical decisions. 	<ul style="list-style-type: none"> • To properly combine face-to-face lessons with asynchronous work. • To develop programs that allows students to improve their self-regulation skills.

FIGURE 2 | SWOC Analysis of Blended Learning as possible post-pandemic COVID-19 scenario.

programs that allows students to improve their self-regulation skills (Broadbent, 2017).

SUGGESTIONS FOR THE IMPLEMENTATION OF BENDED LEARNING IN HIGHER EDUCATION POST COVID

Previous reports present BL as an appropriate educational model for the transition from emergency remote teaching, given that allows to benefit of what was learned during the pandemic (Megahed and Ghoneim, 2022). BL promotes the adoption of a constructivist model that contrasts with traditional face-to-face teaching. Therefore, the adoption of a BL model provides an opportunity to improve the quality of teaching and learning. Higher education institutions could guide the adoption of BL in the post-pandemic scenario. Based on the present report, some key elements are suggested:

1. Considering the broad definition of BL, an adequate use of terms to refer to specific components of e-learning or b-learning is crucial to the success in their implementation. In this context, an institutional definition should be provided, to define a common language and criteria for the implementation of an instructional BL model. To assure adaptation, the development of an institutional definition in collaboration with the educational community is suggested. Among the key elements of institutional guidelines, it is important to define the percentages of the online and face-to-face components. Moreover, clear institutional principles should accompany the process of implementation of a BL model, including the definition of the technological resources and platforms, such as LMS.
2. During the pandemic, institutions had to redesign, or at least to modify the curriculum so online classes could be implemented. In the same way, it is imperative to regulate the curricular aspects that must be considered for the implementation of a BL model. Particular attention must be paid to methodological and assessment aspects, and to

avoid academic overload considering both the online and face-to-face schedule, as well as the autonomous work.

3. With the implementation of virtual classes, every educational institution around the world was forced to acquire online-related infrastructure, including software and hardware. This is an important progress for the implementation of BL. As well, the face-to-face component requires specific physical spaces for active face-to-face learning and collaborative work. Thus, institutions should revise their infrastructure and plan to guarantee suitable on-campus spaces for students to perform autonomous online work, as well as collaborative spaces for face-to-face sessions.
4. The past 2 years, educational institutions made a great effort for training faculty, especially regarding the use of LMSs and virtual tools. However, there are still some topics in which teachers must be trained to successfully implement a BL-model, such as instructional design, new teaching methodologies, new assessment tools, tools for virtual teaching, and active learning strategies for face-to-face teaching. Moreover, it is necessary to train faculty in the integration of both, virtual and face-to-face methodologies, for a successful teaching and learning process. In this context, it is essential to generate and/or maintain learning communities to share best practices, identify difficulties, and jointly seek solutions considering the institutional identity of each university.
5. It is imperative to carry out continuous institutional assessment processes to identify needs and opportunities for improvement. The assessment process must be performed systematically for safeguarding the quality of the teaching and learning process. Therefore, the assessment should include all members of the community that the institution considers relevant for the process.
6. To cover students' needs must be a priority to implement a successful BL-model. In this context, educational resources and technologies must be ensured for all students so that they have a universal access to learning material and activities. Moreover, self-regulation abilities are necessary to manage time and to use platforms and tools properly, so training for students, especially regarding

psycho-educative variables, is also required to avoid failure in this learning format.

CONCLUSION

Blended Learning corresponds to an integration of elements of face-to-face teaching with elements of e-learning, as it uses, and can benefit of both modalities to deliver instructional processes, promoting professional and social competencies in students. The urgent virtualization of academic activities due to the COVID-19 pandemic represents an opportunity for the implementation of a BL model in higher education. Therefore, it is necessary to continue and improve the development of educational platforms and processes that will enable the implementation of quality educational strategies and resources. In addition, it is crucial to continue the unprecedented training of the higher education teaching staff displayed during the sanitary emergency, now including, carefully defined criteria and institutional definitions for teaching in the post-pandemic scenario, considering the requirements that the implementation of a BL model demands.

Blended Learning is an appropriate educational model for the post-pandemic transition that incorporates what was learned during the pandemic. The combination of face-to-face lectures with technology results in environments that can increase the learning potential of students (Megahed and Ghoneim, 2022). In this context, higher education institutions could guide the adoption of BL in the post-pandemic scenario globally.

It is also necessary to progress to a constructivist model that focuses on active learning. This implies the development of generic competences in disciplinary contexts, considered an essential and relevant aspect of higher education training. BL also contributes to the development of competences for the proper use of virtual environments and technologies, nowadays a requirement for professional performance.

Despite progress in immunization practices in many countries and improved health indicators, the ideal conditions for a full

face-to-face system are not yet in place. This work seeks to contribute to the review and reflection of institutional roles and recommendations for the implementation of a BL model as a proposal to implement a sustainable transformation of the university education system in a post-pandemic scenario.

DATA AVAILABILITY STATEMENT

The original contributions presented in this study are included in the article/supplementary material, further inquiries can be directed to the corresponding authors.

AUTHOR CONTRIBUTIONS

RC-R, CB, and NC: conceptualization. NC and KL: methodology. RC-R, NC, EG, and KL: investigation and writing—original draft preparation. CB: resources and writing—review and editing. EG: visualization. RC-R and KL: supervision. CB and KL: project administration and funding acquisition. All authors contributed to the article and approved the submitted version.

FUNDING

The research reported in this publication was supported by Unidad de Fortalecimiento Institucional of the Ministerio de Educación Chile, project InES 2018 UCO1808 research based educational innovation laboratory for strengthening basic science learning at the University of Concepción and FONDECYT Research Initiation Grant 2022 N°11221355, “Impact of a self-regulated learning web application integrated to the virtual classroom on self-regulated learning, engagement and educational outcomes of university students.”

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