Blended learning: a systematic review of advantages and disadvantages in students' perceptions and impacts on higher education institutes

Blended learning: uma revisão sistemática sobre vantagens e desvantagens na percepção dos alunos e impactos nas instituições de ensino superior

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ABSTRACT

The objective of this study was to identify how blended learning impacts the business model of higher education institutions and what advantages and disadvantages the students of higher education institutions perceive regarding the use of blended learning. To achieve this objective, a systematic review of the literature was carried out in five databases and, after all the requirements for its execution, the final sample for analysis was composed of 21 articles. It can be seen that the implementation of blended learning at higher education institutions changes the existing business model, however this impact is analyzed from the perspective of some specific elements (such as cost) and not through a holistic approach. With regard to the advantages perceived by the students of the HEI, the results pointed out the highlight in the flexibility of how and where to study and in the individualized learning provided. On the other hand, disadvantages include the need for responsibility and time management from students, in addition to the inevitability of a good quality internet connection. These aspects can be considered as a good driver of which aspects enhance blended learning from the students' perspective and which aspects need more attention on the part of those responsible for the implementation and execution of blended learning in higher education institutions, as students understand them as disadvantages.

Keywords: Blended learning; Higher education; Business model; Systematic literature review.

RESUMO

O objetivo deste trabalho foi identificar quais são os impactos verificados na perspectiva das instituições de ensino superior (IES) e dos estudantes com a adoção do *blended learning*. Para alcançar essa objetivo, realizou-se uma revisão sistemática da literatura em cinco bases de dados e, após todas as etapas necessárias para a sua execução, a amostra final para análise

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RESUMO

foi composta de 21 trabalhos. Como resultados nota-se que a implementação do *blended learning* nas IES altera o modelo de negócios existente, porém esse impacto é analisado sob a perspectiva de alguns elementos em específico (como o custo) e não por meio de uma abordagem holística. No que se refere às vantagens percebidas pelos alunos de IES, os resultados apontam o destaque na flexibilidade de como e onde estudar e na aprendizagem individualizada proporcionada. Por outro lado, destacam-se como desvantagens a necessidade da responsabilidade e gerenciamento do tempo por parte dos alunos, além da inevitabilidade de uma conexão de internet de boa qualidade. Esses aspectos podem ser vistos como um bom direcionador de quais elementos potencializam o *blended learning* na perspectiva dos alunos e quais aspectos necessitam de maior atenção por parte dos responsáveis pela implementação e execução do *blended learning* nas IES por serem entendidas como desvantagens pelos alunos.
Palavras-chave: *Ensino híbrido*; Ensino Superior; Modelo de negócios; Revisão sistemática da literatura.

Introduction

Information and communication technologies (ICT) are one of the factors currently responsible for changes in society (SILVA; MACIEL, 2015), and given the great evidence of changes due to ICT, there is no reason to believe that the teaching- learning process (mainly in higher education) will not be equally affected (GARRISON; KANUKA, 2004). Torres et al. (2014) comment that technology has an important role breaking the barrier of distance in teaching and also disseminating information with greater speed.

In order to remain competitive, higher education institutions (HEIs) are constantly challenged to meet (current and future) students' demands for connectivity, in addition to demands for better experiences and learning results (GARRISON; KANUKA, 2004). To enhance teaching and learning, ICT must be inserted into the educational process (SILVA; MACIEL, 2015) and integrated into the school environment with appropriate methodologies (SCHIEHL; GASPARINI, 2017), since the classroom is no longer the only space in the learning process. When using new technologies, there is an expansion and diversification of learning opportunities (LEDESMA, 2011).

The number of online courses and the number of institutions offering this type of course is growing. According to the Ministry of Education (MEC) (INEP, 2018),

distance learning was responsible for 7% of undergraduate enrollments, and in 2017 that number rose to 17.6%, serving more than 1.7 million students. Also according to the MEC (INEP, 2018), the number of online graduation students increased from 15.4% in 2007 to 33.3% in 2017. In addition, some researchers believe that the most significant impact of online education will be one that combines traditional classroom instruction and online learning to create what is known as blended learning (HWANG; ARBAUGH, 2009).

Defining the concept of blended learning is not an easy task, first because the search for a single definition of the term continues to be discussed among researchers; and second, several authors define it differently, so that a consensus has not yet been reached (HAN; WANG; JIANG, 2019; LIMA, 2017; MEDINA, 2018). However, according to Torres et al. (2014) an important aspect of blended learning is the combination of different pedagogical practices used in face-to-face and online learning, with the aim of achieving better student performance.

Graham (2006, p. 5) defines blended learning as "the combination of instructions from two historically separate models of teaching and learning: traditional face-to-face and distributed learning systems". Similarly, Garrison and Kanuka (2004, p. 96) state that "in its simplest form, mixed learning is the thoughtful integration of classroom-based learning experiences with online learning experiences".

However, although this type of teaching is considerably used, there is a lack in the literature of theoretical considerations about this modality, as well as its implementation, ranging from models to be followed to its advantages and disadvantages (COSTA et al., 2012; SOUSA; SCHLÜNZEN JR., 2018). According to Urias and Azeredo (2017), blended learning, as an alternative to traditional teaching, can achieve better results in relation to students' motivation and learning. **Table 1** presents a view of the advantages and disadvantages (both on the part of students and teachers) present in the literature and exemplifies the variability of results obtained.

Table 1 Advantages and disadvantages of the adopting of blended learning in higher

Author (s)	Advantages	Disadvantages
Medina (2018)	Possibility to offer students additional and varied support materials that are available at any time and anywhere; and the possibility for students to benefit not only from technological resources, but also from pedagogical resources.	Difficulty in making students aware of the online materials that were available for learning and training students and teachers in the use of online materials.
Lai, Lam e Lim (2016)	Communication between teachers and students can be instantaneous, which allows for continuous learning outside the classroom; the discussions that take place after class consolidate knowledge and contribute to learning; possibility to discuss with students from other geographic regions; and students of different profiles are encouraged to participate in the discussions.	Need for technical support to students; difficulties in time management (both by students and teachers); and lack of student engagement in online media.
Leite, Monteiro e Lima (2013)	Relativization of time / space; approximation to individual learning needs or styles; greater diversity of means and materials available; greater organization of teaching work; and automation and / or management of pedagogical tasks.	Technical difficulties in creating courses and disciplines on virtual platforms; difficulties in using the chosen platform; difficulties in time management by students and teachers; and difficulties in the initial participation of students.

Costa et al. (2012)	Student contributions to discussion forums; ease of access to files made available on the platform; discipline organization; and interaction between tutors, monitors and students.	Need for good infrastructure in the educational institution; low quality of the available platforms in relation to the use of chats; and a tendency for students to participate late in activities.

Source: Prepared by the authors.

It is noted, therefore, that the justification for studying these aspects lies in the opportunity to contribute to the knowledge on the subject by collecting evidence in the existing literature on these aspects. Thus, the problem that this research aims to answer is: "What aspects characterize the impact of blended learning on higher education in HEIs and on their students?"

The systematic literature review (SLR) appears as an alternative because it is able to gather and evaluate evidence belonging to a certain topic (BIOLCHINI et al., 2005; SAMPAIO; MANCINI, 2007) and to interpret all relevant content from research on a topic, subject, area or phenomenon of interest (KITCHENHAM, 2004). The general objective of this study was to identify the aspects that characterize the impact of blended learning in higher education in HEI and its students considering two specific objectives: (1) Recognize, through SLR, the aspects that characterize the impact of blended learning in HEIs and (2) Recognize, through SLR, the aspects that characterize the impact of blended learning on students, separating them into advantageous and disadvantageous.

From this, it is important to understand and clarify certain concepts related to our research. In relation to the first stated objective, according to Sohrabi, Vanani and Iraj (2019), a business model describes a company (or even a business sector) with a holistic approach, in such a way as to specify the agents that interact with the company and how these interactions create value and translate it into products and services for customers. The first specific objective comes from the understanding that the insertion of ICT in the context of higher education changes aspects of a business model (SMITH et al., 2008; VIGNARE; GEITH; SCHIFFMAN, 2006), such as strategies, service provision, cost structure, revenue sources, among others.

The second specific objective stems from the lack of studies in the literature that discuss not only theoretical aspects of blended learning, but also practical aspects regarding its implementation that could increase the performance obtained from the use of this teaching modality (COSTA et al., 2012; SOUSA; SCHLÜNZEN JR., 2018). Thus, the idea is that, by gathering evidence about the advantages and disadvantages perceived by students, better decisions can be made about strategies and implementation of blended learning, thus increasing their chances of success in higher education.

In the midst of discussions raised by research over the past few years, there is no way to ignore the occurrence of the pandemic caused by the appearance of the SARS-CoV-2 virus (which causes the Covid-19 disease) and the strong impacts it has had on education in face-to-face modality. Due to this situation, this modality became unfeasible considering the risks of contagion among the population. According to the United Nations for Educational, Scientific and Cultural Organization, until March 25th schools in 165 countries were closed due to the pandemic, causing the face-to-face classes of 1.5 billion students to be interrupted and the routine of 63 million basic education teachers to be changed (IDOETA, 2020).

In this context, many educational institutions and educators also resorted to what they meant by online education. It can be assumed that the experience of emergency remote education in times of a pandemic will be able to provide incentives for hybrid education to expand in the near future. Thus, the indication of what impacts this teaching modality has on the business model of the HEIs, as well as the positive and negative points perceived by the students, can assist in the development and application of hybrid education.

SLR was the methodology chosen for this investigation by aiming at the largest possible number of primary studies that address the question studied having as a strategy a research free of bias (KITCHENHAM, 2004); thus, the quality of SLR depends on the quality of the primary sources used (SAMPAIO; MANCINI, 2007). For this, the present study describes all the choices made during the SLR process and the results found, being divided into four sections. The first is this, the introduction, the second presents the steps to develop the work and the third consists of the description of the results obtained. Finally, the conclusions are presented.

Methodology

Kitchenham (2004) and Brereton et al. (2007) argue that the SLR process should be divided into three phases: planning, conduction and reporting. Similarly, Biolchini et al. (2005) also distinguish three major phases: planning, execution and analysis of results. It is worth mentioning that for these authors, each of these phases consists of smaller steps, and the steps cited by both works are similar, the only the differentiation being in the allocation of these steps in these phases.

STAGES OF A SYSTEMATIC LITERATURE REVIEW

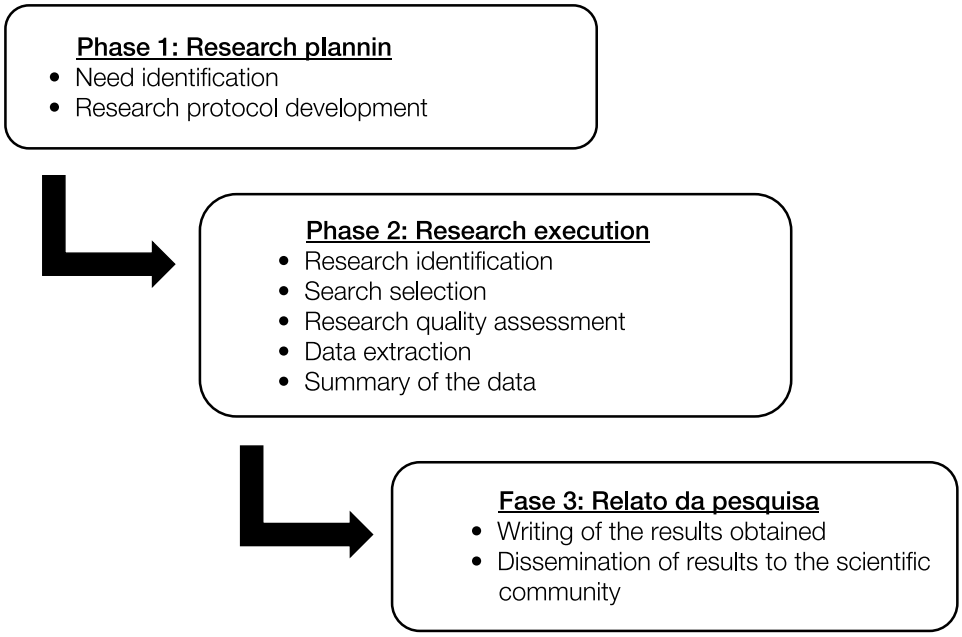
In the initial phase of an SLR, called planning, it is necessary to justify the research to be carried out by identifying an existing gap and to develop a research protocol in which the methods to be used must be specified and described, keeping in mind to follow them strictly at the time of their application (KITCHENHAM, 2004). Similarly, according to Biolchini et al. (2005), in the stage called planning, it is necessary to specify the aspects of three questions: formulation of the question, selection of sources of primary studies and selection of studies.

In the intermediate phase, called conduction, the research itself is performed based on the research protocol created (BIOLCHINI et al., 2005). This phase involves everything from identifying and selecting research to assessing the quality of these studies and synthesizing the data discussed (KITCHENHAM, 2004).

Finally, the final phase of SLR comprises the report of the research carried out, having in mind to disclose the results obtained through a technical report, thesis or publication (KITCHENHAM, 2004). Each of these steps is described in detail below.

The steps are described according to the structure proposed mainly by Kitchenham (2004) and also by Biolchini et al. (2005). **Figure 1** presents an overview of the research phases of this article.

Figure 1 Phases and stages of an SLR



Source: Authors' adaptation of Kitchenham (2004) and Brereton et al. (2007).

RESEARCH PLANNING

The first phase of an SLR - planning - consists of two stages: (1) identification of the need for a systematic review and (2) development of a review protocol (KITCHENHAM, 2004).

Similarly, according to Biolchini et al. (2005), in the planning stage it is necessary to specify the aspects of three questions: formulation of the question (focus on quality and breadth of the proposed question), selection of the sources of primary studies (data sources to be consulted, languages to be searched, strings search, among other aspects) and the selection of studies (inclusion and selection criteria, types of research to be considered and procedures for evaluating studies).

Identification of the need for research

The identification of the need for a systematic review arises from the lack of a summary of all available information about a given phenomenon in an impartial way,

aiming to reach some general conclusion through individual studies or even to find new approaches for future research. (KITCHENHAM, 2004).

For an organization to remain competitive in the current scenario (intense, dynamic and global) it is essential to develop new products, services or business models that have commercial potential (THOMOND; LETTICE, 2002). Innovations are capable of creating additional (or even new) value for customers and, thus, serve as a basis for the differentiation of products and services offered by organizations (HITT; IRELAND; HOSKISSON, 2011).

The term innovation was defined by Hitt, Ireland and Hoskisson (2011, p. 373) as "the process of creating a commercial product from an invention", and in the authors' understanding the term "invention" refers to the "act of creating or developing a new product or process".

Since innovations play a fundamental role in creating competitive advantages, organizations are concerned with keeping pace with the changes that arise so as not to be left behind in relation to other market players (BENCKE; GILIOLI; ROYER, 2018). An organization, when introducing an innovation in the market whose reproduction by other organizations is not satisfactory, creates a competitive advantage in comparison with its competitors, either due to lack of resources or due to difficulties in general (CONTO; ANTUNES JR.; VACCARO, 2016; HITT; IRELAND; HOSKISSON, 2011).

ICT are responsible for changes in society (SILVA; MACIEL, 2015) and education, mainly higher education, is equally impacted by this context (GARRISON; KANUKA, 2004), with technology taking on the role of breaking the barrier of distance in teaching and also to disseminate information with greater speed (TORRES et al., 2014).

Due to an increasing demand from students (current and future ones) for better teaching and learning experiences, HEIs are constantly challenged to remain competitive (GARRISON; KANUKA, 2004). One possibility to improve teaching and learning, then, is the insertion of ICTs (SILVA; MACIEL, 2015) together with the choice of appropriate methodologies (SCHIEHL; GASPARINI, 2017). It is understood, therefore, that through new technologies the classroom is no longer the only space in the learning process (LEDESMA, 2011).

A business model describes a company (or even a business sector) with a holistic approach, in such a way as to specify the agents that interact with the company and how those interactions create value and are translated into products and services for customers (SOHRABI; VANANI; IRAJ, 2019). The first specific objective comes from the understanding that the insertion of ICT in the context of higher education changes aspects of a business model (SMITH et al., 2008; VIGNARE; GEITH; SCHIFFMAN, 2006), such as strategies, service provision, cost structure, revenue sources, among others.

Osterwalder, Pigneur and Tucci (2005) evaluated the main aspects considered by other authors with regard to the analysis of a business model. According to the authors, these aspects are: value proposition, customer segment, channels, relationship, value configuration, capacity, partnerships, cost structure and revenue model.

According to the exposed context, the first guiding question of the proposed SLR is arrived at:

Q1: *How does blended learning impact the HEI business model?*

The term blended learning was understood as the union of particular forms of teaching through the use of technology and gained notoriety based on this aspect (OLIVER; TRIGWELL, 2005). However, despite being widespread, the term remains poorly defined (HAN; WANG; JIANG, 2019; LIMA, 2017; MEDINA, 2018; OLIVER; TRIGWELL, 2005). Despite the existence of several different definitions in the literature, there is something in common: the integration of face-to-face and virtual models (SILVA; MACIEL, 2015).

Although blended learning is in increasing use, there is a lack of studies in the literature that address its theoretical foundations and considerations about its implementation to increase the performance achieved through this teaching modality (COSTA et al., 2012; SOUSA; SCHLÜNZEN JR., 2018). Similarly, Sousa and Schlünzen Jr. (2018) indicate the need to understand the strengths and limitations of the integration of the virtual and physical environment, as well as the level of adequacy on the part of the students. Thus, the second and last guiding question of this SLR is:

Q2: *What are the advantages and disadvantages perceived by students from the use of blended learning by HEIs?*

Based on these two guiding questions, the research protocol was structured, aiming to gather evidence and information to find possible answers.

Research protocol

The protocol, according to Kitchenham (2004), specifies the methods that will be used in the execution of the SLR containing the questions that the review intends to answer, the strategies that will be used to find the primary studies (search strings, data sources), how the selection of studies will be made (selection and exclusion criteria), the way in which the evaluation of the quality of the articles will be carried out (list containing the aspects to be analyzed and possible scoring scales), the data extraction strategies (such as information will be extracted from studies that pass the adopted criteria and how this information will be tabulated) and data synthesis (specification of how the data analysis will be done, if any statistical analysis is intended and, if so, which technique will be used). This topic will focus on presenting all the defined strategies.

After defining the questions to be investigated in this research, the next step was to define the databases in which the search would be carried out. **Table 2** shows the databases chosen along with the justifications.

Table 2 Databases to be used

Database	Justification
Elsevier (Science Direct)	International database launched in 1997 with approximately 2,500 available journals, distributed in four areas: physical sciences and engineering, biological sciences, health sciences and social and human sciences.
SciELO	Digital library with free access to Brazilian scientific journals.
Web of Science	International database with access to all areas of knowledge whose quality is recognized in the scientific community. It currently covers about 12 thousand journals. It also offers tools for analyzing citations, references and the H index.

Scopus	Database of abstracts and citations of articles for academic journals, currently covers about 19,500 titles and 5,000 international publishers. In addition, it covers approximately 16,500 international peer-reviewed journals in the scientific, technical and medical and social sciences fields.
ProQuest	International research platform containing 10 databases, including the ERIC (Education Resources Information Center), launched in 1966, considered the largest education database in the world.

Source: Prepared by the authors.

To define the search strings, as suggested by Kitchenham (2004), an exploratory search was first carried out (based on the Google Scholar database) with the objective of defining the keywords used in the field of knowledge to be searched. The studies used for this definition were Costa et al. (2012), Lima (2017), Torres et al. (2014), Silva and Maciel (2015), Conto, Antunes Jr. and Vaccaro (2016), Schiehl and Gasparini (2017) and Bencke, Gilioli and Royer (2018).

After conducting this exploratory research, four concepts to be investigated were defined, as well as their synonyms based on the research questions and the objectives of the systematic review to be carried out. Concepts number 1 and 2 serve as a filter for the scope of the intended research: application of blended learning in higher education. Concept number 3 refers to the first research question and concept number 4 the second research question. **Table 3** presents the researched concepts and synonyms.

Table 3: Concepts and their synonyms to be searched in the search strings

Concept 1	Concept 2	Concept 3	Concept 4
Ensino híbrido	Ensino superior	Modelo de negócios	Vantagens
Educação a distância	Faculdade	*Business model*	Desvantagens
Blended learning	*High education*		*Benefits*
B-Learning	*Higher education*		*Disadvantages*
	College		
	University		

Source: Prepared by the authors.

The defined concepts were joined to create the strings to be used as a means of advanced search in the defined databases. The joint of concepts involved both Portuguese and English languages. Due to the fact that studies in Portuguese also adopt the term blended learning, in strings 1 and 3 we chose to keep the terms blended learning and b-learning. **Table 4** shows the relationship between the defined concepts and the search strings created.

Table 4 Relationship between concepts and created strings

String	Concept
Nº 1	1 + 2 + 3 (in portuguese)
Nº 2	1 + 2 + 3 (in english)
Nº 3	1 + 2 + 4 (in portuguese)
Nº 4	1 + 2 + 4 (in english)

Source: Prepared by the authors.

The strings to be used in the advanced search engines of the databases are shown in **Table 5**. The search strategy was based on the use of the strings created in the title, keywords and summary fields.

Table 5 Search strings to be used

String 1	(“*blended learning*” OR “*b-learning*” OR “ensino híbrido” OR “educação a distância”) AND (“ensino superior” OR “faculdade” OR “universidade”) AND (“modelo de negócios”)
String 2	(“*blended learning*” OR “*b-learning*” OR “*e-learning*” OR “*distance learning*”) AND (“high education” OR “higher education” OR “college” or “university”) AND (“business model”)
String 3	(“*blended learning*” OR “*b-learning*” OR “ensino híbrido” OR “educação a distância”) AND (“ensino superior” OR “faculdade” OR “universidade”) AND (“vantagem*” OR “desvantagem*”)
String 4	(“*blended learning*” OR “*b-learning*” OR “*distance learning*”) AND (“*high education*” OR “*higher education*” OR “*college*” or “*university*”) AND (“*benefit**” OR “*disadvantage**”)

Source: Prepared by the authors.

With the objective of separating the studies that fit the objectives / questions of this research, the inclusion and exclusion criteria were defined and are presented in **Table 6**.

Table 6 Inclusion and exclusion criteria of the results obtained

Inclusion criteria
IC1 – Published scientific articles that applied the blended learning method in HEIs and that reported the advantages perceived by the students.
IC2 – Published scientific articles that applied the blended learning method in HEIs and that reported the disadvantages perceived by the students.
IC3 – Published scientific articles that analyzed the changes caused by blended learning in the IES business model or that analyzed the changes that occurred due to its implementation.
IC4 – Scientific articles available in full text and free of charge (via subscription to online journals of the University of São Paulo).
IC5 – Scientific articles published since 2015.
Exclusion criteria
EC1 – Scientific articles published in a language different than Portuguese or English.
EC2 – Other literature that is presented in a format different than a scientific article.
EC3 – Duplicate scientific articles.
EC4 – Scientific articles that do not report the experience of applying the blended learning method in higher education or its impacts on the business model of the HEIs.
EC5 – Scientific articles from secondary or tertiary research.
EC6 – Scientific articles that do not meet at least 50% of the quality criteria.

Source: Prepared by the authors.

According to Kitchenham (2004), a more detailed assessment of the quality of the studies found in the search is necessary and, for that, it is possible to write a list containing the items to be evaluated. The defined quality assessment criteria

are presented in **Table 7**. The first and second criteria aim to assess the adequacy of the work to the objectives of this research. The third criterion evaluates the work structure through its proposed objectives and the connection with the methodology. The fourth and fifth criteria, in turn, assess the quality of work through its impact.

Table 7 Study evaluation criteria

Evaluation criteria	Score
EC1 – The study presents practical or theoretical contributions related to the guiding questions of this research?	Yes: 1; No: 0.
EC2 – Do the results discuss the advantages and disadvantages perceived by the students and / or impacts from the perspective of the HEIs?	Yes: 1; No: 0; Em partes: 0,5.
EC3 – Is the methodology consistent with the proposed objectives?	Yes: 1; No: 0; Nealy: 0,5.
EC4 – Does the study have citations?	Yes: 1; No: 0.
EC5 – Is the study published in journals that have quality indicators (H index or JCR)?	Yes: 1; No: 0.

Source: Prepared by the authors.

Finally, the studies that were found that met the criteria are suitable to be read in full and subsequently analyzed.

RESEARCH CONDUCTION

The second phase of an SLR, called conduction, consists of five stages: (1) identification of research; (2) selection of primary studies; (3) quality assessment; (4) data extraction; and (5) data synthesis (KITCHENHAM, 2004). It is worth remembering that both the strategy and the criteria to be used in the execution of this phase must already be defined in advance in the research protocol.

The first step to be taken was to use the search strings defined in the specified databases using the advanced search with specification of “title-abs-key” (title, abstract and keywords). In this search phase, the inclusion criteria 5 and the exclusion criteria 1 and 2 were applied, as the advanced searches of the chosen bases

allowed the use of these filters. It is important to say that the access to the chosen databases was made through the subscription of online journals of the University of São Paulo. Thus, the results may vary according to the collections included or excluded, depending on the subscription present in other universities and educational institutions. **Table 8** presents the bases, the strings used and the results obtained.

Table 8 Information about the researches carried out and the results obtained

Databases	*Strings used*	Research date	Results	Results after IC5, EC1 and EC2
Science Direct	2	04/06/2020	1	0
Science Direct	4	04/06/2020	39	16
SciELO	*	11/06/2020	19	3
Web of Science	2	04/06/2020	23	5
Web of Science	4	04/06/2020	1.260	269
Scopus	2	04/06/2020	94	12
Scopus	4	04/06/2020	889	204
ProQuest	2	11/06/2020	49	14
ProQuest	4	11/06/2020	3.163	276

Source: Prepared by the authors.

As these are different databases, it is expected that some differences exist in the search engines. Science Direct's advanced search does not support the asterisk (*); in this case the asterisks in string 4 have been removed. When using strings 1 and 3 in the SciELO database, no results were obtained and, to increase the scope of the research by inserting another database, it was decided to use only ("blended learning" OR "b-learning" OR "Hybrid education" OR "distance education") in the summary search field.

In the Web of Science, the specification used to carry out the research was "topic" (covers the author's title, abstract and keywords). In Scopus, the title-abs-key specification (title, abstract and keywords) was used in the search. In ProQuest the specifications applied were: search "anywhere, except full text - NOFT". In all

databases, searches were filtered with the type of document being an article (using exclusion criterion 2) and the source being academic journals.

After conducting the research, data extraction occurred using the mechanisms offered by the databases themselves. Namely: the bases of Science Direct were extracted in HTML format and the bases of SciELO, Web of Science, Scopus and ProQuest were extracted in CSV format. The relationship with the titles of the works, their respective string and the database used was created in Microsoft Office Excel 2016.

Initially, there were 799 articles obtained from the searches made. The first treatment to be performed was the exclusion of the duplicated ones (exclusion criterion 3), and in this step 186 studies were removed. Then the titles of all 613 remaining papers were read (given the impossibility of reading all selected articles in full) in the light of inclusion criteria 1, 2 and 3 and exclusion criteria 4 and 5. In this filter, 149 articles were selected, and 464 were removed.

The next step was to read the summary of the selected articles in order to assess more carefully their suitability or not to the guiding questions of the proposed review. As in the title verification stage, inclusion criteria 1, 2 and 3 and exclusion criteria 4 and 5 were again applied, but the use of inclusion criterion 4 was also added (since it is necessary for the reading of the summary).

As a result, 58 articles were removed, as the subscription to online journals at the University of São Paulo did not allow access to the works for free. Thus, the summary of 91 papers was read, with 30 articles selected and 61 rejected. Finally, the last step for the selection of articles to be used as the basis of the research was the evaluation of quality using the criteria already mentioned.

In this last selection stage, 9 articles were rejected because they did not achieve a score equal to or higher than 50% according to the defined quality criteria. Thus, the final sample of studies to be used as a basis to answer the questions proposed in this research was of 21 articles conducted in 16 different countries: Australia, China, Spain, the USA, France, Jamaica, Japan, Nigeria, Oman, Poland, the United Kingdom, Russia, Serbia, Sweden, Turkey and Vietnam.

In all, the sample included 20 different journals, each one with one article, with the exception of Global Health Education, which appears in the final sample with two articles. The year with the most publications was 2016, with 6 studies, followed

by 2018, with 5. Each selected study has, on average, 8 citations. Finally, 11 of the selected papers were taken from the Web of Science database, 5 from the ProQuest database, 4 from Scopus and 1 from Science Direct.

SYSTEMATIC REVIEW'S REPORT

The last stage of SLR consists in the effective communication of the results achieved and normally this type of research takes two formats: (1) a technical report or part of a thesis or (2) publication in journals, according to Kitchenham (2004). The author also suggests that the following sections are present in the report: title, authorship, summary, context, questions, methods, included and excluded studies, results, discussion, conclusions, acknowledgments, conflicts of interest, references and appendices. In this context, this article alone constitutes the account of the SLR conducted, since its format is suitable for publications.

Analysis of Results

The following topic presents the results obtained by the final sample of the performed SLR. Returning to the guiding questions of the research carried out, with this process we seek to answer: (1) How does blended learning impact the HEI business model? and (2) What are the advantages and disadvantages perceived by students from the use of blended learning by HEIs?

BLENDED LEARNING AND THE HEI BUSINESS MODEL

After reading in full the 21 papers selected for this research, 5 of them mentioned changes or difficulties in the implementation and execution of blended learning that can be related to the business model of the HEIs. There is a concentration of studies focusing on the experience or perception of teachers (understood as key partners in the business model of an HEI) to the detriment of other aspects.

Among the main findings is the need for technical support for the transition and execution of blended learning to occur (PORTER; GRAHAM, 2016; PROTSIV; ATKINS, 2016; THURAB-NKHOSI, 2018; ZHU, 2015); the clear definition of strategy (THURAB-NKHOSI, 2018; ZHU, 2015); good alignment between reasons for its

adoption between teachers and institution (PORTER; GRAHAM, 2016; PROTSIV; ATKINS, 2016); leadership and well-defined structure (THURAB-NKHOSI, 2018; ZHU, 2015), increased costs (KUMPU et al., 2016); adaptation and pedagogical support; (PORTER; GRAHAM, 2016; PROTSIV; ATKINS, 2016) and increase the workload of teachers and staff working on adapting courses (KUMPU et al., 2016; PROTSIV; ATKINS ,, 2016).

Kumpu et al. (2016) analyzed the implementation of blended learning with regard to the cost structure of the HEIs. As a result, the authors point out that, in fact, the costs involved are substantially higher than those involved in the face-to-face teaching method (even though they have fewer hours in the classroom).

Still according to Kumpu et al. (2016), this occurs mainly due to the higher costs of the professionals involved, due to the increased workload resulting from the need to create new materials online and learn new technologies. This result goes in the opposite direction of other works present in the literature that mention the cost reduction with the implementation of blended learning (MARSH; MCFADDEN; PRICE, 2004; ROSENTHAL; WEITZ, 2012; VAUGHAN, 2007).

Thurab-Nkhosi (2018) studied the perceptions of administrators in positions of dean or administrative officers of a blended learning initiative at a Caribbean university. As a result, the author mentions that, in the perception of the interviewed administrators, greater recognition and clarity is needed with regard to blended learning in topics such as strategy (alignment and definition of roles), structure (leadership and followers) and support (software, hardware and technician)).

Precisely the three topics that deserve more attention, according to Thurab-Nkhosi (2018), are those studied by Porter and Graham (2016). The authors in question analyzed which type of decision regarding strategy, structure and support facilitates or prevents the adoption of blended learning by HEI teachers together with the classification of respondents in relation to the level of technology adoption.

As a result, Porter and Graham (2016) indicate that the factors that most influence the adoption or not of blended learning by HEI teachers are the availability of sufficient infrastructure, technical support, pedagogical support, data that prove the benefits of blended learning and alignment between the reasons for adopting this method between teachers and the institution.

Protsiv and Atkins (2016) studied the experiences and perceptions of teachers in implementing courses in the blended learning format. In view of the difficulties, there is the necessary adaptation of roles and ways of working, lack of institutional and technological support, alignment between course objectives and teaching preferences with the available technologies and the increase in the workload, which is not always accompanied by rewards and incentives.

Finally, Zhu (2015) analyzed the perception of Chinese HEI teachers about organizational culture and the adoption of technologies (including online education). As a result, the author points out that the adoption of new technologies involves a major process of change in aspects such as institutional structure, ideologies, development of objectives, priorities, evaluation systems and target audience. Also according to Zhu (2015), for an educational institution to be innovative, it is necessary to pay attention to some elements: orientation for innovation, development of objectives, collaborative environment among members, and leadership as a structurer and support for innovation.

Considering that a business model describes the logic of creating, delivering and capturing value on the part of an organization, in the context of using blended learning, and considering the aspects observed in the literature.**Table 9** below summarizes the findings found in SLR fulfilled.

Table 9 Aspects of the business model of a higher education institution that impact the implementation of blended learning

Dimension	Influence on the business model	Authors
Technical support	Need for technical support for the transition and execution of blended learning to occur.	Zhu (2015), Porter e Graham (2016), Protsiv e Atkins (2016) and Thurab-Nkhosi (2018)
Costs	Some authors pointed to the increase in cost, mainly due to the workload of the professionals involved. Others score in the opposite way, due to the decrease in the necessary physical space and less need for professionals.	Marsh, McFadden e Price (2004), Vaughan (2007), Rosenthal e Weitz (2012) and Kumpu et al. (2016)

Strategy definition	Clarity of the role of blended learning in relation to the adopted strategies and alignment between structure-support-strategy of the educational institution.	Zhu (2015) and Thurab-Nkhosi (2018)
Alignment between teachers and institution	The motivators behind the adoption of blended learning by teachers and institutions must be aligned. There needs to be a common goal (s) behind efforts to implement it.	Porter e Graham (2016) and Protsiv e Atkins (2016)
Leadership	Clear definition of those responsible for implementing blended learning in educational institutions and also of the roles of those involved (leadership and followers).	Zhu (2015) and Thurab-Nkhosi (2018)
Work load	The workload of teachers tends to increase during the implementation of blended learning due to the need to create and adapt the materials used (videos, exercises, among others).	Kumpu et al. (2016) and Protsiv e Atkins (2016)
Pedagogical support for teachers	The implementation of blended learning involves changes in the planning and development of teaching and learning activities, means of assessment, approach with different target audiences and even the adoption of new technologies.	Porter e Graham (2016) and Protsiv e Atkins (2016)

Source: Prepared by the authors.

Thus, if an institution considers adapting its business model for the courses offered (either in person or at a distance) to a hybrid model, the aspects mentioned must be considered.

ADVANTAGENS AND DISADVANTAGES OF *BLENDED LEARNING* FROM THE STUDENTS' PERSPECTIVE

Through the final sample obtained in the systematic review, it was possible to notice seven major advantages perceived and cited by the students themselves who had contact with blended learning. **Table 10** presents these advantages and their descriptions based on the works selected for analysis

Table 10 Advantages perceived by HEI students in blended learning

Advantaged cited	Description
Flexibility	Greater flexibility when it comes to when and where to study.
Individualized learning	Personalization of the study that makes it possible to focus on the individual needs of the students, in addition to allowing each one to go through what is proposed at their own pace.
Motivation	Greater motivation and interest in the subjects taught due to the diversity of activities and content.
Various teaching approaches	Use of different teaching and learning approaches that suit students (video classes, texts, quizzes, forums, podcasts, among others).
Performance	Higher performance (measured by grade) compared to students of the traditional model (face-to-face).
Contents	Constant availability of the contents taught and ease of accessing them, in addition to their diversity of formats (videos, texts, exercises, among others).
Time	Better use of time by reducing the amount of time usually spent on transportation.

Source: Prepared by the authors.

There is a diversification of advantages perceived by students, ranging from aspects related to the teaching and learning process (different approaches used, availability of materials on online platforms and higher performance) to aspects that

are external to the teaching and learning process (such as greater time savings, which can be used, among other things, for the study itself). **Table 11** presents the list of authors who mentioned these advantages in their research.

Table 11 List of perceived advantages and the authors who cite them

Advantage	Authors
Flexibility	Buran e Evseeva (2015), Grabinski, Kedzior e Krasodomska (2015), Karabulut-Ilgu e Jahren (2016), Protsiv e Atkins (2016), Herbert et al. (2017), Pinto-Llorente et al. (2017), Saltan (2017), Shand e Farrelly (2018), K. e Al Maskari (2019), Ma, Li e Liang (2019) and Warren et al. (2020)
Individualized learning	Buran e Evseeva (2015), Herbert et al. (2017), Pinto-Llorente et al. (2017), Ma, Li e Liang (2019), Fola-Adebayo (2019) and Warren et al. (2020)
Motivation	Buran e Evseeva (2015), Herbert et al. (2017), Pinto-Llorente et al. (2017), Bouilheres et al. (2020) and Warren et al. (2020)
Various teaching approaches	Protsiv e Atkins (2016), Herbert et al. (2017), Pinto-Llorente et al. (2017), Saltan (2017) e Ma, Li and Liang (2019)
Performance	Alducin-Ochoa e Vázquez-Martínez (2016), Milic et al. (2016), Marchalot et al. (2018), The e Usagawa (2018) and Fola-Adebayo (2019)
Contents	Grabinski, Kedzior e Krasodomska (2015), Pinto-Llorente et al. (2017), Saltan (2017), Shand e Farrelly (2018), Ma, Li e Liang (2019) and K. e Al Maskari (2019)
Time	Grabinski, Kedzior e Krasodomska (2015), Saltan (2017), K. e Al Maskari (2019) and Fola-Adebayo (2019)

Source: Prepared by the authors.

Other advantages also mentioned in the analyzed papers, but with less frequency, were: better communication with the teacher (GRABINSKI; KEDZIOR; KRASODOMSKA, 2015; K.; AL MASKARI, 2019); immediate feedbacks (HERBERT et

al., 2017; PINTO-LLORENTE et al; 2017); possibility of advancing studies if all content was made available from the beginning (KARABULUT-ILGU; JAHREN, 2016); possibility of using online quizzes (HERBERT et al., 2017); and lower dropout rates (FOLA-ADEBAYO, 2019).

With regard to the disadvantages perceived by higher education students in relation to blended learning, it was also possible to identify factors in common. **Table 12** shows the disadvantages and their description based on the selected works.

Table 12 Disadvantages perceived by students in blended learning

Disadvantage cited	Description
Connection	Internet quality that causes problems accessing the online platform, its materials and its activities.
Responsibility and time management	The need for students to be disciplined with their studies online, manage their time well and organize independently.
Technological knowledge	Lack of prior knowledge of computers or platforms used and how activities should be carried out online.
Communication	Problems with the efficiency of communication in the online environment.
Non-immediate responses	Impossibility to ask and get answers the moment doubts arise.
Information excess	Information overload that can make it difficult to understand the subject studied and lead to confusion.
Lack of will and / or resistance	Lack of willingness to learn online, problems with motivation and even resistance to change.

Source: Prepared by the authors.

It is noted that the mentioned disadvantages can be divided into two major groups. First, those that refer to the student's own profile: responsibility and time management and lack of will and / or resistance. Second, those that are connect to prerequisites and smooth running of the course: connection, technological knowl-

edge, communication, non-immediate responses and excessive information. **Table 13** presents the list of authors who cited these disadvantages in their research.

Table 13 List of perceived disadvantages and the authors who quote them

Desvantagem	Autores
Connection	Protsiv e Atkins (2016), Herbert et al. (2017), Saltan (2017) e K. and Al Maskari (2019)
Responsibility and time management	Buran e Evseeva (2015), Grabinski, Kedzior e Krasodomska (2015), Herbert et al. (2017), Shand e Farrelly (2018) and Fola-Adebayo (2019)
Technological knowledge	K. e Al Maskari (2019) and Ma, Li e Liang (2019)
Communication	Karabulut-Ilgu e Jahren (2016) and Saltan (2017)
Non-immediate responses	Grabinski, Kedzior e Krasodomska (2015) and Karabulut-Ilgu e Jahren (2016)
Information excess	Ma, Li e Liang (2019) e K. and Al Maskari (2019)
Lack of will and / or resistance	Buran e Evseeva (2015), Saltan (2017) and Fola-Adebayo (2019)

Source: Prepared by the authors.

Other disadvantages mentioned, however less frequently, are: lower retention rates (BURAN; EVSEEVA, 2015); lack of direct contact with the teacher (GRABINSKI; KEDZIOR; KRASODOMSKA, 2015); less content retention (SALTAN, 2017) and financial expenses inherent to the use of this method, such as internet and infrastructure (FOLA-ADEBAYO, 2019).

From the studies carried out, it was observed that some of these disadvantages can be overcome considering some aspects. The existence of negative points generated by a lack of prior knowledge of how to deal with certain situations can be noted. For example, with regard to students' sense of responsibility, one approach possibility would be bring up some time management technique or tool at the beginning of the course / discipline. Similarly, it would be interesting to make videos

available that teach students how to navigate virtual learning environments. Other aspects such as communication problems and non-immediate responses can be overcome by determining rules, such as, for example, alerting students of the maximum response time by tutors and teachers.

Finally, **Table 14** shows the relationships between the studies analyzed in this topic and the mentioned advantages and disadvantages. The advantages represent (1) flexibility, (2) individualized learning, (3) motivation, (4) different teaching approaches, (5) performance, (6) content and (7) time. Disadvantages represent (8) connection, (9) responsibility and time management, (10) technological knowledge, (11) communication, (12) non-immediate responses, (13) excessive information and (14) unwillingness and / or resistance.

Table 14 Advantages and disadvantages cited by author (s)

Author (s)	Advantages							Disadvantages						
	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Bouilheres et al. (2020)			X											
Warren et al. (2020)	X	X	X											
Fola-Adebayo (2019)		X			X		X		X					X
K. e Al Maskari (2019)	X					X	X	X		X			X	
Ma, Li e Liang (2019)	X	X		X		X				X			X	
Marchalot et al. (2018)					X									
Shand e Farrelly (2018)	X					X			X					
The e Usagawa (2018)					X									
Herbert et al. (2017)	X	X	X	X				X	X					
Pinto-Llorente et al. (2017)	X	X	X	X		X								
Saltan (2017)	X			X		X	X	X			X			X
Alducin-Ochoa e Vázquez-Martínez (2016)					X									
Karabulut-Ilgu e Jahren (2016)	X										X	X		

Milic et al. (2016)					X									
Protsiv e Atkins (2016)	X			X				X						
Grabinski, Kedzior e Krasodomska (2015)	X					X	X		X			X		
Buran e Evseeva (2015)	X	X	X						X					X

Source: Prepared by the authors.

It is noted that the sample of works analyzed in this research showed more advantages than disadvantages arising from the adoption of blended learning, with a predominance of the factor (1) flexibility. Other than that, however, it is clear that there is little constancy of certain advantages or disadvantages. Furthermore, it is not possible to state that a certain advantage or disadvantage is necessarily linked to another advantage or disadvantage. Still, a last important point to take into account is that the studies were developed in several countries, which may also have influenced the heterogeneity of the results presented here, pointing to the need for further investigations region wise.

Conclusions

The current scenario of the pandemic presents the need for reflection on new ways of teaching and learning, which are not dependent only on face-to-face contexts, in relation to the physical and temporal space. Thus, the adoption of hybrid methods or even known as blended learning can bring some possibilities. In this sense, the guiding question of this research was “What aspects characterize the impact of blended learning on higher education in HEI and its students?”. This research question was directed, considering as a research objective to identify the aspects that characterize the impact of blended learning in higher education in HEI and its students. To achieve this goal, an SLR was conducted with the two specific objectives of this research in mind: (1) recognizing, through SLR, the aspects that characterize the impact of blended learning in HEIs and (2) recognizing, through SLR , the aspects that characterize the impact of blended learning on students,

separating them into advantageous and disadvantageous The SLR was carried out in five databases through four search strings. The final sample resulting from SLR was composed of 21 works.

With regard to the first specific objective of this research, it is noted that the studies analyzed focus only on some of the elements that constitute a business model (with a great focus on the adoption of new technologies by teachers and their perceptions), and not on the impact blended learning has on the HEI business model as a whole and in its different aspects.

However, evidences can be cited that the implementation and execution of blended learning in HEIs in fact change the existing business model, at least in the elements studied in the selected works. For example, the cost structure that gains new factors from blended learning, the adoption or not of this teaching model by teachers (an important group of business model partnerships) and the diversification of affected customers (in this case, students).

Thus, with regard to future studies related to the impact of blended learning on the business model of HEIs, two possible directions are identified. First, addressing the impact of implementing blended learning on other aspects of a business model (for example, partnerships) or even a holistic analysis of those aspects. Second, there is a concentration of studies addressing the perception of teachers about the implementation and execution of this modality, but it is also necessary to analyze other elements that constitute the educational institutions as a whole (for example, the technical team that supports the teachers).

Based on the second specific objective of this research, it is noted that some aspects considered as advantages and disadvantages stand out before the others, being most cited by students who had contact with blended learning in higher education. These aspects are crucial for planning, developing and executing any strategy that involves blended learning, since these advantages must be present to increase student satisfaction and actions to mitigate or avoid disadvantages should be considered.

Among the advantages mentioned, the following stand out: flexibility to study when and where you want, individualized learning in which students can follow their own pace and focus on points where they have difficulty and the constant availability of teaching materials and consequent ease of access to them. On the oth-

er hand, keeping in mind the disadvantages, the highlights are: the self-discipline and responsibility required of the students themselves in their studies, the problems caused by the poor quality of the internet connection and the lack of willingness and / or motivation of the students to learn at home online. However, with the exception of the flexibility cited as an advantage, no other aspect is addressed in more than 50% of the studies analyzed.

It is worth mentioning, however, that there are aspects that appear either as advantages or disadvantages. For example, in three researches analyzed, the authors mentioned that communication with teachers was an advantage perceived by students, but communication itself also appears as a disadvantage. Some authors who are not present in the final SLR sample indicate communication as an advantage: Costa et al. (2012) and Lai, Lam and Lim (2016). In this sense, a suggestion for future research is to identify which actions capable of generating a positive perception in students about communication can be adopted by teachers and institutions.

Another possibility for future research concerns the identification of patterns in the advantages and disadvantages based on the place where blended learning was adopted. This suggestion is justified by the premise that different regions of the world have unique characteristics that can favor or hinder the implementation of hybrid education. A simple example of this is the quality of the internet, in addition to deeper cultural aspects.

Furthermore, in this SLR, no relationship was drawn between teaching and learning methods adopted in hybrid teaching with the advantages and disadvantages perceived by students. Since blended learning invariably involves choosing and executing different pedagogical approaches, another suggestion for future research is to relate these approaches to positive and negative points in the students' perception.

During the analysis of the selected works, it was noted that the studies often made reference to the disadvantages perceived by the students through the word "challenge" or "challenges" and, therefore, a systematic review including this term in the strings is recommended , even more if we consider that in this SLR we find more work about advantages than disadvantages.

As shown in **Table 14**, it was not possible to draw a list of advantages and disadvantages that are mentioned together or that do not appear together. This is

due to the great dispersion of the studied aspects. It is also possible to mention that it would be interesting to investigate which advantages (or disadvantages) work harmoniously together. In other words, are there advantages that, if used together, are enhanced? Or, are there any disadvantages that are inhibited in the perception of a certain advantage?

Finally, since within the final sample of this SLR there was a single study stating that student retention was higher in the hybrid model, research is suggested to verify whether in fact blended learning increases retention (or if, on the contrary, even even decreases).

The authors' knowledge only in Portuguese and English should be considered a limitation of this research, since studies published in other languages (such as Spanish) were found through the search engines, but discarded given the impossibility of being read. In addition, the choice of databases to be used followed the authors' prior knowledge, and possible good databases containing publications on blended learning may not have been used.

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