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## The Influence of Factors that Stimulate University Students in Relation to the Attitude Towards the Use of the Blended Learning Approach\*

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### ABSTRACT

This article aims to investigate the influence of factors that stimulate university students in relation to the attitude towards the use of the Blended Learning (BL) approach. The study was carried out in a private Higher Education Institution located in the city of São Paulo in undergraduate courses. The proposed model was adapted from Sabah (2019) in a survey (n=532). The research presents a quantitative approach and the use of Structural Equation Modeling. The results indicated that only 3 of the 25 formulated hypotheses were not supported having in common the Perceived Utility construct. In view of this, it was found that online activities were not mandatory, and it is up to the teacher to point out the importance of accessing materials before classes, as well as employing active methodologies; for tutors to be available when required and to stimulate awareness of the importance of online activities, and for course colleagues to recognize the importance of online discussions in the learning process. Finally, students who have demonstrated “high intensity” in liking AVA have a greater facility in perceiving the characteristics of BL. This effect also occurred in the intergroup average of the technical domain of AVA (low and high domain).

### KEYWORDS

University education. Management courses. Blended learning. University students. Attitude to use.

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## A Influência dos Fatores que Estimulam os Estudantes Universitários em Relação à Atitude Frente ao Uso da Abordagem do Blended Learning

### RESUMO

Este artigo se propõe investigar a influência dos fatores que estimulam os estudantes universitários em relação à atitude frente ao uso da abordagem do Blended Learning (BL). O estudo foi realizado em uma Instituição de Ensino Superior particular localizada na Cidade de São Paulo em cursos de graduação. O modelo proposto foi adaptado de Sabah (2019) em um survey (n= 532). A pesquisa apresenta abordagem quantitativa e emprego de Modelagem de Equações Estruturais. Os resultados indicaram que apenas 3 das 25 hipóteses formuladas não foram sustentadas tendo em comum o construto Utilidade Percebida. Diante disso, verificou-se a não obrigatoriedade das atividades on-line, cabendo ao professor apontar a importância do acesso aos materiais antes das aulas, bem como bem como empregar as metodologias ativas; aos tutores estarem à disposição quando demandados e estimular a conscientização da importância das atividades on-line, e, aos colegas de curso para que reconheçam a importância das discussões on-line no processo de aprendizagem. Por fim, os alunos que demonstraram “alta intensidade” em gostar do AVA possuem maior facilidade em perceber as características do BL. Este efeito, também ocorreu na média intergrupal do domínio técnico do AVA (baixo e alto domínio).

### PALAVRAS-CHAVE

Ensino superior. Cursos de gestão. Blended learning. Estudantes universitários. Atitude frente ao uso.

## La Influencia de Factores que Estimulan a los Estudiantes Universitarios en Relación con la Actitud Hacia el Uso del Enfoque de Aprendizaje Combinado

### RESUMEN

Este artículo tiene como objetivo investigar la influencia de los factores que estimulan a los estudiantes universitarios en relación con la actitud hacia el uso del enfoque de aprendizaje combinado (BL). El estudio se realizó en un Institución de Enseñanza Superior privado ubicado en la ciudad de São Paulo en cursos de pregrado. El modelo propuesto fue adaptado de Sabah (2019) en una encuesta (n=532). La investigación presenta un enfoque cuantitativo y el uso del modelado de ecuaciones estructurales. Los resultados indicaron que solo 3 de las 25 hipótesis formuladas no eran compatibles, teniendo en común la construcción de Utilidad Percibida. En vista de esto, se descubrió que las actividades en línea no eran obligatorias, y corresponde al maestro señalar la importancia de acceder a los materiales antes de las clases, así como emplear metodologías activas; para que los tutores estén disponibles cuando sea necesario y para estimular la conciencia de la importancia de las actividades en línea, y para que los colegas reconozcan la importancia de las discusiones en línea en el proceso de aprendizaje. Finalmente, los estudiantes que han demostrado “alta intensidad” en el gusto por el AVA tienen una mayor facilidad para percibir las características del BL. Este efecto también ocurrió en el promedio intergrupal del dominio técnico de AVA (dominio bajo y alto).

### PALABRAS CLAVE

Enseñanza superior. Cursos de gestión. Aprendizaje combinado. Estudiantes universitarios. Actitud de uso.

## 1 Introduction

The rapid development of information technology produces opportunities for the education field (ZHANG, 2016), adding Distance Education and online learning as an option to the traditional model (GASEVIC, KOVANOVIC, JOKSIMOVIC; SIEMENS, 2014).

The integration of Digital Information and Communication Technologies (DICTs) in classroom activities has provided what is known as Blended Learning (BL) or hybrid teaching, with the “flipped classroom” being one of the modalities that have been implemented in both Basic and Higher Education. This is primarily due to the advancement of DICTs which directly impacts the offer of content in virtual learning environments (VLE) which has skyrocketed in recent years (BOWYER; CHAMBERS, 2017; BIRBAL, RAMDASS; HARRIPAUL, 2018; SPINARDI; BOTH, 2018).

Blended Learning, or a hybrid model of education, is present in renowned foreign universities, such as Harvard University and Massachusetts Institute of Technology (MIT), which have adopted the flipped classroom or inverted classroom, innovating their teaching methods with the support of technological advancements. In Brazil, this model of education is still maturing in some Higher Education Institutions (HEIs) (VALENTE, 2014; KICH, 2019).

The growth of online higher education programs in Brazil has created tension, generating ambivalence in some sectors of higher education. A positive side effect of this tension includes new learning environments that offer the potential to maximize the effectiveness of contemporary teaching and learning. This movement took on several labels, such as mixed, hybrid and combined, but Blended Learning emerged as the dominant label of an educational platform that represents a combination of classroom teaching and online learning (MOSKAL, DZIUBAN; HARTMAN, 2013).

The next phase of the process became obvious: develop an operational definition that describes Blended Learning in a way that would achieve universal acceptance and provide a solid basis for planning educational policies.

When trying to follow the guidelines of the Ministry of Education (MOE – Ministério da Educação - MEC) to incorporate Blended Learning, the educational community found it difficult to establish a definition that is viable to their particularities. Characteristics of the student population, the institution's mission, strategic planning processes, responsiveness of the faculty, student acceptance, community values, available resources, institution support, monitoring and follow-up mechanisms and many other components helped to construct a structure that made sense for a specific institutional context.

In Brazil, the standardization of semi-presential system paved the way for Blended Learning, with Ordinance no. 4,059/2004 as an important milestone for the dissemination of hybrid teaching practices. Therefore, Brazilian Higher Education Institutions (HEIs) face the challenge of implementing Blended Learning into their undergraduate courses.

This article examines the use of Blended Learning by a private HEI located in the City of São Paulo, in two undergraduate courses: Administration and Marketing Technologist. The choice of courses is due to the fact that they are courses with a large number of students, according to the Higher Education Census, released by the National Institute of Educational Studies and Research Anísio Teixeira (INEP, 2018).

The adapted model of Sabah (2019) that integrated Davis' Technology Acceptance Model (TAM) theory, Ajzen's Theory of Planned Behavior (TPB) (1985), and the Self-Determination Theory (SDT), was used as a basis by Deci and Ryan (1985) and other specific factors. This is in addition to the characteristics of Blended Learning (Perceived flexibility, Collaborative learning, Learning methodology and Self-regulated learning) to provide explanations regarding the attitude towards the use of BL.

The model proposed in this research is justified given that Blended Learning offers the potential to expand traditional teaching in the way we deal with content, social interaction, reflection, higher order thinking, problem solving, collaboration, learning and more authentic evaluation. Therefore, the objective of the article is to investigate the influence of factors that stimulate university students in relation to the attitude towards the use of the Blended Learning approach.

This article is structured in the following sections: introduction - which presents the context - literature review - with the theoretical construction and formulated hypotheses, the development of the methodological aspects, and finally, the results and final considerations.

## 2 Literature Review

### 2.1 Blended Learning as an Alternative to Traditional Teaching

The advancement of DICTs, especially the Internet, has forced HEIs around the world to rethink the way they make the teaching and learning process possible. This is to decrease the number of vacancies and increase the scope of the offer, while dealing with the issue of diversity of the different social actors involved (BIRBAL, RAMDASS; HARRIPAUL, 2018).

The traditional model of education that taught people, in which there was great emphasis on the transmission of information, no longer allows people to be prepared for a production model based on the knowledge economy (VALENTE, 2014). Thus, the need to develop people who are prepared to face the challenges of contemporary times and acquire the necessary communication skills, information literacy, collaboration, creativity and the ability to use digital technologies for a wide range of purposes, is becoming increasingly necessary (BIRBAL, RAMDASS; HARRIPAUL, 2018).

In this way, Blended Learning emerges as a viable alternative to traditional teaching, as it offers students a hybrid teaching and learning process, characterized by a deliberate combination of online and classroom interventions to instigate and support learning, in which the student takes a more active and participative posture (SPINARDI; BOTH, 2018). For Bowyer and Chambers (2017), online activities can be used to reinforce the learning carried out in the face-to-face classroom or they can serve as a basic introduction to topics before being covered more in-depth in class. Valente (2014) mentions that online activities allow for personalization of teaching, since the student can, for example, choose when, where, how and with whom he will carry out his studies.

BL is a more student-centered approach, aligned with a more constructivist perspective of teaching and learning (BIRBAL, RAMDASS; HARRIPAUL, 2018). Bowyer and Chambers (2017) corroborate by stating that for Blended Learning to work, it is necessary that the student have the ability to adopt more resilient learning strategies, as well as be motivated to complete the course, have the ability to work independently and develop the ability to study autonomously.

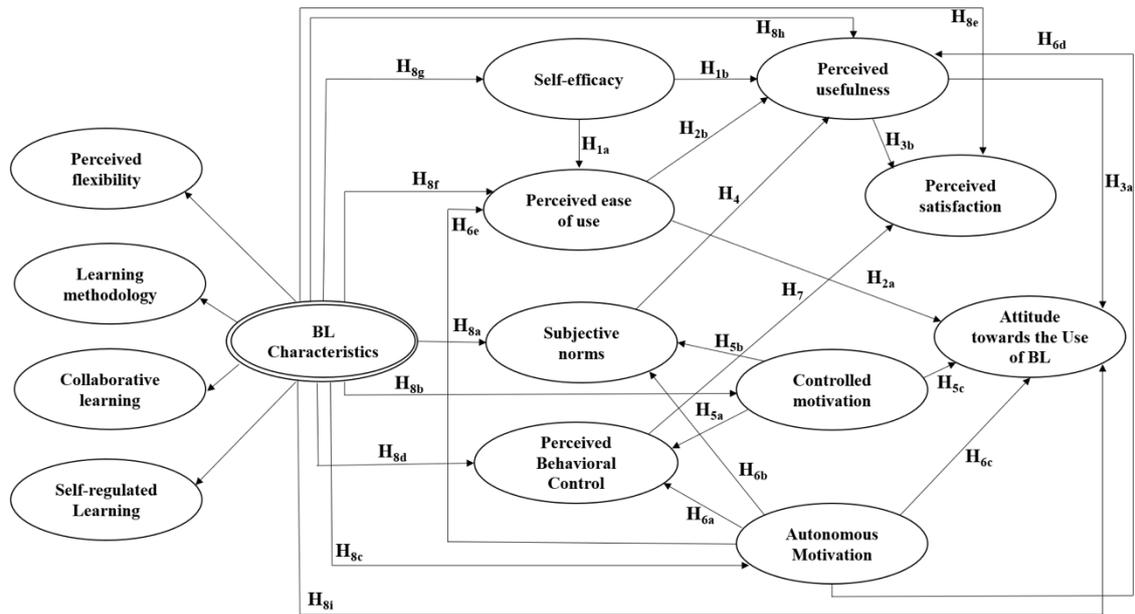
According to Valente (2014), Blended Learning can be used from basic education to higher education. In Brazil it is still more commonly used in higher education or in adult education, in view of the need for necessary autonomy on the part of those involved. The use of BL meets the desires of a generation that prefers more interactive experiences (active methodologies) based on digital media (SPINARDI; BOTH, 2018).

An additional benefit of Blended Learning is the possibility of expanding the interaction between the subjects involved in the teaching and learning process beyond the walls of the classroom, through online discussions that can occur synchronously (at the same time) and asynchronous (at different times), however the recognition of this benefit is conditioned to the perceived usefulness of the online discussion (BOWYER; CHAMBERS, 2017).

## **2.2 Construction of the Theoretical Model**

The proposed and adapted model of Sabah (2019), seen in Figure 1, illustrates the Attitude towards the use of Blended Learning as a function of different key factors related to the individual characteristics of students (Self-efficacy and Perceived Behavioral Control), cultural element (Subjective Norms), extrinsic motivations (Controlled Motivations and Perceived Usefulness), intrinsic motivations (Perceived Ease of Use, Autonomous Motivations, Perceived Satisfaction) and Blended Learning characteristics.

Figure 1. Conceptual model



Source: Adapted from Sabah (2019, p. 5).

In this model, the constructs Anxiety and Intention to Continue Using were not used, due to the outline of this research. Anxiety is a construct that needs to be analyzed along with other psychological factors such as depression, loneliness, stress, and self-esteem, which can occur in online activities. The Intention to Continue Using construct was also not used because the HEI has a tradition in the use of active methodologies and in the use of digital technologies in the classroom. Therefore, there is no way for the student to decide whether or not to continue performing activities online.

### 2.2.1 Self-efficacy

Self-efficacy can be understood as the individual judgment of a person’s abilities to perform a behavior. In this sense, some studies have supported that self-efficacy positively influences both Perceived Usefulness and Perceived Ease of Use (CHEN and TSENG, 2012; ABDULLAH and WARD, 2016) and other studies reported that a positive effect was observed only in Perceived Ease of Use (VENKATESH, 2000; TERZIS and ECONOMIDES, 2011). People with high self-efficacy have high self-confidence in their skills and ability to perform tasks. Therefore, it is expected that university students with high self-efficacy will find Blended Learning accessible to use and that they will make full use of the system to improve their academic performance (BALAKRISHNAN and GAN, 2016). Conversely, students with low self-efficacy need a high level of support from instructors or tutors to compensate for their deficiency (SAWANG, NEWTON and JAMIESON, 2013). In view of the above, the following hypotheses are proposed:

H1a. High self-efficacy has a positive effect on Perceived Ease of Use.

H1b. High self-efficacy has a positive effect on Perceived Usefulness.

### 2.2.2 Perceived Ease of Use

Perceived Ease of Use is understood as the degree to which a person believes that the use of a specific system is effortless. In other words, it is the degree of accessibility to information, flexibility, ease of use and clear interaction with the technological system, generating contributions to the teaching and learning process through the optimization of study times (DAVIS, 1989). Therefore, users tend to use the technology if they believe that the technology provided is easy to use (SANCHEZ-FRANCO, 2010). Many studies found evidence of a significant effect of Perceived Ease of Use on Attitude towards the Use of BL and Perceived Usefulness (DAVIS, BAGOZZI and WARSHAW, 1989; TERZIS and ECONOMIDES, 2011; LUST, ELEN and CLAREBOUT, 2012; ABDULLAH and WARD, 2016; SABAH, 2016). Consequently, the following hypotheses are proposed:

- H2a. Perceived Ease of Use has a positive effect on Attitude towards the Use of BL.
- H2b. Perceived Ease of Use has a positive effect on Perceived Usefulness.

### 2.2.3 Perceived Usefulness

Davis (1989) defined Perceived Usefulness as the degree to which a person believes that the use of a specific system would improve his performance at work. Perceived Usefulness is the most significant factor affecting the acceptance rate of an information system in which students perceive effectiveness as the system improving their study performance, efficiency, learning quality and collaboration between instructors (teachers and tutors) and colleagues (ABDULLAH and WARD, 2016; BALAKRISHNAN and GAN, 2016; SABAH, 2016). Positive attitude and satisfaction towards the Use of BL (DAVIS, 1989; LUST, ELEN and CLAREBOUT, 2012; ABDULLAH and WARD, 2016; IFINEDO, 2018), and Perceived Satisfaction (BHATTACHERJEE, 2001; LIAO, CHEN and YEN, 2007; LIN and WANG, 2012; KIM and LEE, 2014; JOO, PARK and SHIN, 2017), becomes substantially stronger if performance is improved after using the system. In addition, Perceived Usefulness should have a significant influence not only on the pre-adoption of users, but also on the post-adoption of the users' service / system (BHATTACHERJEE, 2001; LIAO, CHEN and YEN, 2007; LUST, ELEN and CLAREBOUT, 2012; LIN and WANG, 2012; JOO, PARK and SHIN, 2017). This is because Perceived Usefulness is an autonomous form of extrinsic motivation (identified regulation), which has a strong effect on uninteresting activities, in which only identified regulation predicts real behavior and behavioral involvement in uninteresting activities (GAGNÉ and DECI, 2005). Students' reactions to BL formats may depend on the quality of online materials and on the content and the effectiveness with which they are integrated into the course (GRIFFITHS; MULHERN; SPIES, 2015). In the context of this study, Perceived Usefulness has an effect on Attitude towards the Use of BL and Perceived Satisfaction. Thus, the following hypotheses are proposed:

- H3a. Perceived Usefulness has a positive effect on Attitude towards the Use of BL Use.
- H3b. Perceived Usefulness has a positive effect on Perceived Satisfaction.

### 2.2.4 Subjective Norms

Subjective norms are understood as the perception of the people most important to someone and if they think an individual should or should not perform the behavior in question (LIAO, CHEN and YEN, 2007). In this study, the Subjective Norms include the influences of instructors (teachers and tutors), colleagues, and people important to individuals within their social circle. Previous studies have found that Subjective Norms have a significant effect on Perceived Usefulness (ABDULLAH and WARD, 2016). In this context, the following hypothesis is proposed:

H4. Subjective Norms have a positive effect on Perceived Usefulness.

### 2.2.5 Controlled Motivation

Controlled motivation is a source of negative perception and internal / external pressure, which leads to maladaptive results (negative affect, perceived incompetence and dissatisfaction) in several domains (DECI and RYAN, 1985; WANG and HOU, 2015). Ryan and Deci (2000) identified two forms of Controlled Motivation, introjected and external regulation. Introjected regulation reflects the behavioral involvement of individuals in an activity for reasons originating within the individual and determined by the self-concept (obligation, guilt prevention, ego enhancement and internal rewards). External regulation reflects behavioral involvement in an activity for reasons located outside the individual, that is, determined by external sources (compliance, external rewards and avoiding punishment). The Self-Determination Theory (SDT) model considers that introjected regulation is more self-determined, while external regulation is the most controlled type of extrinsic motivation (RYAN and DECI, 2000). Motivated and controlled people tend to persist with behavior under external reinforcement, pressure and obligation. Thus, controlled motivation and Subjective Norms share some similarity with the opinion of others in forming motivation, influencing the individual's decision. Previous studies concluded that Controlled Motivation has a negative effect on Perceived Behavioral Control (ZHOU, 2016; LUQMAN, MASOOD and ALI, 2018), Attitude to Use (LUQMAN, MASOOD and ALI, 2018) and a positive effect on Subjective Standards (ZHOU, 2016). Therefore, the following hypotheses are proposed:

H5a. Controlled Motivation has a negative effect on Perceived Behavioral Control.

H5b. Controlled Motivation has a positive effect on the Subjective Norms.

H5c. Controlled Motivation has a negative effect on Attitude towards the Use of BL.

### 2.2.6 Autonomous Motivation

Autonomous Motivation is a central factor of the Self-Determination Theory (SDT) model, which is defined as the perceived origin or source of the behavior itself (DECI and RYAN, 1985; RYAN and CONNELL, 1989). Wang and Hou (2015) insisted that Autonomous Motivation is more influential than Controlled Motivation to induce specific behavior as Autonomous Motivation is associated with positive results, while Controlled Motivation is associated with negative results. Autonomously motivated people are more likely to persist with behavior without external reinforcement; this leads to adaptive results

(positive affect, perceived competence and satisfaction). Previous studies concluded that Autonomous Motivation has a positive effect on Perceived Ease of Use (NIKOU and ECONOMIDES, 2017), Perceived Behavioral Control (CHEON *et al.*, 2012; HAGGER and CHATZISARANTIS, 2016; ZHOU, 2016; RAZA *et al.*, 2017), Attitude towards the Use of BL (HAGGER and CHATZISARANTIS, 2016; ZHOU, 2016), Perceived Usefulness (ROCA and GAGNÉ, 2008; NIKOU and ECONOMIDES, 2017) and Subjective Norms (HAGGER and CHATZISARANTIS, 2016; ZHOU, 2016). Therefore, the following hypotheses are proposed:

- H6a. Autonomous Motivation has a positive effect on Perceived Behavioral Control.
- H6b. Autonomous Motivation has a positive effect on Subjective Norms.
- H6c. Autonomous Motivation has a positive effect on Attitude towards the Use of BL.
- H6d. Autonomous Motivation has a positive effect on Perceived Usefulness.
- H6e. Autonomous Motivation has a positive effect on Perceived Ease of Use.

### 2.2.7 Perceived Behavioral Control

Ajzen (1991) defined Perceived Behavioral Control as individuals' perception of the ease or difficulty of performing the behavior of interest. Perceived Behavioral Control includes external factors (availability of relevant resources, such as: documentation, facilities, personnel support, easy access and adequate time) and internal factors (ease / difficulty of performing a behavior based on the user's previous experiences, knowledge, skills and intelligence). Previous studies concluded that Perceived Behavioral Control has an impact on the individual's perception of control, which, in turn, affects the user's behavior and the actual use of the system (CHEON *et al.*, 2012; RAZA *et al.*, 2017). Perceived Behavioral Control increases as individuals perceive more confidence in their ability to perform the type of behavior in question (AJZEN, 1985; LIAO, CHEN and YEN, 2007; ZHOU, 2016). Thus, the following hypothesis is proposed:

- H7. Perceived Behavioral Control has a positive effect on Perceived Satisfaction.

### 2.2.8 Blended Learning Characteristics

The BL resources, according to Chart 1, are conceptualized as a single second-order construct composed of four first-order constructions.

**Chart 1.** Main characteristics of the Blended Learning system

Factor	Operational Definition	Author
Perceived flexibility	One of the factors of success and benefits, in addition to a notable resource for VLE platforms.	Graham and Dziuban (2008)  Jackson (2017)
Collaborative learning	The environment increases the students' intrinsic motivation and facilitates the process of sharing knowledge and experience through communication between the students themselves, student-instructors (teachers or tutors) and content available for class.	Karaarslan, Sungur and Ertepinar (2014)
Learning methodology	The systematic procedure instituted to establish courses with a clear scope and structure, definition of workloads, evaluation of learning activities and teaching support assistance. If the methodology adopted is generic enough and can be applied in several different disciplines, students' needs, and preferences can be met.	Dziuban, Hartman and Moskal (2004)
Self-regulated Learning	The intentional and strategic adaptations of learning activities can alter the results of cognition, motivation and behavior. Thus, the design features of the Blended Learning environment promote students' self-regulatory behavior, in which VLE tools can be customized to meet the educational needs of the courses (examples: web-based peer review and support feedback in the collaborative environment). They improve the cognitive perception of Self-Regulated Learning and initiate positive motivational beliefs.	Nicol and Macfarlane-Dick (2006)  Winne and Hadwin (2010)  Van Laer and Elen (2017)

Source: own elaboration.

The Blended Learning approach facilitates effective interactions (for example, group discussion, peer discussion, online chat and review of important lectures), leading to greater involvement in the learning process, satisfaction (NEGASH, RYAN and IGBARIA, 2003) and identification among students (PRINCE, 2004; BALAKRISHNAN and GAN, 2016). In view of this, it is expected that university students are autonomously involved in the learning environment when they have more confidence in their ability to manage the learning process. In this context, the following hypotheses are proposed:

- H8a. BL characteristics have a positive effect on the Subjective Norms.
- H8b. BL characteristics have a positive effect on Controlled Motivation.
- H8c. BL characteristics have a positive effect on Autonomous Motivation.
- H8d. BL characteristics have a positive effect on Perceived Behavioral Control.
- H8e. BL characteristics have a positive effect on Perceived Satisfaction.
- H8f. BL characteristics have a positive effect on Perceived Ease of Use.
- H8g. BL characteristics have a positive effect on Self-efficacy.
- H8h. BL characteristics have a positive effect on Perceived Usefulness.
- H8i. BL characteristics have a positive effect on the Attitude towards the Use of BL.

### 2.2.9 Perceived Satisfaction

Perceived Satisfaction can be understood as the condition of adopting an affective attitude towards a given system. In general, Perceived Satisfaction is an assessment of the emotion associated with an affective attitude towards a system. Therefore, a user may have a positive attitude towards a system, but still feel dissatisfied after using the system due to low expectations (KIM and LEE, 2014; JOO, PARK and SHIN, 2017; IFINEDO, 2018). In addition, the continued use of the BL approach by users is predominantly determined by their satisfaction with previous use.

### 2.2.10 Attitude Towards the Use of BL

Attitude towards Use can be understood as an emotion (for example, pleasure / gratification or frustration). In pre-adoption, it is a function of expectations and is based on cognitive beliefs (for example, Perceived Usefulness and Perceived Ease of Use) formed from other opinions. In post-adoption, it is a function composed of previous attitude and perception of satisfaction, which is formed based on your own experience with the system (for example, satisfaction and fun). Therefore, the attitude towards the use of user's post-adoption is more stable, realistic and invulnerable to changes than users' pre-adoption. Thus, this construct can become highly relevant when influencing users' behavior (AJZEN, 2002; CHEON *et al.*, 2012; ABDULLAH and Ward, 2016; RAZA *et al.*, 2017).

## 3 Method

The approach of this research was quantitative. In the data collection, the research instrument was an online questionnaire with closed questions. Two management academics were consulted to refine the questionnaire and validate the adaptation of the research instrument to the Brazilian context. Based on their feedback, some items were reformulated.

The method of data collection was convenience sampling, a non-probabilistic technique, a fact that limits the generalization of research results. To measure each item of the constructs, the Likert scale was used with end points anchored in "totally disagree" (1) and "totally agree" (5) for all 57 statements. For aspects of the characterization of the demographic profile and organizations, specific objective questions were elaborated.

The questionnaire was made available through the QuestionPro research management software to facilitate access to students. 870 students were approached to participate in the research, however, a total of 532 valid questionnaires were obtained after data purification. These were tabulated in Microsoft Excel and subsequently analyzed in IBM SPSS and SmartPLS.

## 4 Analysis of Results

### 4.1 Analysis Unit

BL can be established at four different organizational levels: at the activity level, at the course level, at the program level and at the institutional level. In the case of this study, the research focused on courses.

This study was performed in a private higher education institution that, supported by Ordinance no. 1,428, from December 2018, adopted as a teaching strategy to offer, at first, 20% and then 40% of the subjects as distance courses.

### 4.2 Characterization of Respondents

In this subsection, the characterization of the sample that served as a basis for the analysis of the Blended Learning phenomenon in the training of students in management courses at a private university will be presented. In Table 1, presented below, information about sex, age and education level is detailed.

**Table 1.** Profile of respondents

		n	%
<b>Sex</b>	Female	304	57.1
	Male	228	42.9
<b>Age</b>	up to 20 years	119	22.4
	from 21 to 30 years	355	66.7
	from 31 to 40 years	46	8.6
	over 41 years	12	2.3
<b>Course</b>	Administration	<b>458</b>	<b>86.1</b>
	- <i>beginner group</i>	106	80.3
	- <i>concluding group</i>	352	19.7
	Marketing Technology	<b>74</b>	<b>13.9</b>
	- <i>beginner group</i>	26	19.7
	- <i>concluding group</i>	48	12.0
<b>Total</b>		<b>532</b>	<b>100.0</b>

Source: own elaboration.

The sample showed a prevalence of females in all age groups, with a greater concentration between 21 and 30 years (57.7%, n=205). In addition, when we observe the courses separately, we find that it is females that have the largest participation in the sample in the case of the Administration course with 60%, whereas in Marketing Technology the predominance is male with 60.8%.

The data of the research participants related to the current semester were divided into two groups (beginners and graduates). Starting from this grouping, when analyzing the average of the intensity variable of liking the subjects in the VLE, it was found that the group of beginners tends to like the VLE more than the concluding group ( $t_{(530)}=3.625$ ;  $p<.001$ ). The same intergroup analysis was performed with the variable level of technical domain of the VLE, but there was no significant difference between the means of the groups (beginners and graduates) with the test ( $t_{(530)}=.546$ ;  $p=.585$ ).

Respondents, when grouped by frequency of use of VLE, displayed greater weekly access (49.1%, n=261), among which it is noticed that the majority belong to the high intensity group (69%, n=180). Alternatively, the one with the lowest frequency was the monthly one (15.2%, n=81) indicating a predominance in the low intensity group (58%, n=47).

Only 120 of the 532 respondents reported that they had previous experience with distance learning, most of which concentrated on courses of up to 20 hours (29.2% representing free or extension courses and professional training) and, above 81 hours (27% representing undergraduate or language courses).

Pearson's bivariate correlation showed that there is a positive correlation between VLE's technical domain and Intensity to like disciplines in VLE ( $\rho=.396$ ;  $p<.001$ ). From this analysis, it was decided to separate these variables by groups (high and low).

The group that had no experience with distance education before entering the studied university was more interested in the subjects offered in the VLE, which was reflected in a longer time dedicated to activities on the platform ( $t_{(373.914)}=2.103$ ;  $p<.05$ ). The same was not observed in the group that had previous experience with distance learning ( $t_{(118)}=1.024$ ;  $p=.308$ ). The average time of dedication of students from both courses and those who had previous experience with distance education and those who did not, was up to 20 hours per month (88.9%).

#### 4.3 Analysis of the Structural Model

The normality of the data was verified by the Kolmogorov-Smirnov test (K-S) and the respective p-value of each variable. This procedure was necessary to limit the possibility of using some statistical analysis techniques that have the normal distribution of data as a characteristic. All Z-values and individual p-values of the K-S test for the indicators were "very significant" with  $p <.001$  (HAIR *et al.*, 2014). With regard to the predictor variables

related to the latent variable “Attitude towards the Use of BL”, it was possible to accommodate multicollinearity in the model - all values of the Variance Inflation Factors (VIFs) were below 5, with the lowest, PBC02=1,316, and the largest, PU04=2,228.

After the first interaction, the results of the factor loadings obtained by the variables were presented and it was possible to verify that all variables had factor loads greater than .5. Then, the convergent validity was verified, which demonstrates the extent to which the latent variable correlates with the items chosen to measure that variable and the discriminant validity that involves the correlation between the constructs of the theoretical model. It was necessary to exclude some variables to accommodate the discriminant validity with the Fornell-Larcker criterion (excluded variables: SE03, PEU01, PU05, PS03, PBC04, AM02, AM03, LM04 and SRL03).

The next step was to examine the measurement model, which involved: Cronbach’s Alpha, Composite Reliability, Average Variance Extracted, determination coefficients ( $R^2$ ), predictive relevance ( $Q^2$ ), effect size ( $f^2$ ) and the GoF (HAIR *et al.*, 2014) according to Table 2:

Table 2. Convergent validity

Construct	Cronbach's Alpha (CA)	Composite Reliability (CR)	Average Variance Extracted (AVE)	R <sup>2</sup>	f <sup>2</sup>	Q <sup>2</sup>	Number of items
	>.7	>.7	>.5				
Self-regulated Learning	.752	.858	.669	.819	4.527	.541	3
Collaborative Learning	.765	.850	.587	.750	3.006	.432	4
Attitude towards the Use of BL	.791	.877	.705	.777	.079	.539	3
Self-efficacy	.793	.879	.707	.635	1.740	.442	3
Perceived Behavioral Control	.692	.829	.618	.602	.331	.365	3
Perceived Ease of Use	.857	.904	.701	.766	.294	.530	4
Perceived Flexibility	.791	.864	.614	.790	3.771	.476	4
Learning Methodology	.807	.886	.722	.783	3.603	.558	3
Autonomous Motivation	.836	.901	.753	.695	2.277	.519	3
Controlled Motivation	.777	.854	.595	.190	.234	.104	4
Subjective Norms	.700	.816	.525	.564	.161	.286	4
Perceived Satisfaction	.830	.898	.746	.755	.299	.557	3
Perceived Usefulness	.860	.905	.704	.743	.199	.510	4

Source: own elaboration.

Cronbach's Alpha coefficients ranged between 0.692 and 0.860. These results indicated high internal consistency of the scales used (HELMS, 1999).

Composite Reliability is the degree to which a set of latent variable indicators is consistent in its measurements. The Composite Reliability obtained in this study ranged between 0.816 and 0.905 indicating that the results were satisfactory in this regard (HAIR *et al.*, 2010).

For this model, the Average Variance Extracted ranged between .587 and .753. In this sense, all latent variables showed an Average Variance Extracted greater than 50%, which reaches the criteria of Chin (1998) for the indication of the existence of convergent validity.

The  $R^2$  value measures the predictive accuracy of the model, representing the combined effects of endogenous variables on exogenous variables. In the present study, the  $R^2$  value demonstrated that the model has accuracy and predictive relevance in all constructs.

Cohen's  $f^2$  is used to estimate the effect size in correlated samples (repeated measures, longitudinal data, grouped data) for two continuous variables. It is evaluated how much each construct is "useful" to adjust the model. Values of .02, .15 and .35 are considered small, medium and large, respectively (HAIR *et al.*, 2014). The  $f^2$  values are obtained by reading the communalities. What is perceived in this research is that the vast majority were considered medium and large, with the exception of the constructs: "Subjective Norms", "Perceived Usefulness" and "Attitude towards the Use of BL".

$Q^2$  evaluates how close the model is to what was expected of it (or the quality of the model's prediction or the accuracy of the adjusted model). According to the criterion used to assess the accuracy of the adjusted model,  $Q^2$ , all constructs were considered to have adequate accuracy, as they had values greater than zero (HAIR *et al.*, 2014).

Goodness of Fit (GoF) is the global adjustment measure, which is the square root of the multiplication of both AVE and  $R^2$  means of endogenous variables. In the case of this research, the value found for GoF was .684 (67.4%), considered large enough for the validity of the model in PLS (WETZELS, ODEKERKEN-SCHRÖDER and VAN OPPEN, 2009).

The discriminant validity evaluated the items that reflect the factor or which are correlated with other factors. In this research, the Average Variances Extracted were greater than or equal to the square of the correlation between the factors, as shown in Table 3, with the definitive Fornell-Larcker criterion with all the factor loads of each indicator with values above .5. It was not necessary to exclude variables to adjust the model.

**Table 3:** Discriminant validity

Construct	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
<b>(1) Self-regulated Learning</b>	<b>.818</b>												
<b>(2) Collaborative Learning</b>	.712	<b>.766</b>											
<b>(3) Attitude towards the Use of BL</b>	.784	.745	<b>.839</b>										
<b>(4) Self-efficacy</b>	.730	.666	.711	<b>.841</b>									
<b>(5) Perceived Behavioral Control</b>	.681	.581	.661	.729	<b>.786</b>								
<b>(6) Perceived Ease of Use</b>	.761	.681	.808	.770	.771	<b>.837</b>							
<b>(7) Perceived Flexibility</b>	.771	.668	.704	.685	.703	.767	<b>.783</b>						
<b>(8) Learning Methodology</b>	.746	.694	.780	.748	.725	.822	.703	<b>.849</b>					
<b>(9) Autonomous Motivation</b>	.752	.722	.813	.780	.682	.803	.670	.820	<b>.868</b>				
<b>(10) Controlled Motivation</b>	.356	.541	.408	.313	.220	.293	.273	.382	.411	<b>.771</b>			
<b>(11) Subjective Norms</b>	.617	.667	.632	.641	.550	.626	.540	.624	.648	.549	<b>.725</b>		
<b>(12) Perceived Satisfaction</b>	.768	.744	.778	.778	.701	.818	.731	.802	.854	.368	.629	<b>.864</b>	
<b>(13) Perceived Usefulness</b>	.749	.755	.794	.686	.635	.768	.719	.740	.807	.390	.573	.783	<b>.839</b>

Source: own elaboration.  
 Note: the highlighted diagonal shows the square roots of the AVE.

In the practical application of the structural equation modeling for the Proposed Theoretical Model - Figure 1, the approach suggests the evaluation of the measurement models individually, seeking to verify their validity and consistency and, then, performing the structural model approach. From a sample, other samples composed of elements from the original sample (bootstrapping with n=532) were developed and the model parameters are estimated according to Table 4 (CHIN, 1998).

**Table 4:** Paths and hypotheses

	Original sample ( $\beta$ )	Bootstrapping (n=532)	Standard error	t-value	p-value
<b><i>Research hypotheses – direct relationships</i></b>					
H1a. Self-efficacy -> Perceived Ease of Use	.170	.165	.060	2.837	.005
H1b. Self-efficacy -> Perceived Usefulness	-.077	-.078	.050	1.532	.126
H2a. Perceived Ease of Use -> Attitude towards the Use of BL	.218	.216	.058	3.729	.000
H2b. Perceived Ease of Use -> Perceived Usefulness	.110	.111	.061	1.799	.073
H3a. Perceived Usefulness -> Attitude towards the Use of BL	.160	.161	.052	3.057	.002
H3b. Perceived Usefulness -> Perceived Satisfaction	.220	.222	.051	4.353	.000
H4. Subjective Norms -> Perceived Usefulness	-.052	-.049	.031	1.669	.096
H5a. Controlled Motivation -> Perceived Behavioral Control	-.147	-.147	.035	4.235	.000
H5b. Controlled Motivation -> Subjective Norms	.296	.295	.044	6.691	.000
H5c. Controlled Motivation -> Attitude towards the Use of BL	-.050	-.049	.025	1.982	.048
H6a. Autonomous Motivation -> Perceived Behavioral Control	.186	.184	.071	2.630	.009
H6b. Autonomous Motivation -> Subjective Norms	.190	.192	.077	2.461	.014
H6c. Autonomous Motivation -> Attitude towards the Use of BL	.217	.218	.052	4.162	.000
H6d. Autonomous Motivation -> Perceived Usefulness	.371	.367	.060	6.204	.000
H6e. Autonomous Motivation -> Perceived Ease of Use	.234	.237	.060	3.900	.000
H7. Perceived Behavioral Control -> Perceived Satisfaction	.118	.119	.042	2.811	.005

H8a. BL Characteristics -> Subjective Norms	.404	.401	.069	5.821	.000
H8b. BL Characteristics -> Controlled Motivation	.436	.438	.046	9.541	.000
H8c. BL Characteristics -> Autonomous Motivation	.834	.834	.017	47.779	.000
H8d. BL Characteristics -> Perceived Behavioral Control	.668	.670	.067	9.906	.000
H8e. BL Characteristics -> Perceived Satisfaction	.583	.581	.056	10.491	.000
H8f. BL Characteristics -> Perceived Ease of Use	.524	.526	.057	9.162	.000
H8g. BL Characteristics -> Self-efficacy	.797	.797	.022	37.046	.000
H8h. BL Characteristics -> Perceived Usefulness	.529	.532	.063	8.393	.000
H8i. BL Characteristics -> Attitude towards the Use of BL	.326	.327	.059	5.537	.000

***BL Characteristics - operational definitions***

BL Characteristics -> Perceived Flexibility	.889	.890	.011	78.224	.000
BL Characteristics -> Learning Methodology	.885	.885	.013	66.952	.000
BL Characteristics -> Colaborative Learning	.866	.867	.015	59.258	.000
BL Characteristics -> Self-regulated Learning	.905	.905	.009	97.115	.000

Source: own elaboration.

The results of the significance analysis of the paths indicated that most of the hypotheses did not obtain a significant difference between the original sample and the subsamples generated by the statistical technique with the critical limits for the Student t-test. This test showed that the coefficients of the correlation/regression analysis were equal to zero (HAIR *et al.*, 2010). The values for Student's t-test with p values that were considered statistically significant for  $p < .05$  and  $t = 1.96$ . Therefore, the analysis of each of the paths related to the respective research hypotheses follows:

Of the 25 hypotheses formulated, only 3 were not supported in this research (H1b, H2b and H4). All of these hypotheses had in common the “Perceived Usefulness” construct as a response variable in the relationship path. H1b ( $p=.126$ ) showed that Self-efficacy has no effect in relation to Perceived Usefulness, and this can be explained in part by the profile of the student participating in the research. The students work to pay for their studies and have little time to access the VLE and perform online activities in advance. Another aspect to be noted is that part of the group started studies in a hybrid format and part migrated during the course, demanding a greater or lesser level of support from the body of teachers and tutors (BALAKRISHNAN and GAN, 2016).

The same phenomenon was observed in H2b ( $p=.073$ ), where the Perceived Ease of Use had no effect on the Perceived Usefulness. This reinforces that for students, the facilities present in the use of the VLE used by the university do not generate noticeable contributions to the teaching and learning process, considering that the use of the environment is not mandatory and also does not interfere in the composition of the grade in the disciplines (TERZIS and ECONOMIDES, 2011; ABDULLAH and WARD 2016; SABAH, 2016).

In relation to H4 ( $p=.096$ ), it was found that the Subjective Norms also have no effect on Perceived Usefulness. The performance of online activities are not mandatory, that is, access is at the discretion of each student, and it is up to the teacher only to indicate the importance of access to materials before classes, as well as showing by the use of active methodologies the importance of doing so. Additionally, the tutors are available to help them when required and to stimulate awareness of the importance, and, finally, to course colleagues to recognize the importance of online discussions for the learning process (ABDULLAH and WARD, 2016; BOWYER; CHAMBERS, 2017).

In the context of Blended Learning, Perceived Usefulness can be understood as the degree to which the individual believes that using a technological system increases their performance. Perceived Usefulness can also be associated with an individual's perception of reproducing behavior to gain specific rewards.

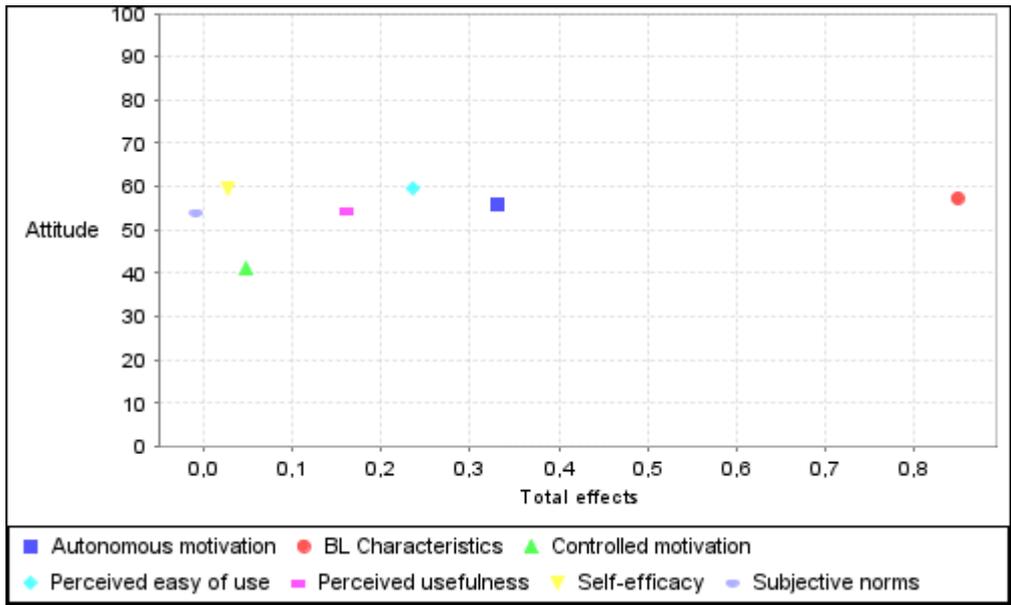
In general, it was found that, among the accepted hypotheses, the largest  $\beta$  were present in the hypothesis's responses to Blended Learning, all of which presented  $p<.001$ . The H8c with the path “BL characteristics  $\rightarrow$  Autonomous motivation” was the one with the highest  $\beta$  (.834), maintaining that autonomous motivation is associated with positive results that are obtained from the moment the student sees himself as the protagonist of their learning process (DECI and RYAN, 1985; RYAN and CONNELL, 1989). In this context, the characteristics of BL act as an enhancer of this behavior, since, for example, the more it is exposed to a self-regulated environment, as is the case of the VLE used by the University, it can follow personalized paths. This is essential as they encounter some kind of difficulty in its knowledge construction process, as is the case with leveling programs that allow recovering high school content (whose performance level can be reversed in hours of complementary activities or in extra points in current subjects semester) or the English course (which may result in participation in the exchange program at a university in the United States), all in a gamified environment that gives prestige to playfulness to make the learning process more attractive.

Likewise, the H8d with the path “BL Characteristics → Self-efficacy” had the second highest  $\beta$  (.797) verifying that people with high Self-efficacy tend to have a higher level of self-confidence in their abilities and abilities to perform tasks (BALAKRISHNAN and GAN, 2016). In all disciplines and semesters of the course, active methodologies are adopted and, also, the classrooms are equipped with computers and multimedia kits to facilitate the teaching and learning process, which makes this student, when making contact with this format systematically, tend to feel more confident.

In addition, the H8g with the path “Characteristics of BL → Perceived Behavioral Control” obtained the third largest  $\beta$  (.668) and may indicate, from the point of view of external factors, that students recognize the facilities that the VLE used by the University leads to ease of access, quality of technical and pedagogical support, sufficient time for the development of activities, etc. Regarding internal factors, 122 of the 532 students had previous experiences in distance or hybrid courses (AJZEN, 1991), which would make it easier to use the VLE used by the university in question.

The results can be corroborated by Graph 1, which relates the total effects (importance) with the performance (average scores on a scale of 0 to 100), according to Bido and Silva (2019). Here it is clear that the second order construct “Blended Learning” has the main effect of importance in relation to promoting “Attitude” with performance=65.883.

Graph 1. Performance-importance map (or priority map)

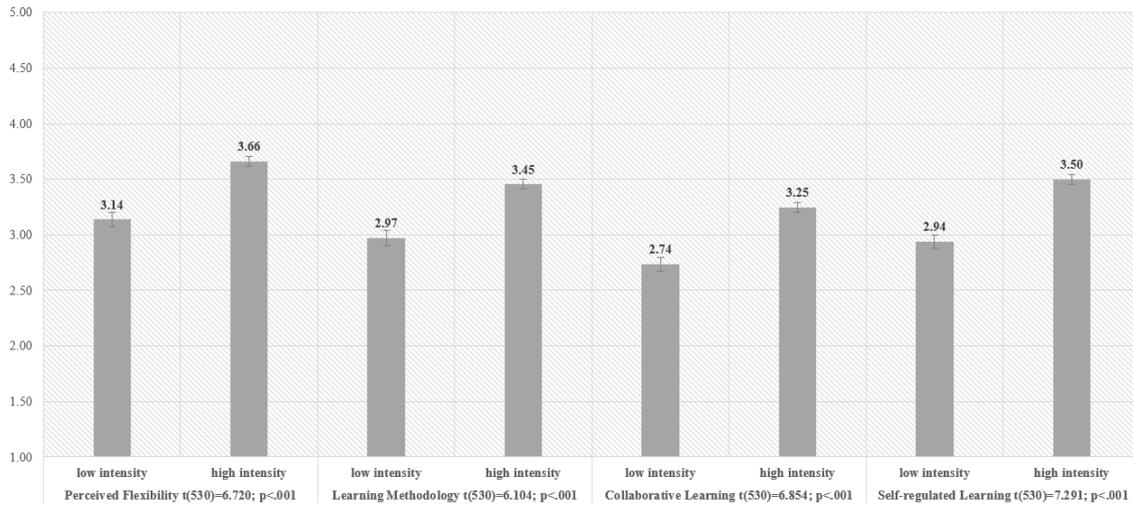


Source: own elaboration.

For both “male” and “female” groups, there was no difference in the means when analyzing the t-tests (all  $p > .05$ ) for the first order constructs of Blended Learning (Perceived Flexibility, Learning Methodology, Collaborative Learning and Self-regulated Learning). This effect was the same when the “beginner” and “concluding” groups were analyzed. However, there was a slightly higher average for the “beginner” group, leading to the understanding that the beginner group may show greater motivation in the activities of the VLE at the beginning of the course.

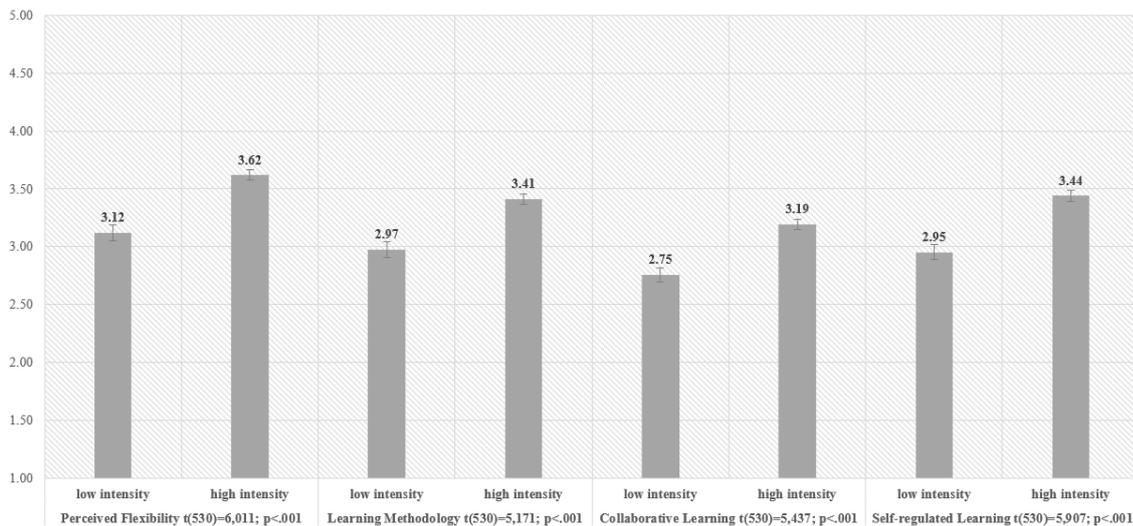
When analyzing the intergroup average of the intensity of liking the subjects in the VLE (low and high intensity) in relation to the constructs that form Blended Learning, it was found that in all cases there was a significant difference between the averages, prevailing “high intensity” ( $p < .001$ ). This indicates that students who have demonstrated “high intensity” in liking VLE have greater facility in perceiving the characteristics of Blended Learning (see Graph 2). This effect, as observed in Graph 3, also occurred in the intergroup average of the technical domain of the VLE (low and high domain).

**Graph 2.** Intensity of linking AVA in the BL forming factors



Source: own elaboration.

**Graph 3.** Technical domain of VLE in BL forming factors



Source: own elaboration.

When analyzing the correlation of the constructs that form Blended Learning, it was found that all had a positive influence, but the “perceived flexibility” with “self-regulated learning” was the correlation that brought the highest value of  $\rho=0.765$ ;  $p<0.001$ . This indicates that flexibility in accessing VLE, both on mobile devices and on computers, to enable the Blended Learning approach favors the students’ ability to manage their projects, their progress, their strategies regarding the tasks to be performed and also of the possibility of difficulties that may arise. Self-regulation is also related to the students’ ability to direct their feelings and planned actions towards the acquisition of personal goals and objectives. Therefore, it is up to the students to adapt cyclically to the process when changes occur in the course of conducting the learning process.

However, this strong correlation between “perceived flexibility” and “self-regulated learning” indicates that the greater the access to information and content that stimulates students, the more likely they are to continue to develop an action plan focused on the task, selecting materials and other resources and, therefore, successful completion of the proposed activities. However, instructors (tutors, teachers and coordinators) must be attentive in relation to the evaluation of the results, comparing the results achieved with those intended, so that it is possible to verify the extent to which students’ feelings of frustration or success may interfere in Blended Learning.

## 5 Final Considerations

The literature review shows that Blended Learning is possible to expand the positive points of classroom teaching (mainly the mediation “of the other” in the learning and construction of knowledge of each university student, in addition to the feeling of belonging to a group) and incorporate distance learning. Distance education respects the time and learning style of each individual student, as well as the use of other forms of mediation made possible by the new Digital Information and Communication Technologies (DICTs).

The objective of the article was achieved by presenting a model with the factors that influence and stimulate university students in relation to the attitude towards the use of the Blended Learning approach. In addition, this research verified the main characteristics of Blended Learning in the light of the “intensity of liking” and the “technical mastery” of the VLE by university students. Students who demonstrated “high intensity” in liking the VLE also have greater facility in perceiving the characteristics of Blended Learning and this effect also occurred in the intergroup average of the technical domain of VLE (low and high domain).

The VLE of the HEI studied is based on the concept of flipped classroom or “inverted classroom”, in which the most basic levels of learning occur through individualized study, allowing collaborative activities (face-to-face or distance) to be organized with the student. The objective of this method is to create new knowledge through discussion, and applying knowledge in new problem situations, which require the critical and creative use of the studied contents.

However, the conception of the model and its description in the pedagogical projects of the course, although complex, does not, in itself, guarantee the implementation of the proposal. Therefore, the Blended Learning proposal will only be implemented in the daily practice of tutors, teachers, coordinators, students, among other participants in this process.

That is why it is essential to involve teachers, tutors, and student representatives in planning activities that will be included in educational projects. It is also essential that the HEI management understand and support the proposal, without which it will not be able to effectively consolidate itself. Thus, this study allows a brief reflection, contributing to the advancement of discussions about the attitude towards the use of BL by the university student in a teaching structure that favors critical thinking.

Finally, Blended Learning has become an evolutionary, responsive and dynamic process that, in many ways, is organic, challenging all attempts at universal definition due to its flexibility to allow HEIs and collaborative groups to adapt the concept to maximize its potential while responding to a new generation of college students. This type of learning can increase access within the scope of existing resources, while maintaining or improving quality. This approach has the potential to promote a more reflective attitude among students, through a learning process that goes beyond the limits of traditional classrooms. Therefore, the strategy of adopting Blended Learning is much more than a multiplication of channels, it is a combination of teaching and learning methods that allow to prepare the student to face the demands of the job market through practical skills.

As a suggestion for future research, it is observed that the construct Anxiety of the original model of Sabah (2019) could be used in a future study also involving other constructs such as: depression, stress, loneliness, among other psychological factors that may affect adoption of BL.

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