

Social Influence in Remote Classroom Platform: Professors' Point of View

Influência Social na Plataforma de Aula Remota: Ponto de Vista dos Professores

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Abstract

The main goal of this research is to analyze how social influence can act as an antecedent in relation to the expectation and perception of professors regarding the adoption and intention to continue use of digital platforms for remote classes. The study has a quantitative approach testing a conceptual model proposal, based on constructs behavioral, using the technique of modelling structural equations by partial least squares (PLS-SEM). The results pointed to a significant effect of social influence on professors' expectations regarding the effort and performance to manage the online class platforms with a positive perception about the support promoted by the faculties. This demonstrates that the physical distancing caused by the pandemic has resulted in a virtual social proximity, based on the need for more frequent use of digital communication technologies. This study demonstrates the dynamism of behavioural relationships and the importance of social relations in the process of technological acceptance, instigating new studies and contributing to empirical studies of current themes. The model was validated by survey with Brazilian professors from north region (mainly Amazon region). The results demonstrate that technological acceptance can be facilitated when the body of professors has, in their peers, references that inspire learning. The study social proved the relevance of social influence in the scenario of restrictions regarding face-to-face social interaction.

Keywords: Continuity of use. Model UTAUT. Previous experience. Social influence.



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Resumo

O objetivo principal desta pesquisa é analisar como a influência social pode atuar como antecedente em relação à expectativa e à percepção dos professores quanto à adoção e à intenção de continuar o uso de plataformas digitais para aulas remotas. O estudo tem abordagem quantitativa, testando uma proposta de modelo conceitual, baseado em construtos comportamentais, utilizando a técnica de modelagem de equações estruturais por mínimos quadrados parciais (PLS-SEM). Os resultados apontaram para um efeito significativo da influência social nas expectativas dos professores quanto ao esforço e ao desempenho na gestão das plataformas de aulas online, com uma percepção positiva sobre o apoio promovido pelas faculdades. Isto demonstra que o distanciamento físico provocado pela pandemia resultou numa proximidade social virtual, baseada na necessidade de utilização mais frequente das tecnologias de comunicação digital. Este estudo demonstra o dinamismo das relações comportamentais e a importância das relações sociais no processo de aceitação tecnológica, instigando novos estudos e contribuindo para estudos empíricos de temas atuais. O modelo foi validado por pesquisa com professores brasileiros da região Norte (principalmente região Amazônica). Os resultados demonstram que a aceitação tecnológica pode ser facilitada quando o corpo docente tem, em seus pares, referências que inspiram a aprendizagem. O estudo social comprovou a relevância da influência social no cenário de restrições quanto ao convívio social presencial.

Palavras-chave: Continuidade de uso. Modelo UTAUT. Experiência anterior. Influência social.

1. Introdução

In the education sector because of social distancing instead of in-person courses they have adopted remotely synchronized courses also known as e-courses using new learning platforms (Tedeschi; Strauhs, 2021). The efficiency of this technology is achieved with connectivity and collaboration among its users (Santos Junior; Monteiro, 2020).

With regard to technological acceptance the Unified Theory of Acceptance and Use of Technology (UTAUT) model included factors of performance expectation, effort expectation, social influence and facilitation conditions, considering individual environmental and social factors perspectives (Sohn; Kwon, 2020) and in the educational context, the view of professors is understood as relevant (Zhang et al., 2022), being indispensable to contemplate issues related to the ability of the professor and factors of his formation to provide sufficient skills and experience in its application within its fields (Bruggeman et al., 2021).

Although several studies on technological acceptance and adoption have been addressed in educational settings (Williams et al., 2015), it is necessary to expand this range, especially on the acceptance of technologies by university professors in the context of the implementation of a new learning management system (Garone et al., 2019); particularly on the adoption process and continuous use of the remote classroom model.

In the context of the application of the UTAUT model technology users present psychological and social behaviors that demonstrate the existence of new intervening factors in the process of technological acceptance (Moodley et al., 2020), such as the level of anxiety (Donmez-Turan, 2020) and previous experience (Dindar et al., 2021) which influence various perceptions about the acceptance of new educational technologies (Kemp et al., 2019) and also the user satisfaction (Pillai et al., 2021). Those factors have been shown to be crucial factors in the process of accepting new technological models since the work of Davis (1989).

After COVID-19 scenario and considering changes caused by the pandemic adoption of new technologies and maintenance of remote classes, the research question is: How social influence affect the professors' perception of adoption and use of digital learning platform in faculty classes?

The objective of this research is to analyze how social influence can act as an antecedent in relation to the expectation and perception of professors regarding the adoption and intention to continue use of digital platforms for remote classes.

This research is justified by the need to analyze the effects of social influence as an antecedent construct of professors' perceptions as users of technology on the variables of performance and effort expectations in addition to facilitating conditions, as indicated by a study that focuses on students (Almaiah et al., 2019).

The study has a quantitative approach, testing a conceptual model proposal based on constructs from the behavioral and information management literature, using the technique of modelling structural equations by partial least squares (PLS-SEM) with the SmartPLS® (v 3.3.6.). The paper is organized in the introduction theoretical approach methodology results discussions and conclusion that points out limitations and recommendations for further studies followed by the list of references used.

2. Theoretical approaches

The UTAUT (Unified Theory of Acceptance and Use of Technology) is a model used to measure user acceptance operationalized as behavioral intent and actual or self-reported use created and tested by Venkatesh *et al.* (2003) that is widely used with a focus on the acceptance and adoption of technologies (Al-Saedi; Al-Emran, 2021).

2.1 Social influence

Social influence could be related to how individual perceives that other important people believe they should use the new system (Venkatesh et al., 2003). Therefore, it refers to the degree to which the individual believes that other individuals consider it relevant that the technology is used by him (Joa; Mag-samen-Conrad, 2022).

The social influence reflects the importance of the opinions of other individuals who exert influence on the individual as the intention to use the system because the pressure of people who are relevant references make there is a great possibility of this individual come to use the new technology seeking to be within the expectations placed on him (Garone *et al.*, 2019; Šumak *et al.*, 2010). Consideration of the opinion of an important person with expertise should be a relevant factor in the likelihood that an individual will use a new technology (Šumak *et al.*, 2010). From recent studies, one can still reflect on this influence in the educational context (Yee; Abdullah, 2021).

2.2 Intention to continue use

The intention to continue use refers to the degree of subjective possibility of a person to have a given behavior of use in a new technology (Fishbein; Ajzen, 1975) and refers to the idea of planning purpose use and the like (Warshaw; Davis, 1985; Venkatesch *et al.*, 2003).

Behavioral intention to continue use is concerned about the level of a person generates plans and behaves to stay in it for a period (Warshaw; Davis, 1985) and is determined by attitudes norms and the perception of control over a given conduct (Mubarokah; Hidayanto, 2020).

2.3 Satisfaction

Chiu *et al.* (2008) define satisfaction as a particular emotion of pleasure which results from the comparison of perceived performance in relation to the expectations created. Post-satisfaction being associated with a future intention. Liao *et al.* (2011) mentions that satisfaction with a product (service) is one of the main motivating elements for continued use.

There are studies that show that user satisfaction and behavioral intention of use are influenced by the degree of perceived performance (Burton *et al.*, 2003; Yan *et al.*, 2021) that is the behavioral intention of use is linked to the performance that the user will have in their technology experiences.

2.4 Previous experience

The previous experience in the use of the computer proves that the individual understands how to access and use this technology without a support. The user experienced in the use of computer must understand enough to use it regardless of specific support of software being the variable previous experience as an influencer of various technological perceptions (Potosky; Bobko, 1998; Tomczyk *et al.*, 2020) and very important in the first moment of the experience with this new technology.

In this sense the user will be able to make a comparison with their previous experiences regarding technology use as well as their beliefs of how easy and useful access can become in the use of technology (Burton; Roberts, 2003).

2.5 Facilitating Conditions

Facilitating conditions are defined by Venkatesh *et al.* (2003) as "the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system." Therefore, it starts from the premise that the individual assumes that the organization provides a technical infrastructure to support the use of the new technology and may or may not influence its use (Venkatesh *et al.*, 2003; Garone *et al.*, 2019; Zhou *et al.*, 2019). It is observed that these objective factors are considered external to the individual that is they are not intrinsic (Alwahaishi; Snásel, 2013) and therefore are constituted as facilitators to some extent or that can affect the occurrence of the intention to use the system (Jadil *et al.*, 2021).

Thus external factors that compromise the use of technology should have a support for the situation to be resolved because this variable may affect the behavioral intention to continue using. Facilitating conditions explain what future potential users need to know in order to adopt a new technology what resources will be provided or what help will be offered through the support they will need to properly use the technology (Kessler; Martin, 2019; Jadil *et al.*, 2021).

2.6 Expectation of effort

The expectation of effort can be defined as the “degree of ease associated with the use of new technologies” (Venkatesh *et al.*, 2003). Therefore, it refers to the amount of perceived effort that the user needs to apply to learn how to operate a system (Gupta *et al.*, 2020). This construct is related to how much an individual believes they will have to strive to learn about a particular technology. Research states that the more complex the technological innovation, the lower the rate of use (Maruping *et al.*, 2017).

Therefore, in relation to the expectation of effort, it is expected that this is more developed in the early stages of a new behavior when certain processes represent difficulties to be overcome and then become overshadowed by concerns with the instrumentality of the action to be produced (Sarosa, 2019). That is, users with difficulties in the use of systems are uncomfortable with the use of new technologies because the effort will be greater and may give up easily if they perceive some greater difficulty in accessing the new methodology.

2.7 Performance expectation

The expectation of performance refers to the degree of perception that the user believes that from the adoption of a new technology can corroborate with the achievement of a better performance in their activities at work (Venkatesh *et al.*, 2003) that is, it is the degree to which the user believes that by using the system it will enable better performance. Performance expectation is related to the relative advantage (Zhou *et al.*, 2010).

The expectation of performance can be understood as an individual cognition about the consequences arising from the use of technology being basically an extrinsic motivation that absorbs the relationships of the environment in which the user is inserted (Davis *et al.*, 1992). The acceptance and use of platforms within a technological model demonstrate that the greater the perceived relative advantage the greater the likelihood of continuous use of the new technology (Barrane *et al.*, 2018). The insertion of technology in the educational environment occurs due to structural or cultural issues (Nistor *et al.*, 2013) and its acceptance is also related with professors' performance expectations (Garone *et al.*, 2019).

2.8 Anxiety

Simonson *et al.* (1987) defines anxiety as the apprehension or even the fear of an individual when faced with the possibility of making use of computers that is relating directly to the general perceptions that the individual has regarding the use of the computer. Anxiety generates tension and nervousness according to Wu *et al.* (2019) because it has a negative influence being understood at the individual level as a negative affective reaction in relation to the use of technology (Venkatesh, 2000).

Research both about digital information and communication technologies (DICTs) and in psychology highlight the central role that the anxiety about computer use generates and demonstrate its characteristic as to be a variable linked to emotions. For example, anxiety has been shown to have a very significant impact on user attitudes (Igbaria; Parasuraman, 1989) on user behavior (Gupta *et al.*, 2020) on performance intention of use and learning (Donmez-Turan, 2020).

3. Proposed conceptual model

From the proposed model (Figure 1), social influence can act directly on professor's performance expectation and how much they perceive that the acceptance and use of technology can help them in their

self-performance through digital platforms (Donnelly *et al.*, 2011; Baroudi; Shaya, 2022). The performance expectation which refers to how useful this technology will be for the work of the professor was considered the most powerful tool in the intention of using new technologies (Venkatesh *et al.*, 2003). Thus, professors who confirm the usefulness in performance with digital platforms more quickly will accept and continue using these new technologies generating the following statement:

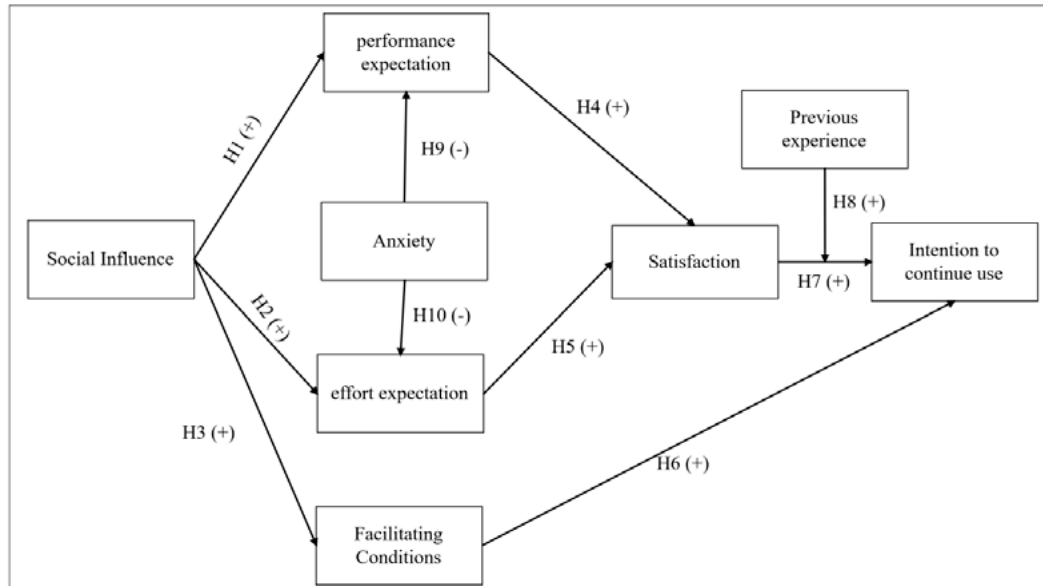


Figure 1: Proposed conceptual model
(Source: adapted from Venkatesh *et al.*, 2003).

Based on Figure 1, we propose the following hypotheses:

- H1- Social Influence has a positive effect on Performance Expectation in the use of remote classroom platforms.
- H2 - Social Influence has a positive effect on the Effort expectation in the use of remote classroom platforms.
- H3 - Social Influence has a positive effect on the Facilitating Conditions in the use of classroom remote platforms.
- H4 - Performance Expectation has a positive effect on Satisfaction with Intent to continue use of remote classroom platforms.
- H5 - The Effort expectation has a positive effect on Satisfaction with the Intent to continue use of remote classroom platforms.
- H6 - The Enabling Conditions have a positive effect on Intent to continue use of remote classroom platforms.
- H7 – Satisfaction with remote classroom technologies has a positive effect on Intent to continue use of remote classroom platforms.
- H8 - Previous Experience has a positive moderating effect on the relationship between Satisfaction and Intent to continue use of remote classroom platforms.

H9 - Anxiety has a negative effect on Performance Expectation in relation to Intent to continue use of remote classroom platforms.

H10 - Anxiety has a negative effect on the Effort expectation in relation to the Intent to continue use of remote classroom platforms.

4 Methodology

The technique used to understand the conceptual relationships involved was the Structural Equation Modelling (SEM). The method leads to understanding and explanation of the structure of the conceptual model as well as the meaning of the constructs involved as it involves the application of statistical methods that simultaneously analyse multiple criteria observed to compose the target audience: first the participants should be professors of public and/or private Brazilian faculties; and second use digital teaching platform to conduct remote classes taught from anywhere either their residence or their institution.

The survey involved professors (Table 1) from the Amazon region corresponding to 69.8% of the total; that used Microsoft Teams (65.9%) to teach remote classes; from their houses (93.4%); almost 55% are female with more than 50 years old (30%); that declared that the quality of internet service is good (53%).

Table 1: Descriptive summary of respondents' characteristics

Feature	Descriptive results
Gender	Male = 44,7%
	Female = 55,3%
Age	[34; 41] = 24,5%
	[42; 49] = 25,8%
	≥ 50 = 30%
Household income	≤R\$ 10.000 = 55%
	≥ R\$10.001 = 45%
Platform chosen by IES	Microsoft Teams = 65,9%
	Google Meet = 22%
Most used place to teach remote classes	Residence = 93,4%

Source: Authors.

5. Data analysis

Initially convergent validity test discriminating validity at the level of items and constructs as well as composite reliability analysis were performed. Table 2 presents a summary of the internal and external quality indicators of the structural model.

The tests in table 2 demonstrate that the internal and external validities of the model are adequate. In addition, the mean variance extracted (CVA) values of the constructs were above 0.5 and the composite reliability values were above the limit of 0.7 (Hair et al., 2022).

Table 2: Quality criteria of the constructs

Constructs	Item	CF	DV	CC	VME
Intent to continue using	ICU1	0.808	0.774	0.856	0.599
	ICU2	0.670			
	ICU3	0.755			
	ICU4	0.850			
Satisfaction	S1	0.898	0.899	0.927	0.809
	S2	0.917			
	S3	0.883			
Previous Experience	EA1	0.670	0.730	0.820	0.533
	EA2	0.731			
	EA3	0.787			
	EA4	0.728			
Performance expectation	ED1	0.819	0.843	0.908	0.711
	ED2	0.877			
	ED3	0.849			
	ED4	0.826			
Expectation of effort	EE1	0.813	0.871	0.926	0.758
	EE2	0.899			
	EE3	0.900			
	EE4	0.867			
Enabling conditions	CF1	0.816	0.801	0.843	0.642
	CF2	0.801			
	CF3	0.787			
Anxiety	A1	0.858	0.827	0.896	0.683
	A2	0.786			
	A3	0.838			
	A4	0.823			
Social influence	IS1	0.772	0.769	0.852	0.591
	IS2	0.832			
	IS3	0.738			
	IS4	0.728			
CF - Factor load; CC - Composite reliability; VD - Discriminant validity (Fornell-Lacker criterion); VME - Mean variance extracted.					

Source: Authors.

Thus Figure 2 shows the results obtained during the procedure together with the R^2 values for the global understanding of the effects.

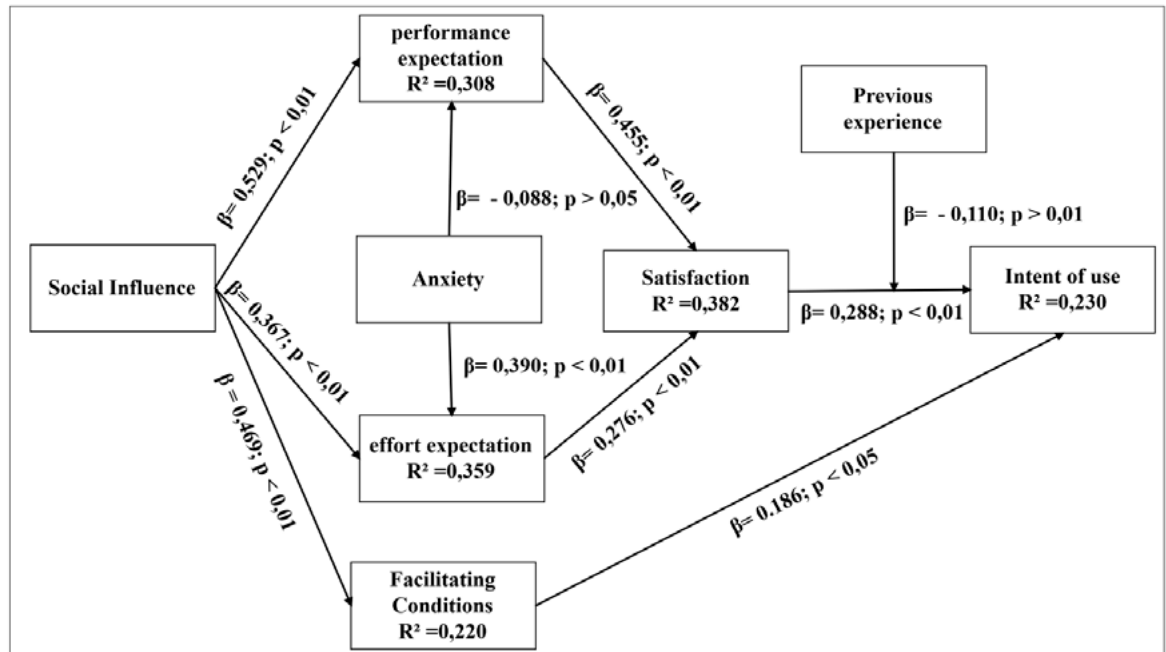


Figure 2: Presentation of the results of the conceptual model

Source: Authors.

The path coefficients shown in Figure 2 point to significant relationships at the level of 1% (p - value < 0.01) except for the relationship between anxiety and performance expectation whose significance is at the level of 10% (p - value < 0.1). For the proposed conceptual model specifically the intention to continue using obtained $Q^2 = 0.119$.

This aspect of the absence of multicollinearity contributes to the quality indicators of the model (Model Fit) where the SRMR = 0.080 (with adequate values < 0.10) RMS Theta = 0.147 (with values < 0.12) (Henseler et al., 2014).

Finally, Table 3 presents the mediation analysis of the paths arising from the effect of social influence on the intention to continue the use of online platforms.

Table 3: Mediation analysis

		Effects	B	SD (STDEV)	T statistic	P value
Mediation 1	Direct	Social influence -> Intent to continue using.	0.210	0.082	2.566	0.010
	Indirect	Social influence -> Performance expectation -> Satisfaction -> Intent to continue using.	0.048	0.020	2.437	0.015
	Total	Social influence -> Intent to continue using.	0.331	0.065	5.093	0.000

		Effects	B	SD (STDEV)	T statistic	P value
Mediation 2	Direct	Social influence -> Intent to continue using.	0.210	0.082	2.566	0.010
	Indirect	Social influence -> Enabling conditions -> Intent to continue using.	0.087	0.039	2.216	0.027
	Total	Social influence -> Intent to continue using.	0.331	0.065	5.093	0.000
Mediation 3	Direct	Social influence -> Satisfaction	0.292	0.056	5.194	0.000
	Indirect	Social influence -> Performance expectation -> Satisfaction	0.174	0.041	4.203	0.000
	Total	Social influence -> Satisfaction	0.536	0.038	13.999	0.000
Mediation 4	Direct	Social influence -> Satisfaction	0.292	0.056	5.194	0.000
	Indirect	Social influence -> Expectation of effort -> Satisfaction	0.070	0.024	2.893	0.004
	Total	Social influence -> Satisfaction	0.536	0.038	13.999	0.000

Source: Authors.

All the proposed mediations have a partial effect which means that the direct effect of social influence on the intention to continue use is significant with $p\text{-value} < 0.001$, as well as indirect paths that also showed significant with $p\text{-value} < 0.01$.

5.1 Discussion of Results

The results show that social influence has a significant effect on performance expectations with $\beta = 0.529$; $p\text{-value} < 0.01$, which demonstrates that even with social distancing in a physical way professors sought the opinion of their groups of influence to be able to perceive the advantages proposed by online class platforms agreeing with concepts of Donnelly et al. (2011).

In this perspective the spectrum of social influence showed an effect on facilitating conditions ($\beta = 0.469$; $p\text{-value} < 0.01$) and an explanation for this fact may be related to training that has become online often with the use of tutoring and the availability of co-workers to support the learning process.

Another relevant aspect is the negative moderating effect of the previous experience on the relationship between satisfaction and intention to continue using ($\beta = -0.110$; $p\text{-value} < 0.01$). This demonstrated that the previous experience with this type of technology makes the user more demanding about the possibilities of using online meeting platforms reducing the effect of satisfaction with the use of the platform with the disposition of continuity of use. In our hypothesis it was expected that this achievement would be positive because the previous experience facilitates learning and improves the perception of the functionalities of the technology (Tomczyk et al., 2020). However, the opposite effect to the expected demonstrates another facet of this construct linked to the requirement of possibility in use and the comparison between similar products existing in the market because the greater the previous or even current experience with software and hardware the lower the effect of satisfaction with the platform on the continuity of use due to these aspects promoted by the technological experience of the user.

The mediation tests presented in table 3 demonstrate that in all 4 (four) paths analyzed from the social influence which lead to the intention to continue using (mediations 1 and 2) and satisfaction (mediations 3 and 4) that the mediation of the constructs involved in the specific paths (indirect paths) is significant $p - \text{value} < 0.01$. However, with latency values lower than those on the direct path which also presented significance $p - \text{value} < 0.01$. Thus, the mediations analyzed are classified as partial with a strong effect of social influence on the model (Hair et al., 2022). In this sense social influence proved to be a fundamental construct to the perception of the aspects that involve the acceptance of technology specifically in the scenario of restrictions regarding face-to-face social interaction.

6. Conclusion

The main goal of the paper was to analyze how social influence can act as an antecedent in relation to the expectation and perception of professors regarding the adoption and intention to continue use of digital platforms for remote classes. The results pointed to a significant effect of social influence on professors' expectations regarding the effort and performance to manage the online class platforms with a positive perception about the support promoted by the faculties.

Even though the focus is not to generalize the results but to contribute to empirical studies on the subject it is pointed out the limitation of having a high percentage of participants from the Amazon region which has the lowest coverage of internet access in the country which can affect the perception of users regarding the quality and performance of online class platforms.

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