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Artigo Original

Prospective Reactions of Students towards Remote Studies during the Covid-19 Pandemic

Reações Prospectivas de Estudantes frente aos Estudos Remotos durante a Pandemia da Covid-19

Prospecciones de Estudiantes para los Estudios Remotos durante la Pandemia de la Covid-19

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Abstract

Due the Covid-19 Pandemic and the quarantine and social distancing actions, the face-to-face classes of about 1.5 billion students in 165 countries were suspended. This study, therefore, aims to investigate the prospective reactions of students of technical and higher education courses regarding the possibilities of remote study in the social distance period in Brazil. A survey was conducted with 266 students through an online questionnaire. Multivariate statistical analyses (e.g., factor

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analysis and multiple linear regressions) were performed. The results highlight the students' interest in maintaining their studies remotely. However, conditions of access and use of technologies, socioeconomic circumstances and the (de)motivation and influence of the home environment are determining factors for the continuity and effectiveness of the studies.

Keywords: Education. Social Distancing. Emergency Remote Education. COVID-19. Brazil.

Resumo

Em virtude da pandemia relacionada ao novo coronavírus (SARS-CoV-2), causador da Covid-19, e as consequentes ações de quarentena e distanciamento social, as aulas presenciais de cerca de 1,5 bilhão de estudantes em 165 países foram suspensas. Este estudo, portanto, tem por objetivo investigar as reações prospectivas de estudantes de cursos técnicos e superiores presenciais quanto às possibilidades de estudo remoto no período de distanciamento social no Brasil. Desenvolveu-se uma pesquisa com 266 estudantes de cursos presenciais por meio de um questionário on-line e realizaram-se análises estatísticas multivariadas, como análise fatorial e regressão linear múltipla. Os resultados destacam o interesse dos estudantes em manter os estudos remotamente. Entretanto, condições de acesso e uso de tecnologias, conjunturas socioeconômicas, (des)motivação e influência do ambiente domiciliar mostram-se determinantes para continuidade e efetividade dos estudos.

Palavras-chave: Educação. Distanciamento Social. Educação Remota Emergencial. Covid-19. Brasil.

Resumen

Debido a la pandemia relacionada con el nuevo coronavirus (SARS-CoV-2), causante de Covid-19, y las acciones de cuarentena y distanciamiento social, se suspendieron las clases presenciales de alrededor de 1.500 millones de estudiantes en 165 países. Este estudio, por lo tanto, tiene como objetivo investigar las prospecciones de los estudiantes de

los cursos de educación técnica y superior con respecto a las posibilidades de estudio remoto en el período de distanciamiento social en Brasil. Se realizó una encuesta con 266 estudiantes a través de un cuestionario online. Se realizaron análisis estadísticos multivariados (p. Ej., análisis factorial y regresión lineal múltiple). Los resultados resaltan el interés de los estudiantes en mantener sus estudios de forma remota. Sin embargo, las condiciones de acceso y uso de las tecnologías, las condiciones socioeconómicas y la (des)motivación e influencia del entorno familiar son cruciales para la continuidad y efectividad de los estudios.

Palabras clave: Educación. Distanciamiento Social. Educación Remota de Emergencia. Covid-19. Brasil.

1. Introdução

Responsible for a worldwide pandemic that has already caused about 367,166 deaths between January and May 2020 (WHO, 2020), the new coronavirus (SARS-CoV-2), which causes Covid-19, is a newly identified virus in humans which causes respiratory diseases with symptoms of cough, fever, shortness of breath (RODRIGUEZ-MORALES et al., 2020) and dysfunctions of smell and taste (BAGHERI et al., 2020), which, in aggravated conditions, can lead to pneumonia . The impacts on health in the medium and long term are still uncertain (PEERI *et al*., 2020).

In this scenario, the governments of countries around the world have been promoting actions to mitigate and suppress contagion, adopting, mainly, restrictive measures of distancing, quarantine and social isolation, with mandatory stay at home, carrying out remote work (home office) and closing , for example, from public places, shops and educational institutions (schools, colleges, etc.) (ANDERSON *et al*., 2020; BEDFORD *et al*., 2020).

With the closure of educational institutions, according to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2020), the face-to-face classes of about 1.5 billion students in 165 countries (from kindergarten to post -Graduation) are suspended, which strongly affects school performance and evolution.

In Brazil, the suspension of classes harms, for example, the preparation for the National High School Examination (Enem) and the completion of professional courses and academic training (ARRUDA, 2020).

As a result, temporary changes have been studied (or implemented) in the face-to-face classes regime - made impossible by the necessary social isolation - to remote classes, using Distance Education tools and methodologies. In this context, the Brazilian federal government, through Ordinances 343/2020, 345/2020, 376/2020 and 395/2020 (BRASIL, 2020), has exceptionally authorized, since March 18, 2020, the replacement of classes face-to-face classes taught remotely (valid as school days) by digital means and information and communication technologies - considering current legislation and vetoed medical courses and laboratory disciplines.

The question to be analyzed is whether the students of on-site courses have the availability and technical, social and family conditions to continue (albeit temporarily) studies remotely. The objective of this study, therefore, is to investigate the prospective reactions of students of technical and on-campus higher education courses regarding the possibilities of remote or distance classes during the Covid-19 pandemic period in Brazil. The study sheds light on a phenomenon that goes beyond the epidemic sphere and covers educational, economic and sociological issues.

2. Theoretical foundation

2.1. Possibilities of Emergency Remote Education

Worldwide, remote classes, through the use of Distance Education (DE) tools, have been considered as an alternative to replace face-to--face classes due to the Covid-19 pandemic (VINER et al., 2020). This is because DE is established as a teaching-learning process mediated primarily by Digital Information and Communication Technologies (TDICs), in which students, teachers (including tutors and pedagogical support) and managers are physically separated (space-time) and whose didactic-pedagogical activities presuppose the use of different

strategies and particular media tools (MILL, 2012). Thus, remote teaching is methodologically aligned with the educational needs of the present moment.

In order to expand educational practice, the advancement and diffusion of digital social media (YouTube, Instagram, Facebook, WhatsApp, LinkedIn, Telegram etc.) provide a different look at the didactic-pedagogical possibilities on screen (SANTOS JUNIOR; MONTEIRO, 2020). This articulation for the adoption of remote classes and the performance of non-face-to-face activities - mainly at the political level -, however, neglect the particularities of the student, the teacher and the face-to-face school (BARRETO; ROCHA, 2020; MACEDO et al., 2020). Arruda (2020) also warns that replacing classes using digital technologies and remote activities is not the same as using distance education, even though there are technical and methodological similarities.

Conceptually, EaD is an educational modality that provides for the construction of knowledge in an autonomous way, comprising the development of the student in the medium and long term, with the support of previously trained teachers and tutors, own standardized didactic-pedagogical material (produced in scale) and specific platforms for this purpose, considering a logical structure and aesthetic quality (BELUCE; OLIVEIRA, 2016; COELHO; TEDESCO, 2017; NUNES et al., 2019).

On the other hand, emergency remote education is an adaptation of distance learning tools and techniques, together with interaction through digital social media and the availability of didactic and academic material (in printed or digital format) (ARRUDA, 2020).That is, a hybrid model that works, sometimes synchronously, sometimes asynchronously, with greater methodological freedom (SILVA; SANADA, 2018).

For this, the possibilities of adapting the teaching-learning process for use during the suspension of face-to-face classes should be explored (SANTOS JUNIOR; MONTEIRO, 2020). The first step towards a viable proposal is the adoption of learning support platforms (asynchronous space), such as virtual learning environments traditionally used in distance education (such as Moodle) or content management and sharing environments (such as Google Classroom).

Then, it is necessary to adopt audiovisual interaction tools, simulating a live environment and promoting real-time communication between students and teachers (synchronous space), such as virtual environments for direct communication and video conferencing (Zoom, Google Meet, Skype) and digital social networks (lives on YouTube and Instagram). Alternatively, television and radio are used. From this, it is possible to outline a plan for an effective dialogue with the curriculum contents (MUNHOZ, 2018; SILVA; SANADA, 2018).

According to Moran (2018), in addition to infrastructure (equipment, internet access, mobility, etc.), it is essential that students, teachers, pedagogical assistance and the school environment have digital skills, integrating curriculum and digital technologies.

Emergency remote education, despite the underlying limitations, has its relevance based on the partial maintenance of the link between students and teachers, given that the complete departure from school environments throughout the pandemic may imply disinterest, demotivation, delay in the learning process and, consequently, inequality (SANTOS JUNIOR; MONTEIRO, 2020).

2.2. Digital Literacy

Despite the possibilities of remote emergency education, it is necessary to consider the challenges inherent to existing distance courses, such as resistance, unavailability and prejudice, which culminate in school dropout (ALMEIDA et al., 2013; LIMA; RODRIGUES; VIANA, 2016). The apparent condition for these problems is justified, in part, by the lack of access and the lack of mastery of digital and computational tools, essential for the proper use of DICTs (SILVA *et al.*, 2019).

Academic performance, specifically in distance education, tends to demonstrate better results with the mastery of digital and computational tools that facilitate synchronous and asynchronous communication. This prerogative can be defined as Digital Literacy, that is, the domain of knowledge and languages specific to digital technologies (MILL, 2013; SILVA *et al.*, 2019).

From a purely technical view, Mill (2013) explains that the basic curriculum for Digital Literacy encompasses the understanding of computers and information technology (software and hardware), the use and conscious work with folders, files and storage, research and communication through the internet, the precise use of email tools, and, finally, the ability to explore text editors, spreadsheets, graphics, images/drawings and multimedia.

Indeed, Digital Literacy is an active process that involves the practice of digital reading and writing, including gradual skills and competences. Digital Literacy, therefore, is linked to factors of learning, consumption, collaboration and creation within digital environments (MILL, 2013; SILVA *et al*., 2019). Based on this conception, Lima Junior (2013) classifies users of TDICs based on knowledge of use and exploration and related experiences, namely: (1) Newbie, (2) Intermittent User, (3) Casual User, (4) Expert User - Level 1 and (5) Expert User - Level 2.

However, the technicist bias imposes an exacerbated valorization of computer, digital and technological resources in detriment of a more comprehensive education process associated with a capacity for human dialogue and aware of the limitations and possibilities of digital DICTs. That is, the ability and mastery of knowledge and technical skills of using, interacting and exploring tools and digital DICTs (spreadsheets, text editors, image manipulation, emails etc.) do not necessarily imply a full and humane education , whose social skills and psychosocial maturity are essential for a meaningful civic and professional life (RIBEIRO; COSCARELLI, 2017; AZEVEDO et al., 2018).

Digital Literacy presupposes traditional knowledge, so that the effective mastery of text editing tools, for example, is associated with the mastery of language, cultured language norms, text production and literature. Likewise, the effective domain of spreadsheets must be associated with the domain of mathematics (algebra and geometry) and statistics. And yet, the domain of social networks and communication tools must be associated with the domain of intra and interpersonal intelligence, which culminates in cooperation, respect, ethics, morals, professionalism, etc. (MILL, 2013; MILL; JORGE, 2013; SILVA *et al*., 2019).

Under a holistic view, it is understood that Digital Literacy emerges as an instrumental foundation of social practices, whose inherent digital competences allow the learning and understanding of content relevant to life. The effective performance of the individual in today's society involves overcoming the problems of digital inclusion (RIBEIRO; COSCARELLI, 2017).

3. Methods

3.1. Participants and Sample Procedures

266 Brazilian students from on-site courses participated in the study (55.6% female), with an average of 20 years (range from 18 to 59 years of age; SD = 5.3662), of which 69.5% took technical courses , 29.7% of higher education courses and 0.8 of graduate courses (lato sensu). The participants were from 10 (ten) different educational institutions in 4 (four) Brazilian federal states, namely: Minas Gerais (97.7%), Rio de Janeiro (1.5%), Bahia (0.4%) and Ceará (0.4%). Of the participants, two (0.8%) reported suspicion of contagion by Covid-19 and 16 (6%) reported suspicion or confirmation among relatives and close friends of contagion by Covid-19.

The sampling procedure was non-probabilistic, with data collection for accessibility and individually, in which students from classroom courses were invited by social networks to respond, voluntarily, between 10 and 15 May 2020, to the online questionnaire.

The participants were informed about the study and about the anonymity and confidentiality of their responses, requiring the signature of a Free and Informed Consent Term, guaranteeing the voluntary nature of participation and respect for the ethical guidelines that govern research with human beings (CAAE: 30850620.2.0000.0008). On average, 9 (nine) minutes were required to complete participation in the study.

3.2. Instruments

To carry out this study, the following research instruments were used:

(i) Scale of Prospective Reactions to Distance Studies (ERP-ED): self-report psychometric test, developed in this study based on the theoretical framework on screen, to measure the prospective reactions of students in classroom courses regarding remote classes in the period of social distance in Brazil. The term "distance studies" was used, operationally, to represent remote studies. It is worth remembering that, at the time the research was planned and executed, the term "remote emergency education" did not yet exist, therefore, ambiguity coexists with the term "at a distance". Thus, the test is based on a Likert-type scale of 5 continuous points (ranging from 1 = Totally Disagree to 5 = Totally Agree), consisting of 20 items, related to the suspension of classes, the possibilities of remote studies and everyday experiences, as: "I want to take advantage of the suspension of classes to stimulate my personal projects" and "I am willing to continue my classes through distance learning".

(ii) Questionnaire on Conditions for the Use of Digital Information and Communication Technologies (QCU-TDIC): questionário desenvolvido neste estudo para verificar a efetividade dos estudos remotos a partir das expectativas de uso de tecnologias digitais. The questionnaire is based on a scale of 5 categorical points, composed of 7 items, such as: "Daily time available for remote activities (reading and writing, answering forums, etc.) "and" Ability to use computational tools (text editors, spreadsheets, presentations, web browsing, etc.)".

(iii) Sociodemographic Questionnaire: designed to know and characterize the sample. This complementary questionnaire included questions such as gender, age, location, course, institution where you study, social class and suspicions or confirmations of Covid-19 cases from the student himself or from family and close people.

3.3. Analyzes

The data were processed and analyzed using descriptive statistics with simple parameterization (frequency, percentage, mean, standard deviation and 95% confidence interval). To support the interpretation of the results, the Association Coefficient [χ^2 (1) ≥ 3.84; p <0.05] and Pearson's r correlation (two-tailed).

In order to understand the elements that best explain the perception, expectations and prospective reactions of students in relation to remote studies, the use of exploratory factor analysis (AFE) was judged, for the purpose of reducing items, with the objective of finding the most parsimonious of elements that explain the constructs evaluated. The internal consistency of the research instruments was verified using Cronbach's alpha. In addition, in order to test an explanatory model for the analyzed constructs, multiple linear regression (stepwise method) was used, considering the covariance matrix and evaluating homoscedasticity and multicollinearity between the predictor variables. The analyzes followed the validity parameters recommended by Hair et al. (2010).

4. Results

4.1. Descriptions of Expectations about Distance Studies

The descriptive of the Prospective Reactions to Distance Learning Scale (ERP-ED), as shown in Table 1, show that a large part of the students of on-site courses show interest in performing academic/school activities remotely during the period of social distance. The items with the highest scores highlight the students' desire for continuous access to teachers, receiving study materials and information by email or other digital platforms.

This finding is corroborated by the item with the lowest score, which basically emphasizes that these students have little or no domestic activity that prevents them from performing academic/school activities remotely. The Association Coefficient (χ^2) - used to detect interaction between variables in the sample - pointed to the existence of a statistically significant relationship (p <0.05), for example, between

the demands for domestic activities of the investigated students (item 20) and items with higher scores, such as items 1 [$\chi^2(16) = 29{,}950$; $p = 0{,}042$], 2 [$\chi^2(16) = 40{,}381$; $p = 0{,}001$], 3 [$\chi^2(16) = 34{,}606$; $p = 0{,}004$] e 4 [$\chi^2(18) = 36{,}809$; $p = 0{,}002$].

Table 1 - Students' expectations about studies in the period of social distance

Items		Average	DP	No	Maybe	Yes
1.	I would like to have quick and easy access to my teachers to answer questions.	4,32	0,893	3,4%	15,4%	81,2%
2.	I believe that social networks could be used for my teachers to share academic and study information.	4,14	1,048	8,3%	17,4%	74,3%
3.	I believe it is interesting to receive academic materials (eg, books, articles) by email, during this period of social distance.	3,98	1,139	11,3%	16,9%	71,8%
4.	I would like the educational institution in which I study to offer remote studies during social distance.	3,76	1,292	15,8%	23,3%	60,9%
5.	I believe that the suspension of classes is not a good thing for my career and my professional interests.	3,71	1,301	20,3%	19,2%	60,5%
6.	I am willing to continue my classes through distance learning.	3,64	1,308	20,3%	23,3%	56,4%
7.	I feel uncomfortable with the suspension of classes.	3,62	1,272	18%	26,7%	55,3%
8.	If I study, I am able to carry out assessments (tests) online.	3,46	1,420	26,7%	19,9%	53,4%
9.	My professional demands have been less intense in this period of social distance.	3,43	1,293	22,9%	24,4%	52,7%
10.	I want to take advantage of the suspension of classes to stimulate my personal projects.	3,49	1,147	18,8%	29,3%	51,9%
11.	I would like to participate in discussion forums with my colleagues on subjects in my field of study.	3,33	1,310	28,9%	24,4%	46,7%
12.	I feel that I would have difficulty carrying out my studies remotely.	3,16	1,395	32,7%	22,9%	44,4%
13.	Regardless of my school/college, I continue to study during this period of social distance.	3,23	1,266	28,6%	28,6%	42,8%
14.	I have difficulty reading books (e-book or PDF) on the computer screen.	2,97	1,499	40,2%	19,2%	40,6%
15.	I have been unmotivated to read books in this period of social distance.	2,89	1,372	42,1%	24,1%	33,8%
16.	The environment at home does not allow me to concentrate for distance studies.	2,74	1,375	47,7%	21,1%	31,2%
17.	In the period when I was supposed to be in class, I haven't been doing productive things.	2,84	1,315	41,4%	27,8%	30,8%
18.	I have experience with Virtual Learning Environments (VLE).	2,54	1,425	53,4%	19,5%	27,1%
19.	I believe that, after the period of social detachment, I will feel unmotivated to continue my studies.	2,15	1,295	66,2%	14,7%	19,1%
20.	My domestic commitments prevent me from carrying out any other activities.	1,84	1,009	77,8%	13,5%	8,7%

Source: Research data.

Despite this, it is noteworthy that part of the students (ranging from 8% to almost 50%) has some reservations regarding remote studies. In item 12, for example, about 44.4% of students strongly believe that they would have difficulty carrying out studies remotely, while 22.9% conjecture this possibility. The same scenario can be seen more forcefully in items 14 and 16, in which the existence of a statistically significant relationship ($p < 0.05$) is verified between the difficulty in carrying out the studies remotely (item 12) and the difficulty concentration (item 16) [χ^2 (16) = 71.670; p = 0.000] and reading texts (e-book or PDF) by computer or tablet (item 14)[$\chi^2(16) = 36{,}522$; p = 0,002].

4.2. Elements of Convergence and Explanation

Since the items stimulate discussions about the underlying context, there is a need for a more robust and parsimonious explanation for the factors investigated. Thus, it was established to raise the elements of convergence and explanation for this construct, using exploratory factor analysis (EFA).

The adequacy of the data and the factorability of the correlation matrix of the ERP-ED items were verified, using the Kaiser-Meyer-Olkin (KMO) statistics = 0.849 and Bartlett's Sphericity Test, χ^2 (190) = 1759,664; p = 0,000, EFA was performed, using the Varimax rotation method with Kaiser standardization. Three (3) factors were extracted (Table 2), with an explanation of 47.489% of the total variance and factorial loads that varied from |0,441| to |0,858|.

Tabela 2 - Cargas Fatoriais, Consistência Interna e Extração de Componente

Items	Factor Loads by Factor		
	1	2	3
I am willing to continue my classes through distance learning.	0,858		
I would like the educational institution in which I study to offer remote studies during social distance.	0,838		
I believe that social networks could be used for my teachers to share academic and study information.	0,749		
I would like to participate in discussion forums with my colleagues on subjects in my field of study.	0,693		
If I study, I am able to carry out assessments (tests) online.	0,675		
I believe it is interesting to receive academic materials (eg, books, articles) by email during this period of social detachment.	0,656		
I feel that I would have difficulty carrying out my studies remotely.	-0,618		
I would like to have quick and easy access to my teachers to answer questions.	0,545		
I have experience with Virtual Learning Environments (VLE).	0,525		

My domestic commitments prevent me from carrying out any other activities.		0,633	
The environment at home does not allow me to concentrate for distance studies.		0,603	
I believe that the suspension of classes is not a good thing for my career and my professional interests.		0,566	
I have difficulty reading books (e-book or PDF) on the computer screen.		0,568	
I feel uncomfortable with the suspension of classes.		0,535	
I have been unmotivated to read books in this period of social detachment.		0,467	
I believe that, after the period of social detachment, I will feel unmotivated to continue my studies.		0,451	
In the period when I was supposed to be in class, I haven't been doing productive things.			0,775
Regardless of my school / college, I continue to study during this period of social distance.			-0,709
I want to take advantage of the suspension of classes to stimulate my personal projects.			-0,461
My professional demands have been less intense in this period of social distance.			0,441
Internal consistency (Cronbach's alpha, α)	0,870	0,655	0,514
Quantity of items	9 items	7 items	4 items
Eigenvalue	5,343	2,579	1,575
Variance Explained (%)	47,489%		

Source: Research data.

As shown in Table 2, the EFA showed that the items are grouped into 3 major characteristics that explain the expectations of students in classroom courses on remote studies during the period of social distance, namely:

Factor 1 – availability and interest in distance learning (9 items), which represents the propensity, accessibility and aspiration of students in on-site courses to continue remote studies during the period of social distance. Basically, it assesses the students' claims, taking into account their personal interests and their psychosocial conditions, covering items such as “I am willing to continue my classes through distance learning” or “I would like the educational institution in which I study to offer remote studies during social distance”.

Factor 2 – demotivation and influence of the home environment (7 items), which represents the stimuli to which the students are submitted, within the home and family environment, which may inhibit the conditions of remote studies or other school, academic or professional activities, covering items such as "the home environment does not allow me to concentrate on distance learning" and "my domestic commitments prevent me from carrying out any other activities".

Factor 3 – attitudes and actions towards studies and professional demands (4 items), which represents students' objectives, goals and intentions regarding their own daily activities and practices during the period of social detachment, covering items such as "when I was supposed to be in the classroom, I haven't been doing productive things "and" regardless of my school/college, I continue to study during this period of social distance".

The instrument (ERP-ED), therefore, presents a coherent and representative empirical structure of the current scenario, providing a parsimonious explanation for the construct on screen. In terms of functionality, you can explore and test your modulations with other constructs, as shown in the following sections.

4.3. Skills and Technical Capacity with DICTs

Initially, we sought to verify the validity and internal consistency parameters of the Conditions Questionnaire for the use of digital DICTs (QCU-DICT). The adequacy of the data and the factorability of the correlation matrix of the items of the QCU-DICT were verified [Kaiser-Meyer-Olkin (KMO) = 0.772; Bartlett's Sphericity Test, χ^2 (21) = 539.669; p = 0.000], the EFA was performed, with a non-rotated matrix. One (1) factor (eigenvalue = 3.149) was extracted, with a total explained variance of 44.982% and factorial loads ranging from | 0.559 | a | 0.771 |, presenting internal consistency of α = 0.789, denoting satisfactory parameters of validity and reliability (HAIR et al., 2010). The items with the best explanatory power for the instrument were "ability with digital platforms" (factorial load = 0.771) and "ability with the use of computational tools (text editors, spreadsheets, PowerPoint, web browsing, etc.)" (factor load = 0.765).

The descriptive results of the QCU-DICT, as shown in Table 3, show that most of the students in classroom courses demonstrate that they have access to equipment and technical skills with digital platforms and sufficient computational tools to perform remote studies or non-classroom activities through digital DICTs.

Table 3 - Access, Skills and Technical Capacity with digital DICTs

Study availability	No time availability	Less than an hour a day	Between 1 and 2 hours a day	Between 3 and 4 hours a day	More than 4 hours a day
	1,9%	4,9%	25,9%	39,8%	27,4%
Internet access	Little or no access	Access with connection difficulties	Limited access, no connection difficulties	Continuous access without connection difficulties	Unlimited access, with fast connection
	3%	13,9%	15,8%	40,2%	27,1%
Digital Platforms Computational Tools1	No skills	Little skill	Limited skills	Substantial skills	Expertise or Great skills
	4,1%	14,3%	26,7%	39,5%	15,4%
	4,9%	15%	21,4%	36,8%	21,8%
Digital Equipment (tablet, smartphone, etc.) Computational Equipment (PC or notebook)	Doesn't have	Has, but no internet access	Has, with internet access	Has several equipments2, with internet	
	2,6%	3,8%	42,1%	51,5%	
	15%	3,8%	47,4%	33,8%	
Conditions for taking subjects remotely	No subjects	Only one subject at a time	More than one subject, as long as you could choose	All the subjects	
	3%	12%	45,2%	39,8%	

Source: Research data.

Note. 1 Text editor, spreadsheet, presentation etc. 2 Printer, audio/video, available memory.

It is worth mentioning that 15% claimed not to have a computer or notebook at home. However, only 3% claimed to have little or no access to the internet, while 13.9% claimed to have access to the internet, but with connection difficulties (Table 3). This leads to the conclusion that

students' access to the Internet would be largely via smartphone/tablet using mobile data (4G) from the telephone operator. The Association Coefficient (χ^2) indicates the relationship between having access to the internet and having computer equipment [χ^2 (12) = 83.582; p = 0.000], corroborating this line of reasoning.

In addition, since 3% also claimed that they could not take any discipline remotely, with a statistically significant relationship (p <0.05), with internet access [χ^2 (12) = 97,200; p = 0.000]; there is a probable indication that students believe that they will carry out remote studies using smartphones or tablets only.

4.4. Testing Predictive Models

Therefore, a hypothetical-theoretical model was proposed in which exogenous variables (sociodemographic, educational and epidemiological data) were established as possible predictors of the following endogenous variables: (i) Factor 1 – Availability and interest in distance learning; (ii) Factor 2 – Demotivation and influence of the home environment; (iii) Factor 3 – Attitudes and actions towards studies and professional demands; e (iv) Factor 4 – Access, Skills and Technical Capacity with DICTs.

Among the exogenous variables tested, only the Social Class showed a moderate predictive relationship with Factor 4 - Access, Skills and Technical Capacity with TDICs. In such a way, given the significance of the regression model (p = 0.000) and the low possibility of error (standard error = 0.033) of prediction to the criterion variable, the acceptance of the model was considered (Table 4).

Table 4 - Regression Model for Social Class Predicting Factor 4

Predictor Variables	Pearson's r	B	Standard Error	B	T	*p*
Constant		2,954	0,113		26,228	0,000
Social class	0,287 (0,000)	0,160	0,033	0,287	4,844	0,000
					R = 0,287	

					R2 = 0,082
					R2 adjusted = 0,079
					F (1, 262) = 23,460; *p* = 0,000

Source: Research data.

Since the results did not show a predictive relationship between exogenous variables and factors 1, 2 and 3 (from ERP-ED), the correlation matrix between these factors and Factor 4 was further analyzed in order to understand the collinearity between the factors. endogenous variables (Table 5).

Table 5 - Descriptive Factor Statistics

	Statistic	Factor 1	Factor 2	Factor 3	Factor 4
Factor 1	Average	3,5556	2,8464	2,8863	3,4689
	Standard Error	0,0538	0,0456	0,0491	0,3925
	Factor 2	1,22 – 5,0	1,0 – 5,0	1,0 – 5,0	1,43 – 4,57
	DP	0,87898	0,74508	0,80153	0,64019
	Factor 3	0,773	0,555	0,642	0,410
	IC de 95% LI-LS	3,44 – 3,66	2,75 – 2,93	3,46 – 3,39	3,39 – 3,54
	Factor 4		-0,258**	-0,148*	0,536**
			0,000	0,016	0,000
Fator 2	*R*	-0,258**		0,291**	-0,271**
	P	0,000		0,000	0,000
Fator 3	*R*	-0,148*	0,291**		-0,103
	P	0,016	0,000		0,094
Fator 4	*R*	0,536**	-0,271**	-0,103	
	P	0,000	0,000	0,094	

Source: Research data.

*The correlation is significant at the 0.05 level (2 ends).
**The correlation is significant at the 0.01 level (2 ends).

The correlation matrix shows a strong relationship (r = 0.536) between factors 1 (availability and interest in distance studies) and 4 (access, skills and technical capacity with DICTs). Both factors 1 (r = -0.258) and 4 (r = -0.271) show no correlation with factor 2 (demotivation and influence of the home environment), which is statistically significant at p <0.000.

Due to the availability of the data, it was found that Factor 1 could be considered as a criterion variable (dependent) for the other factors tested, as well as for exogenous variables. Then, a regression model was proposed in which all exogenous variables (sociodemographic, educational and epidemiological data) and factors 2, 3 and 4 were established as possible predictors of Factor 1. The multiple hierarchical regression (stepwise method) presented satisfactory parameters of model adjustment, which explained 36.1% of the Factor 1 variation (Table 6).

Table 6 - Factor 4, Factor 2 and Age Model Predicting Factor 1

Predictor Variables	Pearson's r	B	Standard Error	B	T	*p*
Constant		0,718	0,378		1,898	0,050*
Factor 4	0,536 (0,000)	0,749	0,071	0,545	10,487	0,000
Age	0,143 (0,020)*	0,036	0,007	0,251	5,000	0,000
Factor 2	-0,258 (0,000)	-0,153	0,061	-0,130	-2,532	0,012*
					R = 0,601	
					R2 = 0,361	
					R2 adjusted = 0,354	
			F (3, 262) = 49,418; *p* = 0,000			

Source: Research data.

* Significant at 0.05 level (2 ends).

The results show that Factor 4 (access, skills and technical capacity with TDICs), the age of the students, and Factor 2 (demotivation and influence of the home environment) were, together, explainers of Factor 1 (availability and interest in distance studies). Figure 1 shows the layout of the tested predictive models visually.

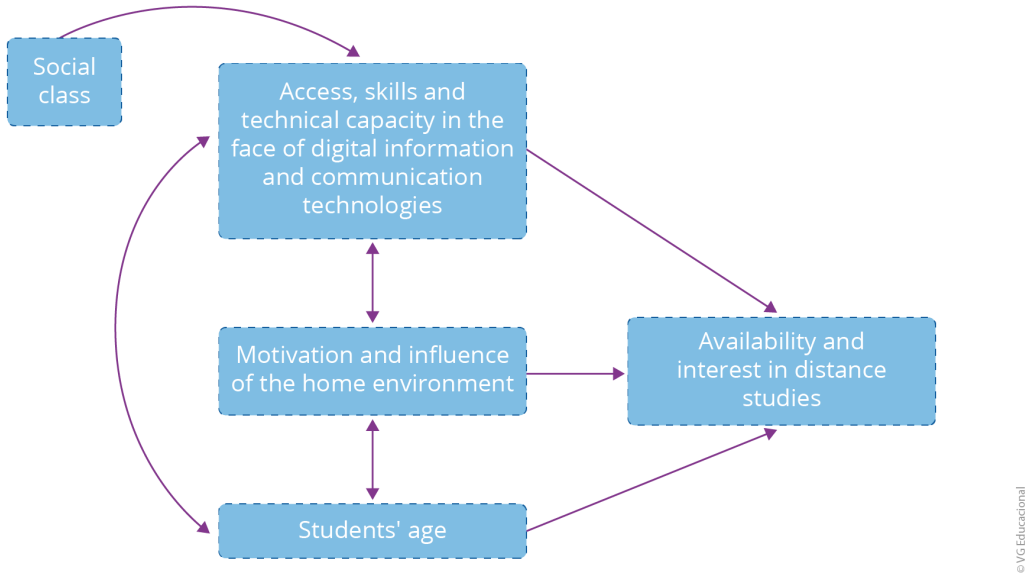

Figure 1 - Predictive Models Diagram

Source: Created by the authors.

It appears, then, that better socioeconomic conditions (responsible for greater access to the internet and computer equipment, as well as technical conditions for the use of digital tools), older age of students and less demotivation (negative factor Factor 2 with Factor 1) - read, also, greater motivation - associated with the home environment, predictively implies greater availability and interest in remote studies.

5. Discussion

This study provides an overview of the needs and expectations of students in technical and higher education courses regarding the possibilities of remote studies during the period of suspension of classes due to the Covid-19 pandemic. It is worth noting that the results show that the availability and interest of students in classroom courses with the

possibilities of remote studies are explained primarily by the conditions of access and use of DICTs, which includes internet, equipment and knowledge applied to information technology - related to that kind of knowledge the concept of Digital Literacy.

Notably, it appears that students' propensity for remote studies is confirmed by the technological support at their disposal. That is, the basic needs that make this study format stand out, a priori, such as: internet, personal computer or notebook, smartphone or tablet, printer etc., under the consideration that the teacher is fit to the offer conditions.

However, considering that the conditions of access and use of DICTs to students presented the social class as a central predictor (empirically operated as socioeconomic circumstances), it is possible to state that other conditions are as relevant as, such as adequate food, safety, hygiene and health , converging in a home and family environment conducive to studies.

This goes hand in hand with the second predictor of the availability and interest of students in face-to-face courses with the possibilities of remote studies during the period of social distance: demotivation and the influence of the home environment.

Demotivation and the influence of the home environment are related, for example, to family and / or domestic demands, to the difficulty of reading digital materials (books, articles etc.) through the computer screen or smartphone / tablet and the ability to concentrate within the home environment regarding external and internal interventions. In this context, Sanchez-Taltavull et al. (2020) explain that the productivity of work during the period of social detachment is related to the rates of Covid-19 infections and the efficiency of home office practices (work/studies at home). According to the model of the authors, during the period of infections of Covid-19, it is estimated a reduction of productivity of about 50% with the format of work/studies at home.

Barros and Silva (2010) highlight conditions for work / studies at home: (i) self-discipline, (ii) easy access to peers and the reference institution, (iii) delimitation of resources and procedures to be used, (iv) nature of tasks and activities, (v) numbers of people in the home and incidence of young children, and (vi) adequacy of the domestic space.

So, it is necessary to consider the existence or lack of adequate environments, the student's capacity for autonomy, deficiencies in basic training that, as a consequence of this and other factors, implies difficulty in handling technological tools (if you have them). This fact reveals the need to face these possibilities of remote emergency education with balance - in addition to the specificities of a more complex dimension referring to the teaching-learning process, such as the use of innovative and hybrid methodologies.

6. Final Considerations

This study contributes to the mapping of factors that can be configured as facilitators or barriers for the adoption of school management actions regarding the resumption of classes during the period of social distance through remote studies marked by DICTs. Due to the importance of these and other actions for the current educational moment, the results found underscore the need to investigate the context of insertion of educational practices in the student's home routine, with a view also to the availability and updating of the devices technological resources to be used.

In addition, these findings demonstrate applicability to other pandemic situations or scenarios in which social isolation procedures are necessary, such as lockdown. The possibility of new periods of stoppage, even, are predicted by Kissler et al. (2020), in which isolation or quarantine, sometimes prolonged, sometimes intermittently, should be necessary until 2022, since the recurrence of contagion by Covid-19 or resurgence of the pandemic may still be possible until mid-2024. In other words, as long as the disease is not overcome, it is likely that remote teaching strategies will prevail in Brazilian education, and it is up to the entities involved to continually equip and activate training conditions for their collaborators and teachers, so that there is a reduction in the educational losses that occur. evidence with the pandemic.

In methodological terms, the study contributes to the presentation of the ERP-ED instrument, with satisfactory parameters of validity and reliability, which forms a measure composed of 3 dimensions: (i)

Availability and interest in distance studies; (ii) Demotivation and influence of the home environment; and (iii) Attitudes and actions towards studies and professional demands -, which converge confidently to predict the behavior of students in classroom courses to the possibilities of remote studies.

The limitations of this study are, especially, on the small sample size and the influence of the temporal aspect - since the data presented here were collected in May 2020. The results found, therefore, should be treated carefully, as they present only indications of what may occur on a large scale in Brazil. Thus, there must be new future research that deepens the elements investigated.

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