SECTION: ARTICLES

Remote teaching for health academics in the COVID-19 pandemic

O ensino remoto para acadêmicos da saúde na pandemia de COVID-19

Enseñanza remota para académicos de la salud durante la pandemia de COVID-19

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ABSTRACT

During the COVID-19 pandemic, a global shift to remote education has occurred. This study investigated the impact of remote teaching on health students at a public university in Amazonas, Brazil. The participants were students of the Nursing, Medicine and Dentistry courses, submitted to completely remote learning. Data collection was carried out online, followed by statistical analysis. In total, 175 students participated, representing 17.6% from Nursing, 20.6% from Medicine and 19.7% from Dentistry. Most participants were female (68.0%) and entered through the capital's admission system (65.1%). Considering the negative impact of the pandemic, 46.3% of students reported feeling frequently harmed by fully remote teaching. According to the students' perception, most professors were not adequately prepared for distance learning and active educational strategies proved to be ineffective; the

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lack of motivation among the students themselves was also reported. However, academic tutoring received positive evaluations. In this scenario, 48.0% of students reported a negative impact on academic performance, with concerns about virus transmission and family infections being significant factors. These results underscore the need for further research to understand the true nature of remote learning outcomes and guide future educational practices. It is crucial to adequately prepare professors for distance learning and to develop effective strategies that promote student motivation and improve their academic performance in crisis situations such as the COVID-19 pandemic.

Keywords: health education; COVID-19; higher education.

RESUMO

Durante a pandemia de COVID-19, ocorreu uma mudança global para a educação remota. Este estudo investigou o impacto do ensino remoto em estudantes da área de saúde em uma universidade pública no Amazonas, Brasil. Os participantes foram alunos dos cursos de Enfermagem, Medicina e Odontologia, submetidos à aprendizagem totalmente remota. A coleta de dados foi realizada de forma online, seguida de análises estatísticas. No total, 175 estudantes participaram, representando 17,6% de Enfermagem, 20,6% de Medicina e 19,7% de Odontologia. A maioria dos participantes foi do sexo feminino (68,0%) e ingressou por meio do sistema de admissão da capital (65,1%). Considerando o impacto negativo da pandemia, 46,3% dos estudantes relataram sentir-se frequentemente prejudicados pelo ensino totalmente remoto. Segundo a percepção dos estudantes, a maioria dos professores não estava adequadamente preparada para o ensino à distância e as estratégias educacionais ativas mostraram-se ineficazes; a falta de motivação dos próprios estudantes também foi relatada. No entanto, a monitoria acadêmica recebeu avaliações positivas. Nesse cenário, 48,0% dos alunos relataram um impacto negativo no desempenho acadêmico, sendo a preocupação com a transmissão do vírus e as infecções familiares fatores significativos. Esses resultados ressaltam a necessidade de mais pesquisas para compreender a verdadeira natureza dos resultados da aprendizagem remota e orientar práticas educacionais futuras. É crucial preparar adequadamente os professores para o ensino à distância e desenvolver estratégias eficazes que promovam a motivação dos estudantes e melhorem seu desempenho acadêmico em situações de crise, como a pandemia de COVID-19.

Palavras-chave: educação em saúde; COVID-19; ensino superior.

RESUMEN

Durante la pandemia de COVID-19, se produjo un cambio global hacia la educación remota. Este estudio investigó el impacto de la enseñanza remota en estudiantes de salud en una universidad pública en Amazonas, Brasil. Los participantes fueron estudiantes de Enfermería, Medicina y Odontología, sometidos a aprendizaje completamente a distancia. Se recopilaron

datos en línea y se realizaron análisis estadísticos. Participaron 175 estudiantes en total, representando el 17,6% de Enfermería, el 20,6% de Medicina y el 19,7% de Odontología. La mayoría eran mujeres (68,0%) y se inscribieron a través del sistema de admisión de la capital (65,1%). El 46,3% de los estudiantes informaron sentirse perjudicados con frecuencia por la enseñanza remota. Según la percepción de los estudiantes, la mayoría de los profesores no estaban preparados adecuadamente para la educación a distancia y las estrategias educativas activas resultaron ineficaces; la falta de motivación de los propios estudiantes también fue reportada. Sin embargo, la tutoría académica recibió evaluaciones positivas. En este escenario, el 48,0% de los estudiantes experimentaron un impacto negativo en su rendimiento académico, siendo la preocupación por la transmisión del virus y las infecciones familiares factores significativos. Estos resultados destacan la necesidad de más investigaciones para comprender la verdadera naturaleza de los resultados del aprendizaje remoto y orientar las prácticas educativas futuras. Es crucial preparar adecuadamente a los profesores para la educación a distancia y desarrollar estrategias efectivas que promuevan la motivación y mejoren el desempeño académico en situaciones de crisis como la pandemia de COVID-19.

Palabras clave: educación en salud; COVID-19; enseñanza superior.

INTRODUCTION

Since its declaration as a pandemic by the World Health Organization (WHO) in March 2020, the global community has faced the need to confront the multifaceted challenges arising from the relentless outbreak of SARS-CoV-2. The far-reaching repercussions of this viral outbreak have reverberated worldwide, exerting lasting ramifications on the collective well-being of humanity. In addition to the profound implications in the socioeconomic and health fields, the educational sector was compelled to meet the urgent need for adaptation to ensure uninterrupted continuity of teaching (MARTINEZ; SILVA; COSTA, 2021).

In the framework of the Brazilian Constitution (1988), education is not only a fundamental right for all individuals but also a responsibility of the state (art. 205). This educational system is formalized and structured. Article 209 of the constitution guarantees that private institutions can also ensure this right, as long as they comply with general education standards established through authorization and quality assessment by public authorities, thereby acting in a complementary manner. Consequently, in response to the challenges imposed by the pandemic and to ensure educational support, both public and private educational institutions have embraced virtual platforms, enabling the continuity of learning (BARBOSA; PAULA; SANTOS, 2022; GARRIDO; GARRIDO, 2020). Digital information and communication technologies (DICT), which have been employed in various on-site and distance learning settings as well as in corporate environments for some time, have become indispensable tools for facilitating emergency remote learning (MARTINEZ; SILVA; COSTA, 2021; MISHRA; GUPTA; SHREE, 2020). Confronted with this new reality, many students and professors have

experienced disorientation and adverse effects due to the radical shift towards fully remote teaching.

According to Francis, Wormington, and Hulleman (2019), remote learning in higher education is often stigmatized as being of inferior quality compared to face-to-face learning. Additionally, Larson and Sung (2019) note that the majority of students and professors express a preference for face-to-face instruction, although some research suggests that distance learning or hybrid models may yield better performance (HODGES *et al.* 2020). In light of these perceptions, higher education institutions bear the responsibility of analyzing and designing courses that enhance academic achievement and performance, while also adhering to the legal mandates outlined in the national curriculum guidelines (NCG) (SILVA; MELO; MUYLDER, 2015).

Irrespective of the stigmas and potential preference for face-to-face instruction, remote education has emerged as an indispensable pedagogical tool during the pandemic (MARQUES; MARQUES, 2021). Educators and learners worldwide have confronted the unprecedented challenge of meaningful academic engagement within the context of digital platforms amidst the COVID-19 crisis (SRIVASTAVA *et al.* 2021). It is crucial to underscore that another significant issue persists in this landscape: educational, social, and technological inequality within the Brazilian context. Concerning the latter, at the onset of the pandemic, fewer than half of households had access to computers with internet connection (CAMACHO *et al.* 2020; MARCON, 2020; PALÚ; SCHÜTZ; MAYER, 2020). Within this framework, due consideration must be given to the mental well-being of students and professors, as it inevitably impacts the teaching and learning process (PALÚ; SCHÜTZ; MAYER, 2020). It is imperative to acknowledge that the established epidemiological situation and the rapid surge in cases and deaths during critical phases of the pandemic have engendered various disturbances. These include personal experiences of uncertainty, insecurity, anxiety, stress, and anguish in the face of the prospect of infection or the loss of a family member or friend. Such factors have contributed to adverse effects on learning outcomes and potentially influenced a negative perception of remote instruction (TELES; GOMES; VALENTIM, 2021).

The COVID-19 pandemic has intensified educational challenges both in Brazil and worldwide. In light of this, this study aimed to investigate the problems and impacts arising from the transition from face-to-face to remote teaching in students enrolled in health courses, from their own perspective. The study was conducted at a public university in the state of Amazonas, Brazil.

METHOD

Characterization, place and study population

The present study employed an observational analytical cross-sectional design, with data collection conducted remotely. Ethical approval was obtained through Certificate of Presentation for Ethical Assessment (CAAE) no. 52574021.8.0000.5016, and the research protocol received a favorable opinion from the ethics committee under no. 5,041,959. The participants in this study consisted of students enrolled in the Nursing, Medicine, and Dentistry programs at the Higher School of Health Sciences, HSHS, (Escola Superior de Ciências da Saúde, ESA) of the Amazonas State University, ASU, (Universidade do Estado do Amazonas, UEA). Specifically, students who were regularly enrolled and attended the academic semesters of 2020/01 and 2020/02 were included, encompassing the 2nd to 7th and 3rd to 8th academic terms, respectively.

In response to the requirements imposed by the pandemic, necessitating adaptations to the teaching model and academic calendar, the 2020/01 academic semester, which had started with a month of face-to-face activities, was subsequently transitioned to a fully remote format in August and October 2020. Similarly, the 2020/02 semester unfolded entirely in a remote manner from February to July 2021.

Sample and eligibility

According to the records obtained from the academic secretariat of HSHS/ASU, a total of 233 Nursing students, 383 Medicine students, and 279 Dentistry students attended and completed the academic semesters of 2020/01 and 2020/02, resulting in a combined total of 895 students. Prior to participating in the academic periods with 100% remote teaching, these students had already undergone one or more on-site academic periods.

In line with the researchers' discretion, a minimum sample size of 15% was established for each course, exclusively including students aged 18 or older. A comprehensive list of names was compiled for each course, arranged in alphabetical order, and assigned a sequential numerical identification. The participants were selected through a process of numerical randomization facilitated by *BioEstat* software, version 5.3.

Data collect

In order to obtain the minimum required number of participants for this study and mitigate potential data loss or issues, the invitation was extended to 30% of the total number of students in each course, which is double the minimum threshold set. The invitation process involved sending individualized letters to the selected participants' institutional email addresses. These letters included a project overview, eligibility criteria, and a link to access

the Free and Informed Consent Term (FICT). Upon agreeing to participate in the research by clicking "Yes", participants were able to download a copy of the informed consent and proceed to complete a semi-structured electronic data collection form. The form could only be closed after all questions were answered. Both the FICT and the electronic form were created using the *Google Forms®* tool.

The questionnaire was structured into four (4) sections. The first three sections aimed to collect information regarding the (i) participant's identification, including email, gender, age, and course; (ii) primary and secondary education background, whether in public, private, or both institutions, and (iii) mode of entry into the ASU, categorized based on two options: capital (Manaus) or interior of the state of Amazonas. The fourth section (iv) comprised 20 questions pertaining to the 100% remote teaching model, the impact of the COVID-19 pandemic on the learning process, students' learning conditions, professors' preparation, the influence of academic support, the utilization of active educational strategies in this context, remote assessments, and academic performance. Among these questions, 8 (labeled A-H) were structured with Likert scale responses. Questions A, B, and C offered response options on a frequency scale: never, rarely, occasionally, often, and very often. Questions D, E, F, and H provided agreement options: totally disagree, disagree, undecided, agree, and totally agree. Question G allowed participants to indicate their level of satisfaction: very dissatisfied, dissatisfied, indifferent, satisfied, and very satisfied (Graph 1). Data collection occurred between August and September 2021.

Data analysis

The data were organized in a descriptive univariate manner, including variable summarization and analysis of frequency distribution. The normality of dependent variables was assessed using the Kolmogorov-Smirnov test. Statistical comparisons between two independent unpaired groups were conducted using the Mann-Whitney nonparametric test, while comparisons among more than two groups were performed using the Kruskal-Wallis test. The Mann-Whitney nonparametric test was employed to analyze two independent unpaired groups, while the Kruskal-Wallis test was utilized for analyzing more than two groups. All statistical analyses were carried out using *IBM® SPSS® Statistics* version 26, with a 95% confidence interval. Graphs were generated using *OriginPro* version 2019b from OriginLab Corporation©.

RESULTS

Those who agreed to participate in this study and completed the questionnaires included 41 Nursing students (17.6% of the total of 233), 79 Medicine students (20.6% of the total of 383), and 55 Dentistry students (19.7% of the total of 279), resulting in a total of 175 students. The participants had a mean age of 23.5 ± 3.5, with the majority (65.1%) being admitted through the capital's admission system and belonging to the medical course (45.1%). Additionally,

68.0% of the participants were female. The majority of students completed both elementary and high school within the public education system (Table 1).

Table 1 – Constitution of the evaluated sample.

Groups	*n* (%)	Groups	*n* (%)
Genre		ElementarySchool	
Male	56 (32,0)	*100% public*	83 (47,4)
Feminine	119 (68,0)	*Public/Private*	28 (16,0)
Age	23,5±3,5	*100% private*	64 (36,6)
Course		High school	
Nursing	41 (23,4)	*100% public*	119 (68,0)
Medicine	79 (45,1)	*Public/Private*	5 (2,9)
Dentistry	55 (31,4)	*100% private*	51 (29,1)
Admission to ASU			
Capital	114 (65,1)		
Interior	61 (34,9)		

Note: Results expressed in absolute (n) and relative (%) frequency; mean age and standard deviation (x̄±SD).

Source: Prepared by the authors, 2022.

Graph 1 – Student responses about 100% remote teaching during the COVID-19 pandemic.
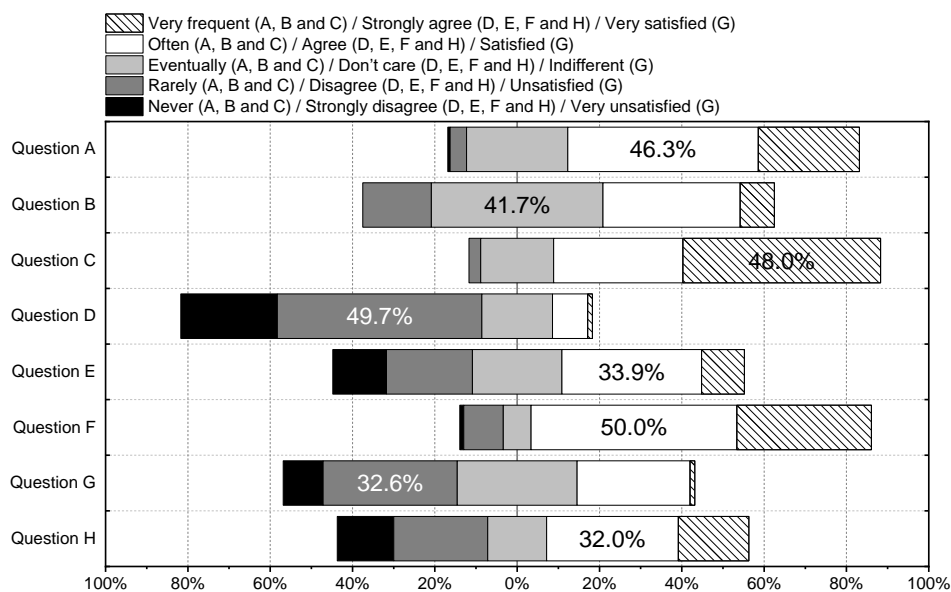
Note: Question A: (n=175) To what extent were you adversely affected by the fully remote teaching modality, disregarding the pandemic? Question B: (n=12) Did the internet chip provided by top management sufficiently meet your academic needs? Question C: (n=175) Did the pandemic have a negative impact on your academic learning during the fully remote teaching modality? Question D: (n=175) Were your professors adequately prepared for the fully remote teaching modality? Question E: (n=115) Did active methodologies significantly contribute to your learning? Question F: (n=104) Do you consider the involvement of academic tutors essential for disciplinary progress and satisfactory learning? Question G: (n=175) How satisfied are you with remote assessments, regardless of personal sentiments towards professors, disciplines, or content? Question H: (n=175) Excluding the pandemic

and associated challenges, do you consider fully remote teaching an effective learning tool for certain subjects in your course?

Source: prepared by the authors, 2022.

Considering the shift to the 100% remote teaching modality, without taking into account the influence of the pandemic, a majority of students (46.3%) reported feeling "often" harmed (Graph 1 – Question A). Among those who selected "often" and "very often" as their responses, the main reasons for feeling harmed were investigated. The most common reason identified was the lack of motivation combined with a lower frequency of studies (36.6%) compared to face-to-face classes. Additionally, the unpreparedness of many professors (28.7%) in delivering remote instruction was also cited (Chart 1).

Frame 1 – Responses from students who felt harmed by fully remote teaching in a scenario in which the pandemic was completely ignored.

Answers	%
I don't have the same motivation and frequency of studies that I had in face-to-face classes.	36.6
All or most professors did not create/develop educational measures/strategies that facilitated learning in this new teaching modality.	28.7
I have home internet access, but it is of poor quality.	14.3
I have to share my home computer with other family members/residents.	9.3
Lack of practical classes (basic and clinical cycle).	3.6
I don't have a personal computer.	3.2
Difficulty concentrating at home (lack of ambiance, noise, distractions, family problems etc.).	1.8
I don't have internet access at my home.	1.1
Too much work by professors.	0.7
Personal problems with professors.	0.7
Total	100

Source: prepared by the authors, 2022.

In this study, a total of 12 students (6.9% of the total sample of 175) reported using internet chips provided by the upper management of ASU for their smartphones. Among these students, five (41.7%) stated that the chips only occasionally met their academic demands (Graph 1 – Question B).

Additionally, 48.0% of the participants reported a frequent negative impact of the pandemic on their academic performance (Graph 1 – Question C). For those who responded "often" or "very often" to this question, further inquiries were made to identify the primary reasons for this negative impact on learning and academic performance. The most common responses included concerns about protective measures and the fear of contracting the Coronavirus (35.4%), as well as cases of family members being infected (21.9%) (Frame 2).

Frame 2 – Responses from students who felt harmed in the learning process in a scenario in which the COVID-19 pandemic was considered as the only cause.

Answers	%
The concern with protection measures and fear of contamination, by myself, family, and friends/colleagues, interfered with my learning/academic performance.	35.4
There were case(s) of COVID among my family members, which interfered with my learning/academic performance.	21.9
I had COVID-19 and it interfered with my learning/academic performance.	12.1
There were case(s) of COVID among my friends/colleagues, which interfered with my learning/academic performance.	12.1
There were death(s) due to COVID among my family members, which interfered with my learning/academic performance.	10.4
There were death(s) due to COVID among my friends/colleagues, which interfered with my learning/academic performance.	6.4
Pictures of mental disorders.	1.7
Total	100

Source: prepared by the authors, 2022.

When asked about professors' preparation for fully remote learning (Graph 1 – Question D), the majority of students (49.7%) disagreed with the level of preparation. This result reflects solely the students' perception regarding the professors' preparedness for remote teaching.

Regarding the utilization of active educational methodologies, 65.7% of students reported that these strategies were employed, albeit by less than 50% of professors in each academic semester and for up to 25% of the subject's content (Graph 2). When questioned about the significant contribution of these active methodologies to their learning, a slight majority (33.9%) agreed (Graph 1 – Question E). No significant differences were found between the number of active methodologies used in the subjects (Graph 2 – C) and their evaluation (Graph 1 – Question E) when analyzed using the Kruskal-Wallis test (data not shown).

Graph 2 – Use of active methodologies.
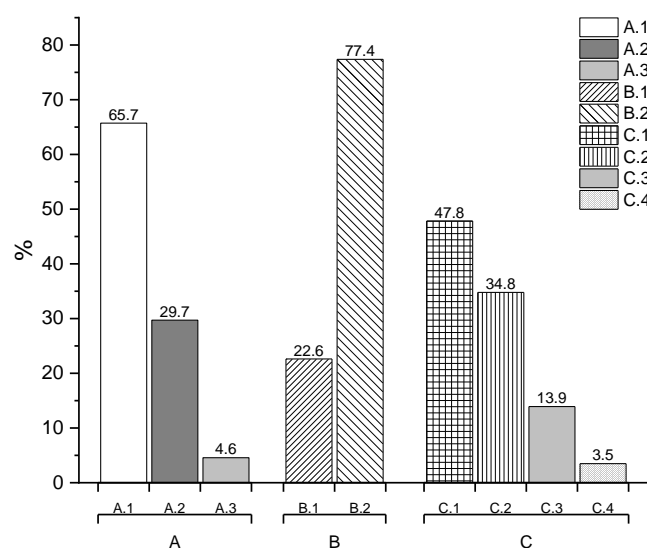
Note: Use of active methodologies in the academic semester (A): yes (A.1); no (A.2); does not know how to inform (A.3). More than 50% of professors used (B.1); less than 50% used it (B.2). Active methodologies (C) were used for up to 25% (C.1), 50% (C.2), 75% (C.3) and 100% (C.4) of the course content.
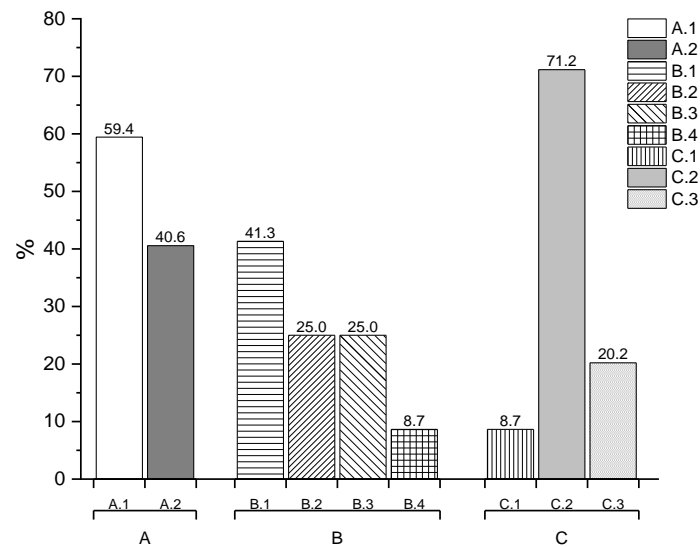
Source: prepared by the authors, 2022.

In terms of academic tutoring, the majority (59.4%) of the students reported that the theoretical and theoretical-practical subjects, which do not constitute a mandatory curricular internship, contained the presence of tutors (Graph 3 – A). However, the distribution of these tutors, in the subjects that make up the curriculum of each course, is variable (Graph 3 – B). Regarding the participation of tutors in the subjects, 71.2% of the students reported that only some of them were, in fact, active/participating (Graph 3 – C). Also, when asked whether the performance of the tutors is essential for the smooth running of the discipline and for a satisfactory learning process, the majority (50.0%) reported "agree" (Graph 1 – Question F). Significant differences were found between the number of subjects in the academic semester, which had the presence of tutors and the evaluative responses about them (Graph 1 – Question F) (Kruskal-Wallis X2(3) = 13.363; p < 0, 05). Bonferroni's post hoc analysis showed a positive evaluation of academic tutoring in academic semesters where up to 75% and up to 100% of the subjects had the presence of tutors, when compared to those where tutoring took place for up to 25% of the subjects.

In another question disregarding personal sentiments towards professors, disciplines, or content, a slight majority (32.6%) of students expressed their dissatisfaction with remote assessments (Graph 1 – Question G). However, when considering a scenario in which the pandemic and its associated challenges were disregarded, a slight majority (32.0%) of students

agreed with the possibility of utilizing remote teaching for specific subjects in their courses (Graph 1 – Question H).

Graph 3 – Academic tutoring.

Note: Existence of tutors in the subjects of the academic semesters (A): yes (A.1); no (A.2). Up to 25% (B.1), or 50% (B.2), or 75% (B.3), or 100% (B.4) of the subjects had the presence of tutors. Active tutors (C): none (C.1); only some of them (C.2); all of them (C.3).

Source: prepared by the authors, 2022.

No significant differences were found between the categories of gender and method of accessing the ASU in relation to the structured Likert scale responses for questions A, C, D, G, and H, as determined by the Mann-Whitney test (data not shown). Similarly, the influence of the categorical variables of course and place of completion of primary and secondary education on these responses was not observed when analyzed using the Kruskal-Wallis test (data not shown). In terms of academic performance coefficients, a majority of 142 students (81.1%) reported an increase in their coefficients after the academic semesters 2020/01 and 2020/02.

DISCUSSIONS

The ASU is committed to fostering diversity within its student community. Approximately 80% of the available slots are designated for individuals who have completed high school in the state of Amazonas. Within this percentage, there are reserved quotas for students from public schools, indigenous communities, and individuals with disabilities. The remaining 20% of slots are open to candidates from other Brazilian states, regardless of their educational background. In this context, ensuring equitable and high-quality education is already a

significant challenge. This challenge was further heightened with the introduction of remote teaching during periods of social isolation.

The lack of interaction among students, professors, and the academic environment significantly contributes to students' lack of motivation and infrequent studying. Oliveira (2020) asserts that learning is a synaptic event that occurs during biological maturation and interaction with the environment. However, it is essential to acknowledge the profound impact of the pandemic on this process, rendering remote teaching more arduous and discouraging (DANIEL, 2020). Consequently, concrete and definitive results must be contextualized within the remote teaching framework.

The current reality has imposed on professors the necessity to acquaint themselves with and utilize various educational tools and platforms, many of which are unfamiliar to the majority. At ASU, the institution's top management initiated the adoption of the VLE-ASU platform, a virtual learning environment based on Moodle (Modular Object-Oriented Dynamic Learning Environment), for the entire academic community. Professors were provided with a mini-course comprising video lessons to facilitate the use of the platform. In contrast, HSHS saw minimal adoption of the VLE-ASU platform, with less than 40 professors out of 313 utilizing it by the end of 2019. However, the period of social isolation necessitated its universal adoption.

Professors' unpreparedness, assessed according to the students' perception, can be attributed to the lack of knowledge, experience, and difficulty in using these educational resources, added to the professionals' lack of motivation. Silva *et al.* (2021), Moustakas and Robrade (2022) reported that the use of online tools for distance learning presented considerable challenges during social isolation, requiring prior technological knowledge from both professors and students, in addition to access to materials and internet resources that are often limited.

To enhance remote teaching, comprehensive support systems must be implemented, including training programs and resource provision for educators. Policymakers and educational institutions should address technological accessibility, availability of material resources, and provide pedagogical support during emergency situations (LARSARI *et al.*, 2023). Lessons from the COVID-19 pandemic should inform the establishment of clear and efficient contingency plans, ensuring educators and students have access to necessary technological resources. Continuous training is crucial for educators to effectively utilize available tools and platforms, while partnerships with technology companies and service providers ensure access to quality educational resources, promoting collaboration among institutions, governments, and the private sector to provide comprehensive support.

The effectiveness of active methodologies in the given context was found to be insignificant. According to Dosea *et al.* (2020), several limitations in the non-face-to-face modality hinder the implementation of active methodologies, including issues with internet connectivity,

study environments, and difficulties with online platforms. Furthermore, it is worth considering that the lack of interactive dynamics, group work, and appropriate physical environments may have also influenced the outcomes. Torda, Velan, and Perkovic (2020) propose that integrating online active learning activities, such as adaptive tutorials, discussions, and reflections, can lead to more meaningful educational experiences for students compared to traditional methods.

Within the scope of this study, it is crucial to address the issue of the digital divide. The 2020 ICT Household Survey provides valuable insights into this matter. The survey revealed that approximately 61.8 million households in Brazil, representing 83% of the total, had some form of Internet access. This marked a significant increase of 12 percentage points compared to the previous year (71% in 2019). Moreover, the survey indicated a rise in the proportion of households with a computer, reaching 45% in 2020. However, it is important to highlight that the distribution of these resources is not uniform across the country, with the North and Northeast regions experiencing lower rates of Internet access compared to other regions.

Building upon the findings, it becomes evident that addressing the digital divide is a pressing concern in Brazil. The unequal distribution of Internet access and computer availability across regions, particularly in the North and Northeast, calls for targeted interventions to bridge this gap (GABARDO *et al.*, 2023). The implications of this disparity are far-reaching, as limited access to digital resources can hinder educational opportunities and hinder social and economic progress in these areas. To promote inclusive development, it is crucial to implement comprehensive strategies that address infrastructure limitations, promote digital literacy, and ensure equal access to educational resources and opportunities for individuals in underserved regions (CAVALCANTE *et al.*, 2021; GABARDO *et al.*, 2023). By prioritizing efforts to reduce the digital divide, we can foster a more equitable and inclusive society, empowering individuals from all corners of the country to thrive in the digital era.

The provision of internet chips to students facing social vulnerability has been recognized as a temporary measure. Relying on smartphones as the primary device for remote learning is a stopgap solution, particularly considering the limited signal coverage of mobile operators in the Amazonas region. Gaur *et al.* (2020) emphasizes various obstacles that hinder effective remote learning, including the absence of a reliable and robust network infrastructure encompassing hardware, software, and network bandwidth, as well as the availability of online platforms that align with the planned curriculum. Previous studies have also identified network instability as a significant source of dissatisfaction in emergency education (EUN SHIM; YI LEE, 2020; ARJA *et al.*, 2022). This study reveals that network-related issues such as signal absence, weak signal strength, and instability are significant factors contributing to the challenges of remote teaching. Moreover, additional difficulties were reported, including the shared use of a single computer within households, financial constraints that limit the

payment of monthly internet and electricity bills, and the substantial internet consumption per class, all of which compound the obstacles faced by both students and educators.

In this study, the influence of academic tutoring on student learning was found to have a significantly positive impact, consistent with the findings of González *et al.* (2022) and Oliveira *et al.* (2021). Notably, HSHS stands out as the pioneering unit within ASU for establishing a local coordination of special programs, encompassing both the scientific initiation and tutoring programs. However, to ensure an equitable distribution of tutors, it is crucial to implement efficiency measures between this coordination and the course coordinators. Moreover, professors play a vital role in managing discipline content and implementing strategies that enhance tutor participation and interaction. Marques *et al.* (2021), examining the impact of academic tutoring during the pandemic, also concluded that despite the challenges, tutors effectively delivered the content in a concise and thought-provoking manner, fostering learning and promoting academic enrichment among students and tutors.

The dissatisfaction expressed towards remote assessments may stem from the inherent contrast between traditional somatic assessments, which are customary at, and the virtual setting in which they took place. Within this context, the potential for consultations or group assessments should not be disregarded, as it can lead to feelings of guilt regarding active learning or doubts about the efficacy of remote teaching. It was reported that some professors required students to keep their cameras turned on during assessments, which likely intensified discomfort and subsequently increased dissatisfaction. Nonetheless, this remains a highly debated topic in the realm of remote teaching. In light of these circumstances, Queiroz-Neto *et al.* (2022) highlights the necessity of implementing formative assessments as a viable strategy with significant outcomes.

Even amidst all the challenges, difficulties, and discontentment associated with fully remote teaching in a pandemic scenario, the grade point average (GPA) of the majority of students increased during this period. This observation is consistent with the findings of Gonzalez *et al.* (2020) and Iglesias-Pradas *et al.* (2021). A comprehensive analysis would suggest that distance learning has led to an improvement in learning outcomes. However, considering the extensive discussion thus far, the question remains: could this potentially represent false learning outcomes? As previously described, we cannot assert concrete and definitive results regarding distance learning without disregarding the context and urgency in which it was implemented. The observed increase in academic GPA performance among students during the period of fully remote teaching in a pandemic scenario presents a paradoxical situation. On one hand, it suggests that distance learning has yielded positive results, as supported by previous studies. However, it is important to exercise caution and critically examine whether these improved outcomes may be influenced by factors other than effective learning. The unique circumstances of emergency remote teaching necessitated rapid adaptation, and students may have employed different strategies to cope with the situation.

Thus, it becomes imperative to conduct further research that delves deeper into the nuances of remote learning and investigates the potential impact of contextual factors on learning outcomes. This will enable a more comprehensive understanding of the true nature of these results and inform future educational practices.

It is speculated that students' decisions regarding the possibility of utilizing remote teaching for certain subjects in their respective courses may be motivated by a desire to reduce the burden of mandatory class hours. Gaur *et al.* (2020) emphasizes the potential consequences of a lack of practical training during the pre-clinical years, which can pose significant challenges for students' preparedness in the clinical phases. The integration of remote teaching for specific components of health-related courses is already being implemented in many universities, particularly in the private sector.

Evidence supporting a combination of remote and traditional education approaches, which align with students' expectations of interactivity, flexibility, and future outlook, continues to emerge on a daily basis, as noted by Rose (2020), Torda, Velan, and Perkovic (2020), and Miguel *et al.* (2021).

FINAL CONSIDERATIONS

Our study identified difficulties and challenges associated with the remote teaching modality and the learning process, exacerbated by the context of the COVID-19 pandemic and its consequences. According to the students' reports, it was observed that the majority of HSHS/ASU professors were not adequately prepared to deal with this scenario. Active educational strategies, employed in the remote environment, were found to be ineffective. On the other hand, academic tutoring received the only positive evaluation during this period. Additionally, there was an interest in exploring the potential of remote teaching for specific curricular components in the field of health.

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