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The use of the flipped classroom as a teaching-learning strategy in emergency remote education in Speech, Language and Hearing Sciences

O uso do *flipped classroom* como estratégia de ensino-aprendizagem no ensino remoto emergencial em Fonoaudiologia

El uso del aula invertida como estrategia de enseñanza-aprendizaje en educación remota de emergência en Fonoaudiología

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Abstract

Introduction: Emergency remote education has been adopted in Brazil due to the SARS-CoV-2 pandemic. Among the pedagogical possibilities, the flipped classroom stands out. **Objective:** To describe the experience report of the flipped classroom as a teaching-learning strategy in a course of the Speech, Language and Hearing Sciences**. Method:** Optional module of an undergraduate course in Speech, Language and Hearing Sciences was offered remotely for five weeks, adopting the flipped classroom.

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CPHARC and ACG: responsible for the conceptualization of the research, elaboration and execution of activities, data collection, data interpretation, elaboration, and approval of the final version of the manuscript.
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Digital platforms were used to provide content for asynchronous classes. The synchronous sessions, carried out on the Google Meet platform, were performed through simulated cases discussed orally and playful activities. At the end of the course, a Portfolio was delivered (as an evaluation of the module), and a student self-assessment was completed. There was a virtual discussion, among the teachers, of the results obtained. **Results:** A total of 19 participants. The teachers evaluated the satisfactory and pertinent method because of the pandemic. The previous reading of the material provided allowed the knowledge of the content. In the synchronous meetings, there was a reflection of the simulated cases and the elucidation of doubts. As negative points, the course's duration, the difficulty of the group's notion, and the exposition of ideas stood out. As positive, the playful strategies that motivated the adhesion in the module's proposal. The average of evaluative activities and self-assessment were close, showing similar perceptions between teachers and students. **Conclusion:** The flipped classroom was an efficient strategy for remote academic activities due to its easy applicability and motivational factor.

Keywords: Speech, Language and Hearing Sciences; Education, Higher; Education, Distance; Pandemics; Coronavirus Infections.

Resumo

Introdução: O ensino remoto de emergência tem sido adotado no Brasil devido à pandemia do SARS-CoV-2. Dentre as possibilidades pedagógicas, destaca-se o *flipped classroom*. **Objetivo:** Descrever relato de experiência do *flipped classroom* como estratégia de ensino-aprendizagem em Fonoaudiologia. **Método:** Módulo optativo de um curso de graduação em Fonoaudiologia foi ofertado remotamente, por cinco semanas, adotando-se o *flipped classroom*. Foram utilizadas plataformas digitais para disponibilização de conteúdo das aulas assíncronas. As síncronas, que foram realizadas na plataforma *Google Meet,* foram executadas por meio de casos simulados discutidos oralmente e atividades lúdicas. Ao final do curso houve a entrega de um Portfólio (como avaliação do módulo) e o preenchimento de autoavaliação discente. Houve discussão virtual, entre as docentes, dos resultados obtidos. **Resultados:** Totalizaram 19 participantes. As docentes avaliaram o método satisfatório e pertinente frente ao contexto pandêmico. A leitura prévia do material disponibilizado permitiu o conhecimento do conteúdo. Nos encontros síncronos houve a reflexão dos casos simulados e a elucidação de dúvidas. Como pontos negativos destacaram-se a duração do curso, a dificuldade de noção de grupo e de exposição de ideias. Como positivos, as estratégias lúdicas que motivaram a adesão na proposta do módulo. A média das atividades avaliativas e da autoavaliação foram próximas, evidenciando percepções similares entre docentes e discentes. **Conclusão**: A utilização do *flipped classroom* mostrou-se como uma estratégia eficiente para as atividades acadêmicas remotas pela sua fácil aplicabilidade e pelo seu fator motivacional.

Palavras-chave: Fonoaudiologia; Ensino superior; Educação a Distância; Pandemias; Infecções por Coronavírus.

Resumen

Introducción: La educación remota de emergencia ha sido adoptada en Brasil debido a la pandemia SARS-CoV-2. Entre las posibilidades pedagógicas destaca el aula invertida. **Objetivo:** Describir el relato de experiencia del aula invertida como estrategia de enseñanza-aprendizaje en Logopedia. Método: Módulo opcional de un curso de pregrado en Logopedia se ofreció de forma remota, durante cinco semanas, adoptando el aula invertida. Se utilizaron plataformas digitales para proporcionar contenido para clases asincrónicas. Las sesiones sincrónicas, que se llevaron a cabo en la plataforma Google Meet, se realizaron a través de casos simulados discutidos oralmente y actividades lúdicas. Al final del curso se entregó un Portafolio (como evaluación del módulo) y se completó una autoevaluación del alumno. Hubo una discusión virtual, entre los profesores, de los resultados obtenidos. **Resultados:** Hubo un total de 19 participantes. Los docentes evaluaron el método satisfactorio y pertinente en vista del contexto pandémico. La lectura previa del material proporcionado permitió el conocimiento del contenido. En las reuniones sincrónicas, hubo un reflejo de los casos simulados y el esclarecimiento de dudas. Como puntos negativos, se destacaron la duración del curso, la dificultad de noción de grupo y la exposición de

ideas. Como positivo, las estrategias lúdicas que motivaron la adhesión en la propuesta del módulo. El promedio de actividades evaluativas y de autoevaluación fue cercano, mostrando percepciones similares entre docentes y estudiantes. **Conclusión:** El uso del aula invertida demostró ser una estrategia eficiente para actividades académicas remotas debido a su fácil aplicabilidad y factor motivacional.

Palabras clave: Fonoaudiología; Educación Superior; Educación a Distancia; Pandemias; Infecciones por Coronavírus.

Introduction

Emergency remote teaching is a transitory change that is being used as an alternative to face-to-face or hybrid teaching due to crises and the need to suspend face-to-face academic activities after the Covid-19 pandemic outbreak[1,2]. Changes needed to be made, such as courses offered in a virtual environment, requiring the use of different strategies, among which the use of an active methodology called flipped classroom[3-4].

Classroom flipping encompasses several pedagogical concepts, such as active and collaborative learning, autonomy, meaningful learning, and remote learning[5]. Although there is no rigid method on how to use this strategy, this nomenclature is used when there is prior availability of some material for study by the teacher and, at another time, after the individual study sessions of the students, the performance of a synchronous meeting for discussing the course's subjects and teamwork. The four pillars of this strategy are anchored: 1) in the flexibility to use different ways to promote the teaching-learning process, 2) in fostering a learning culture, 3) in the intentionality of the proposals made by the teacher, and 4) in frequent evaluation and feedback regarding the performance of students[5].

The flipped classroom model can be used in the various information and communication technologies (ICTs) platforms that are, nowadays, essential for the continuity of academic activities. Thus, there is an expansion of available resources for learning, favoring the application of pedagogical strategies that meet different learning styles, as well as the incorporation of active methodologies that encourage greater student participation in their educational process[6].

Given this new context, discussing forms of remote learning that promote improvements in the performance of students[7] and that do not require modification of pedagogical curricula[5] are imperative in the current moment of the SARS-CoV-2 pandemic. Thus, the objective of this work was to describe the experience report of the use of the flipped classroom model as a teaching-learning strategy in emergency remote education.

Methods

Qualitative and descriptive research that based its results on the description of an optional remote teaching module (Special Topics in Professional Ethics) of the undergraduate course in Speech, Language and Hearing Sciences at the Federal University of Sergipe, in which the active flipped classroom methodology was used. The module was offered from June 22 to July 20, 2020, therefore during the period of the SARS-CoV-2 pandemic. The meetings took place on Mondays, synchronously, and on Wednesdays, asynchronously, in which materials to study the next class' subjects were made available.

Participants were invited by email, receiving an explanatory letter for the research. If the professors agreed to make the self-assessment results available, they received a link to read and sign the Free and Informed Consent Form (FICF), prepared by Google Forms. It should be noted that the project was previously designed and approved by the Research Ethics Committee (Ordinance 2377894 – CAAE 33665414.6.0000.5546).

Several virtual platforms were used for the classes and for the provision of content to facilitate access and communication between teachers and students. The integrated academic activities management system (SIGAA) was used to manage teaching, research, and outreach activities in educational institutions, adding resources such as chats, forums, files, spreadsheets (attendance, notes, activities/tasks), news board, teaching plan, and others; Zoom, for recording the first asynchronous class; Google schedules for sending the link of the synchronous virtual classes, the email (for the clarification of doubts and/or the sending of files

due to instabilities of the institutional platform); and WhatsApp (for faster communication with students and teachers, quick solutions regarding access difficulties, sending links, and so on). PowerPoint software from the Office package (Microsoft Office®) was used to elucidate the classes with visual and graphic materials. Google Meet was used for synchronous meetings and the classes were recorded for later consultation with interested parties or students who missed the synchronous meetings.

Initially, the professors prepared the course plan, defining the content to be worked on. Then, the teachers elaborated seven problem situations; selected scientific articles, instructional videos, and websites for students' consultations; always discussing the evaluation process and creating playful strategies to motivate students in the module.

Chart 1 contains the description of the pedagogical work developed during the module, evidencing the day of classes, the themes, strategies, and motivating playful activities (which could provide greater interpersonal interaction and cause, in the participants, a feeling of happiness and relaxation) - selected from the professors' previous experiences in teaching practices.

Chart 1. Description of the pedagogical work developed in the module by day, theme, and strategies used.

Class characterization (number, type, and theme)	Strategies
Class 1 Asynchronous virtual History of Speech, Language and Hearing Sciences and Law 6965	1. Opening of the module's Forum and WhatsApp group and its use during the week to clear doubts and make materials available, if necessary; 2. Announcing on SIGAA the beginning of activities, guidance on the teaching method adopted, the days of synchronous and asynchronous meetings, the construction of the Portfolio, and the evaluation criteria; 3. Uploading the slideshow presentations on SIGAA; 4. Availability to students of the recorded class on the Zoom platform; 5. Text by Oliveira (2018)8 uploaded to SIGAA for further reading on the topic of class 1; 6. Request and explanation of the evaluation activities to be organized in a Portfolio: 1) Elaboration of a timeline with the historical landmarks of the profession and 2) Projection of the professional future with the inclusion of ethical and legal aspects for such achievement. Deadline: the last day of the module, and the Portfolio can be sent at any time and re-elaborated if the student desires to, and; 7. Submission of the Code of Ethics9 for prior reading.
Class 2 Synchronous virtual Speech, Language and Hearing Sciences Code of Ethics	1. Prior orientation so that everyone was dressed in character (theme: São João) 2. Registering the virtual meeting on Google Calendar and sending the class invitation via Google Meet; 3. Beginning the class by answering questions from the previous class; 4. Presentation of students and teachers using the strategy: "Say your name, Cycle you are taking and what you like most in São João" (playful activity). 5. Preparation, presentation, and discussion of two problem situations involving the class subject using Google Meet; 6. Using WhatsApp as a means of communication for those who were having difficulties accessing Google Meet so that the class link could be resent; 7. Using the Google Meet chat to clear doubts during class for those who did not feel comfortable enough to ask questions; 8. Presentation of the institutional video "Especial de São João: nosso som" at the end of the class; 9. Availability of slides used in the class and news at SIGAA with guidelines for the next class, with the link to the Federal Council of Speech, Language and Hearing Sciences (CFFª) to search for ordinances and resolutions to be discussed during the next class; 10. Deposit of two materials for further reading in the module materials folder at SIGAA 10,11

Class characterization (number, type, and theme)	Strategies
Class 3 Synchronous virtual	1. Registering the virtual meeting on Google Calendar and sending the class invitation via Google Meet; 2. Beginning the class by answering questions from the previous class; 3. Preparation, presentation, and discussion of two problem situations involving the class subject using Google Meet; 4. Using WhatsApp as a means of communication for those who were having difficulties accessing Google Meet so that the class link could be resent; 5. At the end of the class, performance of the dynamic "Verbal memory of absurdities" (playful activity). The dynamic consisted in the emission of a sentence by one of the participants and, in this sentence, it should contain a strange fact (absurd), and the next participant should repeat the previous sentence increasing it, also inserting nonsense, until everyone had exposed absurd verbal memories. 6. Availability of slides used in the class and news on SIGAA with guidelines for the next class; 7. Deposit of material for further reading in the module materials folder at SIGAA12.
Class 4 Synchronous virtual Telehealth in Speech, Language and Hearing Sciences	1. Registering the virtual meeting on Google Calendar and sending the class invitation via Google Meet; 2. Beginning the class by answering questions from the previous class; 3. Preparation, presentation, and discussion of two problem situations involving the class subject using Google Meet; 4. Using WhatsApp as a means of communication for those who were having difficulties accessing Google Meet so that the class link could be resent; 5. Availability of slides used in the class and news on SIGAA with guidelines for the next class; 6. Deposit of material for further reading in the module materials folder at SIGAA13 and; 7. Use of the SIGAA forum to answer questions. 8. It was suggested that everyone wore a piece of white clothing, to symbolize hope, and relaxation exercises were performed with the song "Simples desejo" 14 (playful activity).
Class 5 Asynchronous virtual Biosafety in Speech, Language and Hearing Sciences	1. Sending of slideshow presentations indicating hyperlinks for videos on the subject of the class; 2. Use of the SIGAA forum to answer questions; 3. Preparation, submission, and receipt of the module's self-assessment form and; 4. Final feedback of the module, via SIGAA, of the evaluations.

The making of a portfolio was designated as an evaluative activity, consisting of two exercises. The first, in which students should make a timeline with the main milestones in the history of the profession and the second, with the idealization of the professional future, to enable the student to both search for legal ethical assumptions for exercising the profession, and to be able to glimpse themselves in the future, with dreams coming true, inspiring confidence and hope but also complicated feelings due to the current Pandemic. Due to the concept of continuous assessment, the students were free to redo the portfolio as many times as they were interested and willing.

To complete the module, the professors created a student self-assessment form by Google Forms, available online, comprising strengths and weaknesses regarding the content, the group, themselves, the teachers, as well as the attribution of a self-assessment grade, explaining why such evaluation was chosen. The professors also registered their perceptions and, later, discussed (via Google Meet) the results obtained, writing down the main ones in a separate sheet.

22 students attended the module, however, the sample of this study consisted of 19 participants, 15 (88.2%) female, and two (11.8%) male, with an average age of 20.4 ± 1.9 years old (with a minimum of 19 and a maximum of 26 years old) and two teachers, aged 50 and 57 years old.

The number of students was not equal to the total number of enrollments since, as an inclusion factor, a student would need to have at least 75% of presence in synchronous meetings, performing the evaluation activities, and signing the free and informed consent form (FICF).

The subjects were identified with the capital letter "S" followed by Arabic numerals, to preserve anonymity.

Results

The professors proposing the optional module in Speech, Language and Hearing Sciences perceived, through the synchronous meetings, high adherence of students in the module, both by their frequency and by the discussions held in the simulated cases. As for strengths, they reported the playful activities and previous readings, by the students, of the texts and materials made available on digital platforms. As negative points, the quality of the internet, not always good (S19), and the need to create different modes of communication, causing "a lot of tiredness", according to S18. In general, they said that the flipped classroom model was adequate for the purpose and that the inclusion of recreational activities was a distinguishing feature of the module, which was quite opportune for the occasion. Both concluded that the method was satisfactory for the purpose and relevant to the current pandemic context.

The results of the students' self-assessment were subdivided into seven parts: 1) strengths and weaknesses of the module's contents, 2) group assessment, 3) professor assessment, 4) analysis of evaluative activities, 5) performance self-assessment, 6) evaluation of access to the virtual module, and, lastly, 7) improvement suggestions.

The first part, related to the **content of the module**, according to the responsible professors, was carried out satisfactorily, as previously planned. This perception was also evidenced by the testimonies of the students, as shown below.

> "Knowledge about resolutions and regulations regarding the rights and duties of the speech therapist" (S1).
>
> "Constant communication. The exchange of information. And especially the way the teachers conceived the classes, a light, dynamic, and knowledge--filled meeting" (S8).
>
> "Having presented the topics before helped the students assimilate more clearly what was said by the teachers in the classes. Another strong point was the case examples on the slides, making it possible for us to apply what we had read before. Another important point was the cases of experiences of the teachers themselves, so, in addition to better understanding the practical content, it was also relevant as we laughed, relaxing after classes" (S9).
>
> "The course was conducted covering themes with easy-to-understand examples" (S14).

Therefore, one can confirm that the previous asynchronous readings allowed grasping the ethical-legal aspects of the profession and the synchronous meetings helped their understanding as they were discussed by the group.

As for the negative points related to the content, the majority (n=16, 88.89%) reported that there was no negative aspect and two participants reported the short time to work on the subjects studied (S5 and S17).

Based on the assessment of the **group's strengths and weaknesses** (second item on the self-assessment form), the majority (n=17, 94.4%) attributed positive aspects such as participation (S2, S3, S10-12, S14, S15, and S17), dialogue (S2, S10, and S14), respect (S1 and S8), and interaction (S2 and S5). It is also important to highlight two statements:

> "Quick answers via the chat **[chat – insertion of the authors]**, so that we did not interrupt the teachers' speech and, when possible, one of the teachers read the chat" (S9).
>
> "The group made an effort to meet the module's requirements, reading the materials available in advance, with the presence of virtually 100% of the students" (S17).

Four participants mentioned as negative points: the feeling that there is no configuration of a group (S16) and that some students did not verbalize their participation (S3, S10, and S17).

The **evaluation of the professors**, by the students, the third item of the student evaluation, revealed a 100% satisfied sample, as some of the statements transcribed below show.

> "They were very didactic, always available to answer questions, and very charismatic. They always prepared an interesting class for us - I loved it" (S3).
>
> "They are very funny, thus making classes easier" (S13).
>
> "They were perfect. The examples, the situations, the dynamics in the room, it was perfect" (S14).
>
> "Good explanations, didactic and comprehensive classes, and excellent teachers" (S15)

Still regarding this item, the playful activities facilitated the perception of a pleasant module and this aspect received a good evaluation by the participants.

As for the fourth item (**self-assessment**), 100% of the participants reported ease and support regarding the evaluative proposal of the module, with the

statements being in line with the results obtained, considering that the average score of the Portfolios was 8.3 (± 2, 47), close to the self-assessment grade given by the student, with an average self-assessment of 8.84 (± 1.01), evidencing similar perceptions between teachers and students.

Regarding the **performance self-assessment** (fifth item on the scorecard), the factors assessed positively in the module were, in descending order: motivation, understood as diligence, self-discipline, willpower, and availability (S3, S5-7, S10, S11, S14, S17); concentration (ability to pay attention to academic activities: S3, S9, S10 and S14); selection of main ideas (S2, S10, S15 and S16); information processing, understood as the ability to use different forms of language to understand a given subject, reported by S1, S13 and S14 and others, such as punctuality (S4) and "the learning process, conceived in the best way possible" (S8).

The negative points related to the performance were the difficulties to express thoughts or ideas orally (S1-3, S11, S15), shyness (S8 and S15); the use of technological resources (S12, S14, S17 and S18); hours of study, considered as reduced (S9 and S15); the study of the subjects, analyzed as dense by S5; and the discouragement to study during the pandemic. Besides, personal problems also interfered in the student's performance, according to S16.

The sixth item concerned accessibility. Thus, regarding the **number of accesses** per individual in the sample in the teaching module available at SIGAA, students accessed the module on average 26.4 ± 17.6 times, with a median of 23 accesses. The participant with less access performed it ten times and the one with greater access, 76 times. Teachers accessed between 22 and 26 times. According to the testimonies given in the synchronous meetings, the internet was not always of good quality, making it necessary for them to try, at another time, to access digital platforms.

The **suggestions** listed by the participants were related to the offers of other optional modules carried out by the same dynamic (S6 and S11) and to greater teacher training in the use of different technological tools in remote higher education.

Discussion

The flipped classroom method as a teaching-learning process centered on the student and his/her interaction with group 5 was used in this study for a relatively small undergraduate remote class, but it is a method that can be used in face-to-face academic activities and with classes with a large number of students.

Because it is offered remotely, several digital technologies were used, enabling rapid information sharing and spaces for interaction, confirming what is exposed in the literature[15]. Even in person, several technological resources can be used in this method to produce videos, present different content, create podcasts, make videos available online, share teaching materials with students, fostering virtual learning environments and synchronous communication[5,10].

Regarding the module content, most participants (88.9%) did not point out negative aspects. Only two participants mentioned the time available to study each content covered. In the flipped classroom model, one of the major challenges mentioned was related to the amount of content required and the number of weekly classes[16].

The strengths mentioned by the students regarding the use of this active methodology were participation, dialogue, respect, and interaction. This occurs since, in this method, besides focusing on the role of the student, there is an exploration (in synchronous moments) of discussion and group work[5]. This exercise of teamwork can favor the multi and interdisciplinary professional practice, so desired by health professionals, especially in the Brazilian Unified Health System (SUS).

One of the most mentioned negative points was the students' difficulty in raising ideas during the discussions promoted in the synchronous meetings. This, without a doubt, is an important challenge faced by the teacher in the use of any active teaching methodology. Whether due to shyness or lack of habit, students need, in their uniqueness, to be welcomed and motivated. Also, this result may demonstrate the pedagogical difficulty of students in using a new teaching-learning method.

In a review article on the advantages and challenges of using flipped classrooms, the main strengths were mentioned: improved student performance, flexible learning, pedagogical contribution, more efficient use of time, positive perceptions of students, and their interaction. As negative points, the pedagogical issues, the perspectives that students and teachers presented, and the technical and technological aspects were pointed out.

However, extra-class activities were perceived as the main pedagogical difficulties[7].

Another point addressed in this study concerned the assessment of student performance by the teacher. Although less discussed than the learning method, assessments need to be seen as a moment that enhances teaching, regulating learning in an integrative way, with spaces for discussions and new discoveries[11]. This evaluation process can create frustrations in students when performed in such a way that students do not feel fully evaluated, but, in this study, all participants were satisfied with how they were evaluated. This result was also confirmed by the similarity of means between the concept attributed by the teachers and the self-concept attributed by the students. The results obtained confirmed previous literature findings[17].

Regarding the number of accesses, the results ensure that all participants had the minimum necessary requisites of internet access to use this method, as the minimum number of accesses ten and five meetings were held. However, reports of access difficulties were cited, and it is important to discuss the lack of access to internet services by Brazilian students since this issue must be considered for the implementation of the Flipped Classroom method. Thus, this pandemic period alerts to the need to create, expand, and consolidate policies aimed at digital inclusion in the school environment[18].

Finally, students were asked to make suggestions about the module. Two students wished that all optional modules of the undergraduate course were carried out with this methodology and that the other teachers used different teaching-learning methods in the remote class period. In courses in the health area, many teachers and managers believe that for changes in the use of pedagogical strategies, there is an imperative need for curriculum modification. However, the teacher can review and transform their way of teaching regarding the course objectives and the skills required for professional training in Speech, Language and Hearing Sciences. For the use of the flipped classroom, for example, there is no need to change the Project or the course curriculum, it can be used without major structural changes[5] and, therefore, be in the current Brazilian educational scenario.

Conclusion

The use of flipped classrooms proved to be an efficient strategy for remote academic activities in Speech, Language and Hearing Sciences due to its easy applicability and its motivational factor regarding such a special moment that the world and, specifically, the educational system have been experiencing as a result of the SARS-CoV-2 pandemic, without the need for changes in the pedagogical design of the courses.

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