

REMOTE TEACHING DURING THE COVID-19 PANDEMIC: CHALLENGES AND POTENTIALITIES OF USING M-LEARNING IN LITERACY CLASSES IN BRAZIL

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ABSTRACT

The research presents the objective of analyzing the challenges and potentialities of teaching with the use of m-learning, in literacy classes during remote teaching caused by the COVID-19 pandemic, based on learning results regarding the appropriation of the writing system alphabetical. In view of the constant social and educational changes caused by the COVID-19 pandemic, in which social isolation became a security measure imposed to reduce the circulation of the virus, they led to the reconfiguration of educational spaces and the adoption of strategies for the continuation of formal education, as an alternative, emergency remote teaching was adopted. Remote teaching has driven changes in education, such as the use of mobile and wireless technologies, cell phones, tablets and notebooks, m-learning, to facilitate the teaching-learning process. A bibliometric review was carried out in order to study and explore the phenomenon with the identification of relevant scientific publications, which were obtained by applying quality and approach evaluation criteria, which showed scientific interest in m-learning and remote teaching. This is a qualitative research on the challenges and potential of using mobile learning with Brazilian children in literacy classes and is configured as an ethnographic case study. The locus of the research were two classes of the 1st year of Elementary School in a public school of the State Department of Education of the Federal District - SEEDF, Brazil, Brasília, Federal District, with a temporal cut of the 1st semester of 2021, having as research subjects 26 children of approximately 6 and 7 years old. The results indicate that despite the challenges faced, the data presented reveal that activities mediated by educational tools such as Google Classroom, Google Meet and the use of student interaction platforms such as the use of digital games and presentation of videos, music and stories interactive activities, among many other factors, demonstrates the potential of m-learning, with the appropriate interventions and pedagogical mediations, however, it is worth noting that access to the online teaching-learning process is still worrying, due to the difficulty of students accessing the internet and the lack of technological devices to monitor the educational proposals, such as computers or smartphones, and the formative weaknesses in relation to the use of TDIC's, therefore, teaching mediated by m-learning, can be considered as a modality of high potential, among other factors, if it is accessible to all.

KEYWORDS

COVID-19 Pandemic, Remote Teaching, M-learning, Literacy

1. INTRODUCTION

The emergence of new technologies redefines communication and interaction environments and, consequently, learning spaces, enabling the (re)creation and development of other teaching and learning modalities and methodologies supported by new technologies in the educational field, such as m-learning or mobile learning, spread worldwide. According to Saikat, et al. (2021), m-learning presents itself as a subdivision of online learning, a type of remote education that takes place in different environments, through the exchange of content mediated by mobile devices, such as cell phones, tablets and notebooks.

Over decades, the discussion about the use of technologies for pedagogical mediation, as well as its limits and potential, has been presented and questioned. With the need for social distancing as a measure to combat the new Corona virus, in a short period of time, the educational field had to be reinvented, institutions

interrupted face-to-face teaching and the use of technologies was quickly incorporated as an alternative for the continuation of activities education.

The pandemic caused by COVID-19, socially, provoked the global challenge of saving lives, human losses are irreparable, educationally, it challenged the (re)invention and (re)signification of educational spaces and teaching approaches used so far. There were countless challenges and limitations emerging from remote teaching, mainly in relation to internet access and the acquisition of mobile technological equipment for the class camp. In Brazil, data from the Internet Management Committee in Brazil (2020), revealed that in 2020, 47 million people did not have access to the internet and according to the UNICEF report on the scenario of school exclusion in Brazil, 3.7 million students enrolled did not have access to school activities and were unable to keep studying and learning at home during remote teaching, this situation of exclusion mainly affected those who already lived in a situation of greater vulnerability, which makes the data even more worrying (UNICEF, 2021).

Silva (2022, p.8) points out that remote teaching was a provisional and emergency alternative for maintaining the teaching-learning process in which classes took place synchronously and asynchronously. Still in this regard, the author points out that “we need to rethink, already in the 'hybrid' form of teaching, [...] alternative ways to realign our organization of pedagogical work”, in addition to the duty to inform the extent to which there was a diversity of scenarios experienced during remote classes in view of the Brazilian regional diversity and the multiple difficulties encountered in monitoring classes.

Amid the educational challenges caused by the COVID-19 pandemic, teachers needed to reinvent their practices. In literacy classes, advancing students in learning the Alphabetic Writing System became even more challenging.

In view of this, the central objective of this research is to analyze the challenges and potentialities of teaching with the use of m-learning, in literacy classes during remote teaching caused by the COVID-19 pandemic.

With this research, it is expected to answer the following question: what were the challenges and potentialities of teaching with the use of m-learning regarding the teaching and learning process of the Alphabetic Writing System?

Therefore, this research is configured as a contribution to the educational field, especially to the area of literacy, as it presents challenges and learning potential with the use of m-learning in literacy classes in Brazil, as an alternative found for the continuity education during the COVID-19 pandemic.

2. RELATED STUDIES

In the last five years, there has been a significant amount of academic work and articles published on the subject of m-learning and remote teaching, in view of the global pandemic scenario.

M-learning refers to a learning style, based on the mobility of contexts, individual, cultural or learning content interactions, mediated by mobile electronic devices such as smartphones, laptops and tablets (Zhonggen & Xiaozhi, 2019.)

Teaching mediated by technologies, resulting from one of the biggest health emergencies, the COVID-19 pandemic, forced teachers to think differently about methodologies and technologies for training and supporting education, these new educational guidelines form a set of radical innovations in terms of form, organization and efficiency (Barletta et al., 2022).

Due to the worldwide closure of schools at all levels of education, the educational system has experienced a shift from face-to-face education to the paradigm of online education, however, the online support offered in response to the global education crisis does not have the characteristics of education online, which is why it was called Emergency Online Education (EOE) in India (Mahanta & Sharma, 2022). In Brazil, in the same sense that it should not be confused with Distance Education (EaD), teaching, due to its emergency nature, was called Emergency Remote Teaching (ERE).

Technologies have changed the way information is accessed and the current educational model. Mobile devices, compatible with the constant and rapid changes in our communication situations, offer quick and easy access to knowledge available online, which encourages reflection on teaching and learning models and the roles played by educators and students, who present an increasingly active profile regarding the educational process. (Criollo et al., 2021). The mobile application facilitates the learning process, but the problems and

difficulties faced by students regarding the lack of access to the internet and mobile devices, challenges and limitations of the modality should be considered (Lima & Isotani, 2021). The low internet connection was a challenge and limitation mainly in emerging countries, where economic conditions for students and teachers may not be favorable (Lima & Isotani, 2021).

The pandemic caused many changes in people's lives, including education, and although these tools were a viable option for continuing classes, a major difficulty encountered by students was access to the internet linked to the quota for accessing materials on the internet, and internet instability to watch videos, participate in games (Lima & Isotani, 2021). There are still several obstacles emerging from the implementation of m-learning, as it is mediated by the use of mobile devices and internet use. Many communities, particularly in rural areas, lack electricity, lack an internet connection, or lack mobile devices capable of supporting mobile learning. Despite the numerous challenges, schools have used mobile learning as an alternative for continuing education during the academic process. (Chibisa & Mutambara, 2022).

In addition to these difficulties, for teachers, another gap found was about the lack of adequate training in the use of technologies and the need to change methodologies that this teaching requires. On the part of educational institutions, there was difficulty in providing adequate technological infrastructure and effective training support for teachers (Barletta et al., 2022).

Access to the online teaching-learning process is still worrying, m-learning can be considered a powerful tool with high potential as a learning modality, if it is accessible to all (Mahanta & Sharma, 2022).

The intensive use of m-learning during this period revealed many enlightening experiences, adding a new perspective for the use of this modality of education, aiming at the present and projecting the future (Saiakat et al., 2021), despite the need to consider the challenges regarding students' lack of access to the internet and mobile devices.

Throughout remote teaching, tools such as Whatsapp, Google Classroom, Zoom, Google Meet were the most common learning strategies during the class period. As online support and instruction tools for students adopted by educational institutions, the most used were videos, audios, Power-Point presentations, text messages, and YouTube video links (Shrutidhara & Chander, 2022). In addition, the combination of more than one of these tools was an alternative found for the widest possible range of students.

The use of these tools was essential to enable communication between teachers and students, so governments and ministries of education need to consider investing in these tools as essential for school success. Google Classroom has good usability and accessibility in addition to the good performance of the tool, it is easy to learn to use.

The correlation between these studies and the present research is identified, since they highlight the challenges and potential of using m-learning in teaching during the COVID-19 pandemic.

3. RESEARCH METHODOLOGY

The objective of this work is to analyze the challenges and potentialities of teaching with the use of m-learning, in literacy classes during remote teaching caused by the COVID-19 pandemic. To achieve this objective, learning outcomes will be observed regarding the appropriation of the alphabetic writing system in literacy classes.

This is a qualitative research on the challenges and potentialities of using mobile learning with Brazilian children in literacy classes, configured as an ethnographic case study.

The ethnographic type case study allows an in-depth study of a given reality, makes it possible to know in depth a particular instance taking into account its context, complexity and own dynamism. It is especially indicated when the focus of the research is a phenomenon that is happening in a real situation and that is contemporary (André, 2005).

For the collection of empirical information, the ethnographic techniques of participant observation were associated, which consists of verifying the largest possible number of situations during the course of the research, to apprehend actions; and document analysis, to contextualize the phenomenon, collecting information from different types of documents (André, 2005). Participant observation of synchronous classes and documental analysis of activities carried out in asynchronous classes were chosen.

The locus of the research was a public school of the State Department of Education of the Federal District - SEEDF, Brazil, Brasília, Federal District. Having as part of the study, the result of learning regarding the

appropriation of the alphabetic writing system in literacy classes. The research was carried out in two classes of the 1st year of Elementary School, with a time frame of the 1st semester of 2021, with 26 children aged approximately 6 and 7 years old as research subjects.

The methodology used to carry out a bibliometric review on the subject was the Theory of the Consolidated Meta Analytical Approach - TEMAC, which allows the integration between the current demands of the literature about scientific works with a view to precision, validity, functionality (Mariano & Rocha, 2017).

As for research preparation, the construction of the research string was carried out, based on words that reflected the theme, involving expressions related to remote teaching during the COVID-19 pandemic, the use of m-learning and the time frame of 5 years, as shown in table 1.

Table 1. Search string

Base de dados	String
SCOPUS	<i>TITLE-ABS-KEY(("m-learning" OR "m learning" OR "mlearning" OR "mobile learning") AND ("covid" OR "covid-19" OR "pandemic")) AND (LIMIT-TO (PUBYEAR,2023) OR LIMIT-TO (PUBYEAR,2022) OR LIMIT-TO (PUBYEAR,2021) OR LIMIT-TO (PUBYEAR,2020) OR LIMIT-TO (PUBYEAR,2019))</i>

Source: authors (2023)

To gather research carried out and related to the topics under discussion in this study, the Scopus database was used, as it is a consolidated and robust base, based on the keywords highlighted in the table above, with the time frame of the last 5 years, from 2019 to 2023. From this query, 314 publications associated with the theme were found, based on a careful analysis considering: number of citations, relevance of the publication to the chosen theme and more recent publications. From the quantitative found, 9 publications were chosen that provide a wide spectrum of information on the subject, including the challenges and potentialities of teaching with the use of m-learning, during remote teaching caused by the COVID-19 pandemic.

The results of this selection, presented in the previous section, allowed the identification of studies that addressed topics similar to the present research, providing scientific evidence and an updated panorama on the application of mobile learning in the teaching-learning process during remote teaching, in addition to providing subsidies for understanding and analyzing the theme in greater depth.

4. REMOTE TEACHING

Despite the challenges and significant educational impacts caused by the COVID-19 pandemic, the biggest pandemic of the 21st century, educational institutions needed to continue to develop ways to (re)invent pedagogical practices to ensure that teaching and learning activities continued despite of the numerous obstacles encountered.

Considering the need for social isolation as a measure to face the global health crisis, the COVID-19 pandemic and the consequent closure of schools, on July 13, 2020, the public education network of the Federal District adopted non-face-to-face teaching alternatives. A little over a year later, on August 5, 2021, based on an escalation scheme, students began to return face-to-face, however, still maintaining hybrid teaching, with face-to-face activities and activities mediated by digital technologies .

For the purpose of checking attendance and learning assessment, the SEEDF adopted as a strategy, for students with internet access, asynchronous activities made available by teachers on the Google Classroom platform and synchronous activities carried out via Google Meet. For students without access to the internet or mobile devices, such as smartphones, tablets and notebooks, printed material was delivered in line with the content available on the platform (DISTRITO FEDERAL, 2020).

According to a UNICEF report (2021) on how municipal education networks in Brazil promoted non-attendance teaching during the year 2020, the most used strategy was the use of printed material (95.3%), followed by Whatsapp (92.9%), recorded video classes (61.3%), online guidelines by apps (54.0%), educational platforms (22.5%), TV classes (4.1%), radio classes (2.6%) and no remote activities were offered (2.4%).

In the classes in which the study was carried out, 77% of the students used the educational platforms provided by SEEDF, Google Classroom and Google Meet or carried out activities through Whatsapp and 23% followed the activities proposed by the printed material strategy.

Teaching mediated by digital technologies, as a result of the COVID-19 pandemic, has highlighted and expanded the inequalities of access to formal education, especially for public school students, exposing the difficulty of accessing the internet and the lack of technological devices for monitoring educational proposals and training weaknesses in relation to the use of TDIC's.

However, this reality also provoked a reflection and redefinition about teaching, providing in the educational field, the appearance of educational tools and methodological innovations, which modified and will modify forever the relationship of the school with the use of mobile electronic learning devices, the m-learning.

4.1 Pedagogical Practices for Carrying out Remote Teaching Using M-learning

The pedagogical activities presented concern, in general, the practice of the two teachers in which the research was carried out, considering that they carried out the planning and execution of activities together, due to the proximity of the students regarding the needs regarding understanding about alphabetic writing. The variations were punctual, however the proposals presented here contemplate the practice of the two teachers.

The alphabetic writing system is a system that represents the sound chains of speech by graphic signs, that is, the representation of speech sounds with the letters of the alphabet. The appropriation of the alphabetic writing system requires the internalization of the rules and conventions of the alphabet, it is necessary to understand the properties of the alphabet as a notational system (Morais, 2012; Soares, 2021).

As highlighted by Soares (2021), the appropriation of this system is a complex process, which requires interaction between cognitive and linguistic processes, in addition to learning carried out systematically and explicitly in the school environment. From the dialogue between development and learning, mediated by someone more experienced, whether a teacher or peers in the social, cultural and school context in which the child's development takes place (Vigotsky, 2007).

Based on strategies that could be attractive, effective and based on digital technologies for students to interact with, such as the use of digital games, YouTube videos and interactive story channels, with a view to advancing students in terms of the alphabetic writing system, pedagogical practices developed with the use of m-learning demanded that the teachers, from the classes in which the research was developed, reinvent their practices from spaces and resources of multimodal communication. Multimodal communication is defined by the different modes that allow for interaction based on semiotic resources in the design of a product (Ribeiro, 2021).

In view of this, the challenge posed to teachers of literacy classes was regarding the realization and effectiveness of this complex process without face-to-face interaction, based on teaching with the use of m-learning.

The specificities experienced by these teachers during remote teaching were complex and challenging, considering that they had to manage multifaceted learning environments with the use of m-learning, with their own technological infrastructure and without having had support regarding training for the use of strategies and methodologies for this teaching.

The use of screens and information and communication technologies influence reading and writing practices and social and communication behaviors (Ribeiro, 2021), mainly due to the COVID-19 pandemic, however, it is worth highlighting, regarding the locus of this research in literacy classes, that the situation of literacy teachers was perhaps one of the most challenging, due to the age of the students (approximately 6 and 7 years old.), which required constant assistance from those responsible for the participation and execution of the proposals and the fact that the students are not literate, which also reduces their autonomy when using commands that require reading and writing.

In addition, the planning of activities should be satisfactory for students who did not have the opportunity to participate in these proposals, but who should also have their rights to the same learning guaranteed.

Bearing in mind that this change in the educational environment requires a change in teaching methodologies, based on learning supported by new technologies, the teachers carried out different educational proposals during classes, which took place synchronously through Google Meet (three times a week). And asynchronously through the Google Classroom platform or via Whatsapp with the posting of a file, in PDF

format, which began with a page organizing the students' weekly routine (with the themes that would be addressed in that period), followed by the weekly activities (organized by day and theme).

Lima and Isotani (2021), regarding the use of Google Classroom, point out that this platform is more effective if combined with other learning platforms such as Google Meet or Whatsapp and that the emerging obstacles of Google Classroom indicate emphasis on teaching methods, which must be adapted to this teaching environment.

The authors' statement reinforces the work that was already being developed by these teachers, who adapted the teaching methodologies to the context of remote teaching, and even combined with the use of Google Classroom, used other learning tools such as Google Meet and Whatsapp as a possibility to increase students' access to education.

About the activities aimed at learning alphabetic writing, in Google Meet, classes were carried out from some supports such as youtube (with the presentation of videos, stories and songs), canva (with the presentation of stories and contents using characteristics of communication digital technology such as the use of interactive images and emojis), Google Jamboard (which the teachers used to make specific explanations about a certain subject, such as getting children to reflect on the graphic similarities of words that share the same sound). In addition, at times the teachers used strategies in which Meet was the means of interaction and communication, for example with the performance of games and virtual dynamics involving, in an interdisciplinary way, the study of alphabetic writing with object hunting at home (from of the initial sounds of the words or some other similarity), presentation of objects that started with the studied letter, production of collective text.

The teachers made use of the available resources and at times tried to adapt practices used in face-to-face teaching, without measuring efforts towards the desired, that the children reached the end of the 1st year, despite the remote teaching, having understood the alphabetic writing system and have arrived at the alphabetical hypothesis of writing (Morais, 2012).

The weekly activities file was sent via Google Classroom, posted on the platform on Mondays and should be returned, with the proposed activities carried out on Fridays. This was a material planned and constructed by the teachers on a weekly basis. Based on the students' advances and difficulties, the teachers planned the proposals for the following week. Furthermore, bearing in mind the specificities of the use of m-learning in literacy classes, the material was proposed considering the digital medium, consisting of hyperlinks that directed the student to videos, stories, educational games, music and pages of curiosities. These weekly activities dialogued with the classes developed on Google Meet.

Students without access to the internet and mobile devices to follow the synchronous and asynchronous proposals, received the material with the same proposals and contents contemplated in the realization in digital media, but with the restructuring of the material contemplating the methodological change that the realization in the paper support requires. The activities were carried out without the help of the teacher, considering that the only form of communication was the digital medium and these students did not have access.

5. DISCUSSIONS

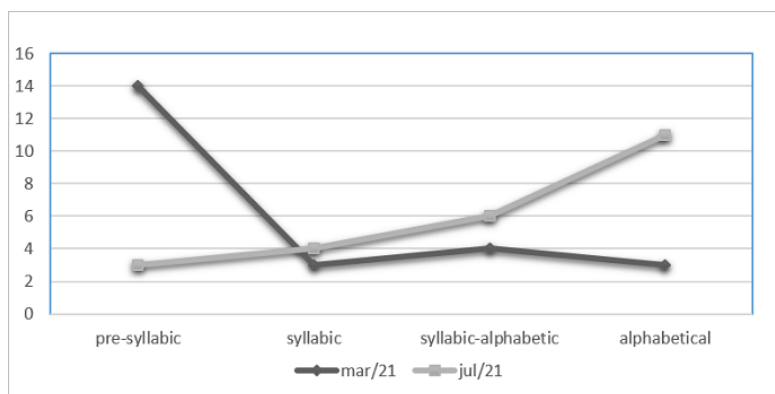
In order to analyze the students' learning results regarding the learning process of the Alphabetic Writing System towards the appropriation of alphabetic writing, we focused our attention on the considerations made about the diagnoses regarding the students' level regarding the comprehension of writing carried out in two moments of the learning path.

The pedagogical practices developed by the teachers with a view to the students' advancement in relation to learning alphabetic writing were based on carrying out an initial diagnostic assessment of the students' level regarding writing comprehension, carried out at the beginning of the semester, based on the psychogenesis of the language writing proposed by Emília Ferreiro and Ana Teberosky (1985).

To carry out the evaluation, the teachers used their own means to contact students and families, via Whatsapp or via Google Meet. Whatsapp presented the feature of being an application already installed on most smartphones and, according to reports from family members, being more practical for users. This strategy was used with students who had mobile devices and internet access, with those who did not have the resources to carry it out, given the need for social distancing, the diagnosis was not carried out in the 1st semester.

Starting from the initial diagnostic evaluation of the students' writing, carried out at the beginning of the 1st semester, the teachers planned their classes and guided their practices. At the end of the semester, after carrying out the educational proposals and with a view to planning the 2nd semester, the teachers carried out a final diagnostic evaluation, through which it was possible to analyze the students' advances in relation to alphabetic writing.

Graph 1 presents data about the progress of students in relation to the writing hypothesis of those who had access to mobile technologies, such as cell phones, tablets and notebooks to enable the teaching-learning process mediated by technology. In the graph, the students' writing hypothesis levels are presented in an increasing way towards alphabetic writing.



Source: authors (2023)

Graph 1. Evolution of writing levels

Students who used printed material did not have access to the internet, so it was impossible to carry out the diagnostic test, but with the hybrid return, in the second half of 2021, it was observed that these students were in a pre-syllabic hypothesis in relation to writing, demonstrating the importance of equal access and permanence in school and the fragility of any educational proposal without proper teacher intervention.

6. CONCLUSION

Remote teaching and the educational conditions imposed by the COVID-19 pandemic, in the reality of public schools in Brazil, highlighted and widened the inequalities of conditions of access and permanence in formal education, especially for those in situations of greater social vulnerability.

As for the results of learning with the use of m-learning in literacy classes, the data presented reveal that students who were able to access and remain in remote teaching, showed significant advances in terms of learning towards alphabetic writing. In this way, activities mediated by educational tools such as Google Classroom, Google Meet and the use of student interaction platforms such as the use of digital games and presentation of videos, music and interactive stories, among many other factors, demonstrate the potential of m-learning, with the necessary interventions and pedagogical mediations.

The students who did not have the opportunity to participate in the remote proposals and had their teaching mediated by printed material, without pedagogical assistance, presented the level of comprehension of writing in the first hypothesis, pre-syllabic, at the end of the semester, making it even more evident. The inequalities caused by the pandemic scenario are evident, especially regarding access to education. Thus, it is worth noting that access to the online teaching-learning process is still a matter of concern, due to the difficulty for students to access the internet and the lack of technological devices to monitor educational proposals, such as computers or smartphones, and the weaknesses training in relation to the use of TDIC's.

Regarding the role of teachers during remote teaching, it is worth highlighting the results achieved regarding the appropriation of the alphabetic writing system, which were only possible due to the interventions and planning of educational proposals carried out by literacy teachers with the use of m-learning, ratifying the essential and irreplaceable character of the work of these professionals, who reinvented their practices and methodologies based on the demands imposed on them by remote teaching, even without the training, technical and financial apparatus of educational institutions.

The data presented reflect a specific reality of the locus of this research, therefore, they cannot be generalized, however, as highlighted in this study and based on the studies related to it, teaching mediated by m-learning can be considered as a modality of high potential, among other factors, if it is accessible to all. In addition, it is necessary for teachers to receive adequate training in the use of educational technologies, which did not happen during remote teaching.

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