"MISSION POSSIBLE": SUPPORTING AN ADOPTION OF A DISTANCE LEARNING MODEL FOR SCHOOLS DURING THE PANDEMIC

Maria Spilker, Antonieta Rocha, Ana Afonso, Lina Morgado, Laboratory of Distance Education and eLearning (LE@D), Open University, Portugal

Abstract

This investigation relates to the professional development of in-service teachers on online teaching in K-12/P-12 schools during the COVID-19 pandemic. The main questions concerned the autonomy and support from/in schools, alternatives found and implemented. A model was developed and applied in different institutions. This article will focus on analysing the results of one Portuguese school.

The study follows a Design-Based-Research methodology. The results revealed teachers have knowledge gaps regarding intermediate/advanced digital skills. Through the training course, teachers' awareness was raised about the distinction between Remote Education and Distance Learning and some skills inherent to online teaching were developed.

Introduction

After the World Health Organization (WHO) declared the COVID-19 circumstance, on March 11th 2020, as a pandemic Portugal tries to slow down the SARS-Cov 2 virus dissemination by decreeing emergency measures and subsequent confinement. These measures include, among others, teleworking and the closure of institutions and organizations, with the main purpose of promoting social distance and avoiding contagion. All the educational institutions, private and public, were included in these measures.

The suspension of face-to-face school activities as a result of the enacted measures and, the need to ensure the continuity of the school year, leads to the Portuguese Government recommendation of implementing Distance Learning solutions for all educational institutions. The lockdown of educational institutions introduced some puzzlement about the concepts in use, specifically, the meaning of distance and its affordances in education. In this sense, though very briefly, it is important to distinguish Distance Learning (DL) from Emergency Remote Teaching (ERT) (Hodges et al., 2020). The DL is characterized by

a physical and temporal distance of the main educational actors, but this distance can be blurred by using the adequate balance between cognitive, social and teaching presence (Garrison & Anderson, 2003). A careful instructional design is key for the success of DL and the role of technology should not be named crucial, neither underestimated. The ERT seeks to provide rapid responses to emergent situations such as the one lived during the pandemic. Conducting a sudden classroom closing off and a forced physical separation between teacher and students, the first impulse was to transpose contents, lecture-based classroom and assessment to the virtual space. The solutions found were based on synchronous sessions (Minghat et al., 2020), still determined by the school hours and, at least, as long as the "normal" classes. The ERT was dictated by curriculum requirements and the intuitive use of web-conferencing as a substitute of the "affordances" (Laurillard, 2002) already existing at the presence teaching environment, rather than scaffolding new paths.

Like other schools worldwide, the Portuguese schools were asked for rapid solutions as an attempt to overcome the suspension of face-to-face teaching, with the enormous need on the part of the schools to self-organize for the benefit of its students (Flores & Gago, 2020). The Portuguese Government defines that teaching must continue at distance, to allow regular contact between students and their teachers and colleagues, and consolidation and development of learning. For this operationalization, the Government suggested that each educational institution should create a Distance-Learning-Plan. This plan should include the constitution of an own support team, if necessary, the taking place of training courses aiming to fill teachers' gaps concerning technological knowledge. Along these lines school support websites was created that provides publications, educational resources, a space for sharing examples of (good) practices, a selection of advisable tools and examples of methodologies to be used. Although these solutions are continuously named as DL, the Portuguese schools offered what Bozkurt and Sharma (2020) call "remote classes".

Aware of the existing inequalities in Portugal, both in terms of the access to own devices and quality broadband, alongside with some digital (il)literacy, the Portuguese government, by March 2020, relaunched and reinforced the maxim of the Program "Portugal INCoDe 2030 National Digital Competencies Initiative" which, on its Axis 2, advocates: (a) Training pre-school, primary and secondary education teachers; (b) Program for training primary and secondary school teachers, with the participation of the Schools Association Training Centres and higher education institutions. Following these measures, the European Digital Transition Action Plan was launched in September 2020, which foresees (a) making individual equipment available for teachers and students; (b) ensuring free mobile connectivity for teachers and students; (c) access to quality digital resources; (d) digital teachers' training plan according to the European Digital Competence

for Educators (European Commission/EACEA/Eurydice, 2019). This idea is supported by the recent analysis of OECD on the potential impact from COVID-19 confinement measures which highlights the unpreparedness of teachers to support digital learning: "ICT skills are particularly important given the radical shift towards online teaching during the COVID-19 lockdown in many OECD countries..." (Schleicher, 2020).

It is the general recognition of the unpreparedness of the majority of teachers (and students), of the most varied teaching cycles, to use and implement DL solutions leading to quality learning, that inspires the training proposal for teachers presented on the following pages. Induced by the lockdown, during the confinement, students realized they had to become more autonomous and teachers assumed new roles in the virtual teaching-learning experience. The changes were not a planned or structured, instead, it was perceived as a difficult experience for both students and teachers.

The pandemic can be perceived as the beginning of change for Portuguese schools. Digital transformation carries new possibilities, more interaction, flexibility and autonomy, the possibility for collaborative learning, developing critical thinking, resilience... This whole situation required, on the part of teachers (and alongside technological literacy) a change in their practice and even teaching culture. In support of this idea, Portuguese teachers reacted proactively to the disruptive context emerging from the COVID-19 pandemic and, recognizing their unpreparedness for the transition from face-to-face classes to the required ERT solutions, creating, for instance, groups for sharing of practices and supporting of each other on teaching in this new context, namely through teachers' associations, as well as scientific community experts in the e-Learning field.

Regarding the cases reported for Europe, we may conclude that the options align with the options also implemented by the Portuguese government. However, cases of countries, such as Finland (Rasmitadila et al., 2020), are reported, where VLEs are already established practice and, therefore, the pressure of an unexpected transition was not felt. On the other hand, in the Portuguese context, Flores and Gago (2020) state that, although there were no mandatory recommendations by the Government, it was important to insure the interaction between students and teachers, to teach online, taking into attention the necessary adjustments in pedagogy and assessment.

Methodology

This investigation emerges from several requests for advice from different non-higher and higher education institutions to face, effectively, the challenge of the emerging situation, namely of the transition from classroom teaching to "real" online teaching. Within this article, we will only focus on analysing the results of a Portuguese school in Lisbon. Based

on a design-based research methodology (DBR) (McKenney & Reeves, 2012), the development of intensive and rapid training, in emergency distance learning modality, was carried out in different stages. In this article, we will present the three first stages, while the last ones, Maturing Intervention and Theoretical Understanding, are still work in progress.

Analysis Stage (DBR)

Literature Review Stage

Initially, the authors made a review on very recent literature concerning the pandemic and its implications at the education system, at an international and national level, alongside with the reports on distance education and remote (emergency) education. This literature review was continuously updated, along with all phases of the research, and the results already presented at the beginning of this article.

Diagnostic Stage – Focus Group

As a first contact moment with the educational institution and to better design a training course to find an answer for the emerging needs, an interview was made to the institutions' stakeholders. The interview was focussed around the following topics: How are teachers coping with the pandemic situation? How are teachers handling the necessity of "teaching from home"? How are teachers getting support, for instance, from the school, colleagues, Ministry of Education? Which are the main barriers (pedagogical and technological) faced by teachers? Overall, how do teachers evaluate the process so far?

To collect information about the pandemic school scenario and gather some (preconceived) ideas, we used a focus groups methodology (Krueger, 2014) with a multidisciplinary group (including school stakeholders, teachers and elearning experts). For instance, the focus group participants stated:

> *"Technology is an obstacle here. I only use it for everyday life and to organize my teaching work." (Teacher #1)*

> *"I believe we need a training on how to adapt these tools to distance learning (...) not on technology. We cannot overload students with zoom lessons." (Teacher #7).*

In summary, the following conclusions and concerns can be pointed out: teachers felt unprepared for online teaching; teachers reflected on their emergency practices and were aware that they were not implementing Distance Education; teachers felt the need for initial training on pedagogical strategies to support DL, as well as the need for adequate

mastery of some teaching support tools; teachers were compiled to relate and communicate differently with the students' families. Furthermore, those involved were motivated and receptive and willing to develop high-quality teaching.

Diagnostic Stage – Survey

Alongside, a survey online was applied to the teachers. The survey comprised multiple-choice questions: 4 to characterize the target audience; 10 to know the level of knowledge about digital tools; and 2 about EaD experience. The questions were arranged based on the literature relevant to the purpose of the research. The survey had 42 respondents. Besides the professional and demographic characteristics, it gathered information about the use of technology in the classroom and the perception of their digital competence.

Participants' characterization

Forty-two teachers answered the questionnaire, of which 78.6% were female and 21.4% male. Ages ranged from 20 to 29 age groups (16.7%) and those over 60 years (4.8%), being in the age group of 30-39 years about 35.7% and 28.3% in the age group 40-49 years. Regarding the levels of education at which the respondents were educators and/or teachers: Kindergarten (3 to 5 years) – 8 educators; 1st cycle (6 to 10 years) – 23 teachers; 2nd cycle (10 to 12 years) – 15 teachers; 3rd cycle (12 to 15 years) – 14 teachers. Likewise, we observed that teachers sometimes assume the teaching of more than one discipline (two to four), resulting from their qualifications and the curricular group(s) to which they belong.

Digital Competence previous to the training

Regarding digital tools, we were interested not only in understanding the level of (non) knowledge but also the level of their (non) use. Thus, it was important to assess the level of digital literacy of this group, as well as their level and intensity (occasional or regular) of the use and applicability of these tools in school context pre-pandemic. Given the diversity of the offer as well as the specific features and applications, we have chosen to separate into different categories: (a) LMS platforms; (b) presentation tools; (c) video editors; (d) image creators and editors; (e) image banks; (f) sources; (g) video excerpts; (h) cloud; (i) online questionnaires and forms and, (j) editing and screen capture.

At the educational level, respondents mostly used email as a communication tool. Regarding the Virtual Learning Platforms themselves the respondents know and use the paid and closed-access educational platform online named *Escola Virtual* and also Google Classroom. Regarding other digital tools, although free and available online, the respondents revealed their lack of knowledge in the context of creating and offering content to their students. The results are quite concerning, as they are not aligned with the European Framework for the Digital Competence of Educators: DigCompEdu (European

Commission/EACEA/Eurydice, 2019). These results were an important starting point, both for the definition of the model and for structuring the training course itself, in which we brought together the offer of digital tools and which provided a starting point and awareness of the OER.

Distance teaching experiences previous to the training

When asked about previous online training courses, 81% of respondents said they had never taken an online training course. Of the remaining 19%, only 4.8% claimed to have had contact with this teaching regime during their formal qualification; 6.8% promoted by guardianship; 6.8% in free training courses. Finally, when asked about tools used in an educational context in approximately one month (between the beginning of confinement and the training course), the respondents stated that they had mainly used Virtual School (18.2%), email (11.4%) and Zoom (14.8%).

These results were also evidence of an option for "traditional", lecture-based teaching, without using new technologies or mobile learning. With institutions having computers, this non-use seems to be a "missed opportunity". As such, and in a lockdown context, this fact led to an increased effort to technologically update and upgrade, but also to an opportunity to meet and adopt new practices, ideally collaboratively, and in communities.

Design Stage

From the collected data emerged the need for designing differentiated scenarios of DL, taking into attention various age ranges and different teaching/learning cycles and adapted to each specific case. This was made through a simplified Analysis, Design, Development, Implementation and Evaluation methodology (Durak & Ataizi, 2016). For the development of content for the intensive training online, the authors used the Rapid eLearning Development methodology: after an analysis of the training need, the objectives were defined; it was paid special attention to the previously gathered characteristics of the target audience; a training plan was designed; content was developed and outlined e-activities, to be performed by the educators and teachers; and, finally, the modality for evaluating trainees and the course itself has been defined.

MIREAD

The MIREAD (*Modelo de Intervenção Rápida em Ensino a Distância* – Rapid Intervention in Distance Learning Model) was developed based on the characteristics of DL, such as described by Anderson and Dron (2011), centred on asynchronous communication and punctual synchronous one. In the following sections, the different MIREAD's aspects are shortly explained. MIREAD was developed based on literature review and the analysis of

information and data gathered and in the experience of the team. From this, 4 guiding vectors for the model were reified.

1. Actors' previous ideas: It is necessary to deconstruct teachers' previously conceived ideas (Moscovici & Doise, 1991) about DL (e.g. Distance Education is synonymous with video conferencing) and, also, to reflect upon the role of communication in online contexts (Quintas-Mendes et al., 2008).

2. Access and familiarity with online technology and culture: It is important to develop digital literacy and soft skills for teaching online, which go beyond the simple mastery of web tools, thus really embracing cyberculture (Santos, 2014).

3. Asynchronous versus synchronous communication: The first impulse of many schools was to use video conferencing systems to replicate the traditional (mostly theoretical) classes. The setback was, like Wiederhold (2020) states, "... people are now beginning to recognize a new phenomenon: tiredness, anxiety, or worry resulting from overusing virtual video conferencing platforms—something researchers and journalists have begun calling 'Zoom fatigue'." Within the framework of MIREAD, we propose the use of synchronous communication, with specific pedagogical goals, in a balanced way, thus maintaining temporal flexibility (Shambaugh, 2016).

4. Moving from a physical to a virtual space: The transition from the face-to-face classroom to online learning requires resources, materials, technology and human resources, as well as a pedagogical design and strategy, and a constant reassessment of the whole process and relationships between the different actors (Pimentel & Gomes, 2019).

MIREAD's main components

In line with the 4 vectors, the two main MIREAD's components are the Weekly Digital Learning Tool (WDLT) and the selected Virtual Learning Environment (VLE).

The WDLT

The WDLT is a planning and communication tool, for teachers and students, which is on the foundations of the pedagogical assumptions of the MIREAD. It provides the students with an overview of the weekly learning tasks to be accomplished, indicating all the tools, resources, schedules and outcomes required. It also must take into account that we are dealing with lower age groups and, therefore, it also plays an important role in helping the caring adult become a mentor of the student in the concretization of the WDLT. It should also not be ignored that the WDLT must take into account particular constraints (Rasmitadila et al., 2020). The WDLT is a structuring component of the MIREAD, as it

operates as a connection element that mediates the pedagogical experience between teachers-students-content and families. It helps the teacher to plan the activities for a class and how to mediate the teaching-learning process. It is the teacher that chooses the resources in line with the activities and their duration (taking into account the workload of each class). It also presents how and when the student is going to be evaluated (for instance through the artefacts uploaded to the VLE) and receives feedback.

The VLE

The second component of MIREAD is the VLE, herein understood as the technological platform that hosts the pedagogical experience. We would like to note that, according to the results of the analysis stage previously conducted, we realized that until the moment of the training implementation, the educational institution was using the email as a communication tool with the students. It was also verified that the teachers had no previous knowledge about VLEs and its use. Taking into account the specific context of the educational institution, it was necessary to find a suitable VLE: rapid implementation; with no additional costs; with a flat learning curve; user-friendly and appropriate children under 12. The VLE should support asynchronous communication, in one place, and integrates a synchronous communication tool, avoiding cyberbullying or zoom-bombing, to make possible all the pedagogical strategies that the teacher wants to apply. It was important to deconstruct the idea that the class should be taken as face-to-face and with the same time slot. During the training, the teachers were sensitized (and felt that themselves) that an online session can be tiring. So the sessions should be delimited in time and with specific aims, also covering social-emotional aspects of the students.

Course Design

In Portuguese schools, the face-to-face classroom essentially prevails. The need to teach online has put many teachers facing enormous challenges. The offer of short-term and intensive training, personalized and to fill gaps, was the solution found to meet the pressing and emerging needs. Thus, MIREAD includes a training course that includes aspects such as DL awareness (main characteristics of DL; Emergency DL model), Online Teaching (Synchronous Communication vs. Asynchronous Communication) and Online Educational Resources and Tools. In this article, we focus only on two aspects that we find to be of greater importance: the Weekly Digital Learning Tool and the VLE selection and use.

Evaluation Stage

Artefacts and study units conceived by the trainees

Based on our observations and feedback given by the trainers to all educators/teachers concerning the implementation of the MIREAD model some results can be presented. The final activity of the training course to be carried out by the trainees consisted of designing and implementing an asynchronous environment for a discipline and outlining a Weekly Digital Learning Tool – WDLT for a specific class. The vast majority performed the activity and in the last training session, some of the final products were presented to the group. Briefly, we observed that the Weekly Digital Learning Tool was decisive short-term planning for the discipline.

Trainees were careful to create interdisciplinary activities, aligning in the timeline the sequence of activities developed in the different units. For example, in the 2nd Cycle of Basic Education, an activity was developed in the Portuguese study unit about a given author, followed by creative work in the Visual and Technological Education unit, as well as a poem in the Musical Education unit. Subjects such as Physical Education, whose teachers initially expressed concern about the operationalization of physical activities at a distance, developed alternatives such as working on theoretical aspects of the subject (e.g. rules of Collective Sports Games), making available videos on collective and individual sports games, and performing physical activities at synchronous weekly meeting times. Foreign Language subjects have chosen to resort to videos on YouTube; to the creation of videos by the teachers themselves, to video recording, via smartphones, by students; focusing on orality training in synchronous sessions.

Trainees' achievements

Overall, the trainees were collaborative, enthusiastic, proactive, open to suggestions and change and, most of all, willing to implement and promote changes (technological and pedagogical) on behalf of students' success. For instance, teachers stated:

> *"The training reassured me because I got an idea of how I can work with my students at a distance without having to resort to a wide range of platforms. Realizing that with only 2 tools (Classroom and Zoom) I will be able to do asynchronous and synchronous work with the students was very reassuring and allowed me to start outlining action plans." (Teacher #1)*

> *"I believe that this training is truly important to overcome all the challenges that lie ahead during the 3rd period in DL and, above all, to bring us closer to our students and to provide them with all the necessary motivation and support." (Teacher #8)*

When looking back at the training conducted, an overview of the trainees' achievements highlights several strengths and weaknesses that may be transversal to teachers from other educational institutions, and that should be taken under consideration in the next iteration of this research.

As for the strengths, we may point out that the trainees showed the capacity to explore and openness for the later adoption of previously unknown digital tools. They were pro-active and searched for solutions through autonomous research. It was rewarding to see real teamwork and a climate of mutual help (especially among colleagues of the same education cycle), sharing practices. The feedback provided by the colleagues and by the training team was always well-received and transposed to (new) practice). The course was perceived as a trigger for teachers to reflect on their classroom practices (physical and virtual) and to strive for better performance by applying the recommendations made throughout the training modules.

As for the weaknesses, we may highlight that there were some operational difficulties associated, namely, with multidisciplinarity in primary school and, more specifically, concerning the design of the unit subject, which encompassed several areas of knowledge (adoption of strategies to avoid the scroll of death). Also, it was not lineal that there is a need to provide detailed guidance to students and to pay special attention to the temporal and/or modular segmentation of activities.

The course was only able to raise awareness on topics related to open educational resources (OER) versus property-based educational resources (such from Virtual School); copyright issues (Creative Commons) and open educational practices (OEP). Furthermore, teachers were generally aware of problems related to issues such as children's data protection. Teachers awarded the training course great importance in that it proved to be a transformative experience of the teaching practices (in an online or face-to-face context) far beyond the objectives initially outlined and specifically associated with distance education.

Further research is being planned, to collect and analyse follow-up information, such as, for instance, how DL was implemented and, effectively, took place, and how the change was evaluated by the stakeholders involved. This will include analysing post-training questionnaire analysis and conducting interviews, to evaluate and improve the model developed, entering a new DBR cycle and aiming for new insights on this field. When professionals "(...) speak about their own crisis of confidence, they tend to focus on the mismatch of traditional patterns of practice and knowledge to features of the practice situation – complexity, uncertainty, instability, uniqueness, and value conflict – of whose

importance they are becoming increasingly aware" (Schön, 2006; p.18). However, after the pandemic challenge, the education professionals "are able to 'practice' their practice" (Schön, 2006; p.60).

Final considerations

The world-scale lockdown imposed by the COVID-19 pandemic had a profound impact in all areas of society and education was not excluded. This emergency situation brought with it a challenge for families, students, teachers and researchers from education-related areas but it's also true "that opening up to uncertainty offers opportunity, diversity and a politics of hope" (Scoones & Stirling, 2020). As Carretero et al. (2021; p.7) in their report highlight "Several lessons for the future can be drawn from schooling practices during the spring 2020 lockdown". Moving from traditional face-to-face educational systems to DL systems is a rather complex process that requires, not only technological infrastructures and human resources, but also the adoption of specific pedagogical principles, features, and practices, supported by scientific research in DL.

Recognizing that occasional ERT solutions, like those generally implemented during the pandemic, require competence and characteristics quite different from those needed at DL, this article focuses on lessons learned from the authors work in responding to training requests from schools during the lockdown scenario. This work led to the development of a Rapid Intervention in Distance Learning Model (MIREAD), mainly based on asynchronous interaction, with some moments of synchronous interaction, to support a community of teachers and schools, in the implementation of an effective and true DL solution. Supported by the assumptions that distance teaching and learning should neither replicate nor simulate face-to-face models; that it should preserve temporal and local flexibility, based on asynchronous communication and that it is based on teacher-student-content interaction, MIREAD was developed as a DL model which encompasses the conceptualization, implementation and monitoring of DL solutions.

MIREAD foresees that the work with the students is based on weekly planned activities proposed by the teacher, with the support of the offered materials (educational resources in digital format). The interaction must be mainly asynchronous with punctual synchronous sessions limited to the essential: one per discipline, per week, lasting 20 to 40 minutes. The importance of the solution proposed in this article lies in the response to pressing problems. Notwithstanding, this solution is also intended to be perceived as a first step towards DL in a broader sense. Distance teaching/learning scenarios have specific characteristics and, request, both from teachers and pupils, singular competence and skills, for instance, concerning the communication online and the workload estimation. This means that, for instance, while designing the WDLT, teachers should be aware of the time

needed by students to conclude a proposed activity. The teacher should also take into consideration that this learning modality requires more autonomy, greater time management skills, and higher levels of motivation from the students and these should be well-supported by a detailed WDLT.

In this context, which might be the teachers' task? After they designed and delivered the WDLT to the students, they have to moderate the different kinds of messages that are posted into the asynchronous environment. The students' messages can include help requests on the content, presentation of the produced artefacts, or social messages. The teacher, online, should pay attention to his workload. It is not expected that the teacher should be 7days/24hours online. On the other hand, the level of students' anxiety tends to grow, so answering relevant questions should be well-timed. In other words, the teachers must be aware and have skills on how to use properly and efficiently the asynchronous communication channels, such as forums, demonstrating how it is expected from the students themselves. The pandemic raised awareness to the urgency of a digital transformation, having implications in the educational area, but also of a cultural transformation, requiring, for instance, open-minded and curious teachers, willing to explore new technologies in the classroom. The next steps of this research aim to assess the teachers' development of competence through rapid and personalised training units and the adequacy of the model to answer the challenges set by the situation of emergency, being sure that it is through education that cultural revolutions take place.

References

Anderson, T., & Dron, J. (2011). Three generations of distance education pedagogy. *The International Review of Research in Open and Distributed Learning, 12*(3), 80. https://doi.org/10.19173/irrodl.v12i3.890

Bozkurt, A., & Sharma, R. (2020). Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. *Asian Journal of Distance Education, 15*(1), 1-6.

Carretero, S., Napierała, J., Bessios, A., Pugacewicz, A., Ranieri, M., Triquet, K., Robledo-bottcher, N., & Montanari, M. (2021). *What did we learn from schooling practices during the COVID-19 lockdown?* Insights from five EU countries. https://doi.org/10.2760/135208

Durak, G., & Ataizi, M. (2016). The ABC's of Online Course Design According to Addie Model. *Universal Journal of Educational Research, 4*(9), 2084-2091. https://doi.org/10.13189/ujer.2016.040920

European Commission/EACEA/Eurydice. (2019). *Digital Education at School in Europe. Eurydice Report.* Publications Office of the European Union. https://doi.org/10.2797/376130

Flores, M. A., & Gago, M. (2020). Teacher education in times of COVID-19 pandemic in Portugal: national, institutional and pedagogical responses. *Journal of Education for Teaching, 46*(4), 507-516. https://doi.org/10.1080/02607476.2020.1799709

Garrison, D. R., & Anderson, T. (2003). *E-Learning in the 21st Century: A Framework for Research and Practice.* RoutledgeFalmer.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The Difference between Emergency Remote Teaching and Online Learning. Educause Review.

Krueger, R. A. (2014). *Focus groups: A practical guide for applied research.* Sage publications.

Laurillard, D. (2002). Rethinking Teaching for the Knowledge Society. *Educause Review, 37*(1), 16-25. https://doi.org/10.1080/0305792022000007463

McKenney, S., & Reeves, T. (2012). *Conducting Educational Design Research.* Routledge.

Minghat, A. D., Ana, A., Purnawarman, P., Saripudin, S., Muktiarni, M., Dwiyanti, V., & Mustakim, S. S. (2020). Students' Perceptions of the Twists and Turns of E-learning in the Midst of the Covid 19 Outbreak. *Revista Romaneasca Pentru Educatie Multidimensionala, 12*(1Sup2), 15-26. https://doi.org/10.18662/rrem/12.1sup2/242

Moscovici, S., & Doise, W. (1991). *Dissensões e Consenso.* Livros Horizonte.

Pimentel, E. P., & Gomes, A. S. (2019). Ambientes Virtuais de Aprendizagem para uma Educação mediada por tecnologias digitais. In E. O. Santos, M. Pimentel, & F. Sampaio (Eds.), *Informática na Educação: autoria, mídia, letramento, inclusão digital.* Sociedade Brasileira de Computação.

Quintas-Mendes, A., Morgado, L., & Amante, L. (2008). Online Communication and E-Learning. In T. T. Kidd & H. Song (Eds.), *Handbook of Research on Instructional Systems and Technology: Vol. II. Information Science Reference.*

Rasmitadila, R., Aliyyah, R. R., Rachmadtullah, R., Samsudin, A., Syaodih, E., Nurtanto, M., & Tambunan, A. R. S. (2020). The Perceptions of Primary School Teachers of Online Learning during the COVID-19 Pandemic Period: A Case Study in Indonesia. *Journal of Ethnic and Cultural Studies, 7*(2), 90. https://doi.org/10.29333/ejecs/388

Santos, E. (2014). *Pesquisa-Formação na Cibercultura* (1st ed.). Whitebooks.

Schleicher, A. (2020). *The impact of covid-19 on education insights from education at a glance.* OECD Publishing.

Schön, D. A. (2006). *The reflective practitioner.* Ashgate Publishing Limited.

Scoones, I., & Stirling, A. (2020). *The politics of uncertainty: Challenges of transformation.* Taylor & Francis.

Shambaugh, N. (2016). Interactivity and Immediacy in Online Academic Programs. In S. D'Agustino (Ed.), *Creating Teacher Immediacy in Online Learning Environments* (pp. 76-90). IGI Global. https://doi.org/10.4018/978-1-4666-9995-3.ch005

Wiederhold, B. K. (2020). Connecting through Technology during the Coronavirus Disease 2019 Pandemic: Avoiding "zoom Fatigue". *Cyberpsychology, Behavior, and Social Networking, 23*(7), 437-438. https://doi.org/10.1089/cyber.2020.29188.bkw