Technological and pedagogical challenges faced by English Language teachers during the COVID-19 pandemic

Desafíos tecnológicos y pedagógicos que enfrentaron los docentes del idioma inglés durante la pandemia por la COVID-19

Juan Manuel López Gómez [a], Julio Cesar Esteves Vargas [b], Juan Luis Escalona Romo [c]

Abstract:

The pandemic caused by SARS CoV 2 has modified the way we learn and teach in the last 18 months. In Mexico, where this study took place, teachers were forced to change their teaching methodology and face to face classes turned into remote teaching. Challenges emerged and some teachers were not prepared to face this new modality. To better understand such challenges this qualitative study reports on the experience of three ELT teachers. Results reveal that these teachers faced challenges in two main aspects of remote teaching: technological and pedagogical.

Keywords:

Technological challenges, pedagogical challenges, pandemic, remote teaching

Resumen:

La pandemia causada por SARS CoV 2 ha modificado la forma en que aprendemos e impartimos clases durante los últimos 18 meses. En México, donde esta investigación tuvo lugar, los docentes fueron forzados a cambiar su metodología de enseñanza y las clases presenciales se convirtieron en clases remotas. Algunos docentes no estaban preparados para enfrentar esta modalidad y se encontraron con varios retos. Para entender mejor dichos retos, este estudio cualitativo reporta la experiencia de tres docentes de inglés. Los resultados demuestran que estos docentes enfrentaron, principalmente, dos tipos de retos durante la enseñanza remota: los tecnológicos y los pedagógicos.

Palabras Clave:

Retos tecnológicos, retos pedagógicos, pandemia, enseñanza remota

Introduction

In January 2020, with the emergency of COVID-19, the World Health Organization (WHO) declared coronavirus as a health emergency of international concern. Some actions to face coronavirus were the closure of schools, cinemas, theaters and other public spaces. In México some strategies such as "Jornada Nacional de Sana Distancia'' (Social Distancing) were implemented. Social Distancing was part of these preventive actions along with the temporary suspension of non-essential activities such as festivals, concerts and so forth. This pandemic has affected different sectors, and education is one of them since the *traditional* face to face way of learning and teaching shifted to remote teaching. As a result, both students and teachers had to adapt and change the way they interact with others.

Because of the pandemic, most schools had to come up with emergency changes and one of them was to set up what many called online classes; however, some authors have argued against this term and suggest that a more *appropriate* term is Emergency Remote Teaching & Learning (i.e., Shisley, 2020; Schuck & Lambert, 2020). This alternative mode of teaching has brought new challenges to both experienced and inexperienced

[a] Autor de Correspondencia, Universidad Autónoma del Estado de Hidalgo, México, ORCID: https://orcid.org/0000-0002-2896-5395

E-mail: lo318322@uaeh.edu.mx

[b] Universidad Autónoma del Estado de Hidalgo, México, ORCID: https://orcid.org/0000-0003-3001-246X E-mail: es391615@uaeh.edu.mx

[c] Universidad Autónoma del Estado de Hidalgo, México, E-mail: es353087@uaeh.edu.mx

teachers due to its hasty preparation and application. Saminathan (2020) mentions that students as well as teachers, moving from conventional classroom and face-to-face teachers' training to computer-based training in a virtual classroom makes the teaching and learning process radically different in many aspects such as self-motivation, and internet issues. Thus, this new mode of teaching posed challenges for teachers.

Having in mind the previously mentioned situation and to provide some insights into this recent topic, the main purpose of this qualitative case study was to identify the challenges that three ELT teachers in a Mexican university have experienced during the pandemic.

Literature review

The pandemic has changed our ways of interacting with others in different scenarios and the classroom is not an exception. In this section we discuss online teaching and emergency remote teaching (ERT), followed by the inclusion of some studies that inform this research.

Online teaching

Online teaching has been a topic of discussion for some years now. It became very popular some decades ago because of the need to give students an alternative to access education. However, it has recently gained more and more popularity among the population. There are different definitions for online teaching. However, we draw on Sadiku, Adebo, and Musa (2018) who state that, "online teaching refers to education that takes place over the internet (...) it is designed to reach and engage the modern learner on a one-to-one basis anywhere, anytime" (p. 73). In other words, online teaching allows students to access education as long as they have an internet connection. However, it is important not to equate online teaching with emergency remote teaching which is a temporary response to the crisis we are going through as discussed below.

Emergency Remote Teaching

Bozkurt and Sharma (2020) argue that the educational system is unprepared and vulnerable to external threats. This seems to be the case due to the pandemic, and to respond to this crisis, emergency remote teaching (ERT) emerged. According to Shisley (2020), ERT is an alternative and unplanned strategy to deliver instructions due to the current crisis which does not allow teachers and students to be in a classroom. Thus, we can argue that Emergency remote teaching can be considered as an online or distance delivery of education which occurs under crisis circumstances (Hodges, Moore, Lockee, Trust & Bond, 2020). Hodges *et al.* (2020) further argue that "it involves the use of fully remote teaching solutions for instruction or education that would otherwise be

delivered face-to-face or as blended or hybrid courses and that will return to that format once the crisis or emergency has abated" (p.10).

Outlining the difference

Online teaching and emergency remote teaching seem to be used interchangeably; however, we need to outline the difference between them. Online teaching is a learning process that provides learners responsibility, and flexibility. It requires careful planning, design, and determined aims and goals to be accomplished which are not bound to be implied in remote teaching (Bozkurt & Sharma, 2020). In contrast, ERT has shown some weaknesses in some areas such as preparation, integration of technology, online pedagogy, course design, faculty support, and teaching training, and so forth (Shisley, 2020). In other words, both modalities are connected provided they are meant to occur in a virtual or online environment. However, online teaching is carefully planned and applied while emergency remote teaching will only be considered as a temporary solution for an immediate crisis with a quick set up and lack of resources (Hodges, Moore, Lockee, Trust & Bond, 2020).

Emergency remote teaching challenges

There are some factors that may limit the success of remote teaching such as inadequate technological equipment, the length of the program, number of students enrolled, and lack of administrative support or technological training. Nevertheless, Toquero (2020) states that these challenges are unavoidable for the educational system and we must aim for a better understanding of these challenges. Therefore, this paper focuses on the challenges faced by teachers while transitioning to ERT.

During this unprecedented period, teachers have dealt with technological issues as well as with new pedagogical challenges and social barriers (Ferri, Grifoni, & Guzzo, 2020). Ferri et al. identified some challenges regarding these three main categories. Technological challenges are mainly related to the unreliability of internet connection and the lack of students' devices. Pedagogical challenges are associated with teachers' and learners' lack of digital skills, the lack of structured content versus the abundance of online resources, learners' lack of interactivity and motivation, and finally teachers' lack of social and cognitive presence. Social issues are mainly related to the lack of physical spaces at home to receive lessons and the lack of support of parents.

Similarly, Yang (2020) signals to some issues dealing with *Online teaching platforms* (technological), *Teacher training* (technological) and *Teachers' willingness to support online learning* (pedagogical) related to two of the categories mentioned before. Moreover, Shisley (2020)

argues that "faculty who teach face-to-face courses typically do not receive training in online teaching pedagogy" (para. 3). In addition, Morce (as cited in Karkar-Esperat, 2018) suggests that "students expected instructors to have the technical proficiency to allow them to focus on working on the course rather than focusing on technical issues" (p. 1725).

In Mexico, studies have shown that teachers at different levels have also faced similar challenges as the ones discussed above. Mendiola et al. (2020) conducted an exploratory study to identify the challenges faced by university teachers at UNAM. A questionnaire that consisted of 18 items, both close-ended and open-ended questions, was administered to 383 teachers. Results revealed four types of challenges; two of them being relevant to this study. Technological challenges "refer to circumstances related to internet access, the availability of computer equipment, knowledge of educational platforms, among others. Pedagogical [challenges] refer to circumstances related to the knowledge of distance education teaching tools, the management of remote groups, the evaluation of students, among others" (p.9).

Flores and Trujillo (2021) also conducted an exploratory study and administered a Google Form to 200 elementary school teachers in a Mexican institution to identify their emotional and professional feelings that originated during the COVID-19 pandemic. Similar to Mendiola et al. (2020), the instrument included both open-ended and closed-ended items. They found that teachers had to use technology and communication tools to design new strategies that complied with distance learning adapting to a new way of working and generating students with digital skills (p.81). Flores and Trujillo also reported that teachers updated their technological skills in order to face the new challenges of distance education, as well as the development of digital skills, transversal skills such as: autonomy, empathy, resilience and socio-emotional skills (p.86).

Finally, Román (2021) conducted a study to identify students, teachers and administrators' feelings, the obstacles, the developed competences and the real challenges that the adjustment from face-to-face to virtual teaching has produced. A questionnaire was administered to 74 students, 33 teachers and 3 administrators. Regarding the obstacles, teachers reported obstacles such as internet connection, students' attitudes, communication, and interaction.

These studies mainly administered questionnaires to show that technological and pedagogical challenges are common challenges faced by teachers. However, to achieve a deeper understanding it is necessary to go past the what and enter into the why the phenomenon develops. To reach that deeper understanding, this study adopts a qualitative approach in order to answer the following research question:

What are ELT teachers´ technological and pedagogical challenges faced during remote teaching over the period of COVID-19?

Methodology

In this study a constructivist worldview was adopted, this worldview is described by Honebein (as cited in Adom, Yeboah & Ankrah, 2016) as an approach which declares that human beings understand and construct their knowledge of the world based on their own experiences. The approach we adopted for this research is qualitative. as it studies the process of interaction between individuals, also paying attention to specific environments in which the participants live and work to get a better understanding of historical and cultural aspects (Creswell, 2014). These interactions with the participants who shared their individual perceptions of a target topic were created during the present research. Moreover, this approach is suitable for this research since we aim at learning about these teachers' perceptions. In this context the information gathered from direct interactions is more relevant for the research.

Case study was used as the research design. Baxter and Jack (2008) defined a qualitative case study as a research method that can use a variety of data sources to explore phenomena in its context. In other words, case study is an in-depth investigation of a person or a group where data is gathered by means of observations or interviews. Nevertheless, due to time limitations we focused only on one unit source. In this context, case study is suitable as we were interested in exploring the phenomena that has been currently occurring and the real-life situations that many ELT teachers have been through during the COVID-19 period.

This research was conducted at a Mexican university in Central Mexico at the Social Science and Humanities institute which offers eleven B.A programs. The B.A in English Language Teaching is one of them, and its main aim is to prepare students to become proficient English educators.

Three participants, one male and two female with an age range from 30 to 50 years, participated in this project. They work as teachers at this BA program. They were selected on the basis that they have been working before and during all this covid-19 pandemic as English teachers. In other words, they have faced this transition from face-to-face classes to emergency remote teaching. A consent form was signed by them to participate and use the information they provided in each interview in this study.

As stated before, the instrument to conduct this research was a qualitative semi-structured interview, which consisted of three parts. The first couple of questions were used to build a rapport with the interviewee. The next

two parts consisted of each type of challenges addressed: Technological and pedagogical. The questions were designed by the researchers with the guidance of a tutor, and the interviews were conducted in English. Approximately, sixteen questions were answered by each subject via *Google Meet.* The interviews lasted about 30 minutes and they were recorded using the same tool.

Based on the nature of qualitative research, we analysed the data by conducting content analysis by the coding process. According to Medelyan (2020), "coding is the process of labeling and organizing your qualitative data to identify different themes and the relationships between them" (para.5). This makes it a powerful tool to identify the relevant pieces of information from the data. Furthermore, it provides the opportunity to categorize the findings into different themes. The coding process was divided into three main steps; we first read all the transcripts. Then, the salient words and phrases were highlighted and labelled assigning them a code. Finally, those codes were compared, and categories emerged.

Results and discussion

Emergency remote teaching has been an alternative to the current health crisis. This modality has posed some challenges for teachers. Regarding the technological challenges, we found that participants emphasize internet connection, equipment problems, and lack of digital literacy and training as the main obstacles they have encountered. As for the pedagogical challenges, we found that teachers must adapt to educational changes by using apps and different platforms, as well as lack of interaction. These findings are discussed below.

Technological Challenges

Technological challenges are mainly related to lack of stable internet connection. Both, Participant 2 and Participant 3, mention that internet connection is one of the main obstacles they have faced during the pandemic.

> We still have this type of issue that has to do with connectivity with this strength of the internet signal audio and video. So yes, I think most of us, both teachers and students have faced this type of problem (Participant 2).
> Well, in general terms, I haven't had a lot of problems with my students. Probably they mainly complain about the internet connection. That is the main complaint, but of course, I have students who I do not believe. They live in rural areas, where there's no good internet connection. So probably like delivering [sic] tasks or assignments was at the beginning a problem for them (Participant 3).

As seen above, this issue reveals the uneven access that people have to the internet regardless of the area where they live in. It is often assumed that the service in the city is more stable than in rural areas as Participant 3 mentions. Living in a remote area or simply having little or no access to internet connection, or not having a reliable

service, may result in delays or connection failures during the lessons and meetings. In this regard, the results show a common issue as the one reported by Ferri, Grifoni, and Guzzo (2020) as they suggest that "one problem observed in all countries (albeit to different extents) was insufficient bandwidth, producing delays or connection failures during lessons and video conferences" (p.7). In other words, even when the social and geographical zones, the teaching lessons and the learning environment were different, the internet connection has primarily been reported as the main concern during this pandemic period. This situation has revealed the digital divide among the population which has affected mainly students who live in rural areas and there is no internet connection, or it is not good enough to attend synchronous sessions. Another issue observed by the teachers was equipment problems since teachers reported having problems with their computer audio or having to start the computers over because they would shut down as stated below,

> I'm starting with my class and then I cannot hear my students and they can only listen to me. And I have to log out then I have to login again. It has bothered me a lot having those issues (Participant 1).
> The computer had shut down. But most of the issues come with, you know, students like, oh, I already refreshed it and I could not access the computer, you know, things like that (Participant 2).

These types of issues reflect the problems teachers have faced. Mendiola *et al.* (2020) report that teachers stress that the access they have is due to out of date, old and damaged equipment, which can make it difficult for teachers to teach their classes making use of the software, tools and platforms that teachers are requested to use. That is why it is a good idea to offer alternatives if this is the case. However, not all institutions have the possibility to lend teachers a computer.

Furthermore, these difficulties may even be worse when teachers do not know how to fix the problems that have to do with microphone and camera issues as Participant 2 mentions below,

> I needed to have my computer taken to the technician because the fact that I was plugging in and plugging out my headphones, broke my computer. I do not remember what the technician said, but I didn't have audio. So, I was able listen to my students but I couldn't use the microphone. That was one of the problems with the camera as well. So, you cannot use the camera (Participant 2).

This extract suggests that teachers may face challenges that they cannot anticipate at all. This type of situation may be more stressful for some teachers because they do not know how to deal with them. These technological challenges are not private of this new modality because these results are similar to the ones reported by Saminathan (2020) who also found that internet issues

are among the salient challenges that instructors face when teaching online. It can be assumed that internet issues are the most common obstacles of this type of teaching because neither teachers nor students can have control over the service they are provided with. So far, we have discussed the technological ones, we now turn to discuss the pedagogical ones.

Pedagogical challenges

Teachers reported that while teaching English in an emergency remote mode, they were forced to adapt their teaching, and while they had already planned for the semester, they were forced to modify not just the methodology but the materials as well, as mentioned by our participants below,

> Yes, it (the pandemic) has modified everything. I used to have material prepared in face-to-face classes and I had to modify it. Now, due to the pandemic I had to study and learn how to use different apps for teaching purposes (Participant 1).

This extract illustrates that teachers were open to changing their teaching methods and they were willing to learn and become familiar with apps that would help them face this new teaching modality. Yang (2020) reports a similar result since most of the teachers were willing to work online as well as investing time in training and overcoming difficulties. Participant 3 also says that:

> There was no choice but we had to modify our ways. Well, I guess the, the pandemic has made us change our teaching ways and discover and learn new things that we were not, at least I was not aware of, and since my academic background didn't actually imply teaching online, I have to do some research and try out different platforms and see what could be suitable for a class. So yes, without a doubt, I have modified my way of teaching (Participant 3).

This extract shows the participants' capacity to react to the current situation and modify their teaching methods as well as the materials they had ready for face-to-face classes. That is, these teachers were prepared for a different type of interaction and had to adapt their teaching. Nevertheless, with this situation, teachers had to use additional resources which they were not familiar with. This situation, however, helped them to increase their technological skills because as they mentioned, they were forced to train themselves and look for alternatives to react to these new demands. Moreover, Shisley (2020) suggests that many teachers have proposed and applied creative, quick and innovative solutions to deliver class in the online course.

Due to the current phenomena, and as a result of social distancing, our participants suggests that lack of face-to-face interaction among teachers and students is another challenge encountered by them as shown in the extracts below:

> I think it's easier to identify that you guys are not getting it but here online, you know, everybody just wants to leave, and everyone is like yeah yes, I understand this move on. So yes. I think that's the challenge and I do not feel confident in terms of you guys having or getting the knowledge that you're supposed to (Participant 3).

> It's totally different, rather than Face to Face classes. I mean, you can talk with your students a lot, they respond in the same way so we can have conversations but whenever it comes to online classes, it's different (Participant 1).

In the planning of online learning, it is necessary to model not only the content, but also the different interactions that occur in this process. In fact, Bernard (as cited in Ferri, Grifoni, & Guzzo, 2020) have found that "interactions increase learning outcomes" (p.4). However, this interaction is now mediated by a computer screen or any other digital device which does not help to create a nice environment. This situation can also affect students' willingness and motivation to participate in class since many students do not turn on their cameras as suggested by one of our participants below,

> The students do not feel like participating because they don't want to turn on their cameras, so they prefer not to say anything, and they do not respond. Sometimes, not always, but many, many times in your session. There are those students who do not want to interact and of course, the ones who are going to be affected are the learners because they know that they have to participate. I cannot force them (Participant 2).

Interaction among teachers and students is affected. Students do not like to participate because they do not like turning their cameras on or because the internet is so bad that it does not support this facility. As Toquero (2020) discusses in his study, one of the greatest challenges in his study was to create connections and achieve productive learning environments with the students. Despite these challenges faced by our participants they agree that they were able to find solutions to them, and we now turn to discuss them below.

Overcoming challenges

There were some similarities between some of the open challenges found in this research with other projects (i.e., Yang, 2020; Ferri, Grifoni, & Guzzo, 2020). Nevertheless, we came across a few strategies which teachers have used to overcome some of the challenges they mentioned. Regarding technological challenges, they highlight their willingness to learn how to use and implement new technologies on their own. This can be considered as part of teachers' autonomy. It is well known that students are more involved in the use of cutting-edge technologies, different from teachers which have shown less capability to operate with platforms and devices along

with the lack of formal training as shown in the extracts below,

> We did not have formal training. But I mean, I've been taking some courses, well online courses so I had an idea of how I can do somethings, but for months of training I don´t (Participant 1).

> So, I needed to train myself. I was looking for tutorials, I was talking to some other colleagues and yeah, mainly on my own like looking for what could be the best tool for me to use with my students for my classes so, so far, the only training I got was from the University but not as completely. And for this type of remote teaching (Participant 2).

> As I mentioned before, I think most of the teachers have looked for different things to see what is best for us, what works, and everything. So, yes, we have had some training although I think it's very limited, but we also have, you know, done our own research in terms of discovering new things (Participant 3).

Two of the participants (P2 and P3) agree that even though they received some training, it was limited, so they had to train themselves or look for other options to cope with the situation. These options have to do with the use of different platforms and sources to teach their classes. Thus, the participants agreed on taking up new sources to teach.

In terms of pedagogical challenges, teachers focused on solving the lack of interaction with their students. Looking for ways to raise their students' motivation as stated below,

> But I want to improve my classes with my students, and I think they're helping me. So, they are like teachers…we can use this app teacher, we can do this. So, with the help of them, I think we're doing a good job (Participant 1).

> I moved some activities to Nearpod in which I do not only require, you know, the participation in an oral Forum, but I can also make you write in a post-It and have it up. So, I have tried to find ways for you to participate and to interact, but it is difficult (Participant 3).

These statements show a similar belief in terms of how these teachers try to solve the lack of interaction while delivering a topic with students. Walder, McGorry and Widener (2012) found that educators who can master the combination of technology (Online learning techniques) content and pedagogy would have more effective expertise in promoting engagement among students. What is more, students participated to improve their interaction with their teachers as Participant 1 mentioned. In other words, it can be interpreted as the student's willingness and motivation to be in touch with their teacher.

These findings showed that the main challenges faced by teachers were internet connections and equipment issues -related to technological areas-, and the adaptation of their teaching methods and the lack of interaction with their students -related to pedagogical challenges-.

Furthermore, we have revealed that even when remote teaching was unknown for the participants, their willingness to overcome prompted their autonomy to learn new alternatives of sources and apps to carry out their classes.

Conclusions

This study has revealed that these English teachers have faced some challenges such as unstable connectivity, lack of interaction and communication. This report also shows that teachers have been willing to overcome such difficulties during this emergency remote teaching, and most of them have implemented self-learning strategies by taking courses about the use of different apps and resources to incorporate in their classes.

Teachers also reported interaction is a big challenge they have faced during remote teaching because the rapport that is created in face-to-face classes is not the same through a computer screen. Students do not feel confident to participate during the synchronous sessions, and many of them do not turn their cameras on. Thus, teachers have to find ways to promote interaction among their students to make them feel engaged and part of the teaching environment, regardless of the teaching delivery means.

We expect this research to be helpful for future generations and teachers who can encounter similar difficulties in their careers. We hope that future researchers can conduct similar studies to identify a new teaching method that responds to similar emergency situations.

References

Adom, D., Yeboah, A. & Ankrah, A. (2016). Constructivism philosophical paradigm: Implication for research, teaching and learning. *Global Journal of Arts and Social Sciences.* 4(10), pp. 1-9. Retrieved from: https://www.eajournals.org/wp-content/uploads/Constructivism-Philosophical-Paradigm-Implication-for-Research-Teaching-and-Learning.pdf

Baxter, P. & Jack, S. (2008). Qualitative case study methodology: study design and implementation for novice researchers. *The qualitative report*, *13*(4), pp. 544-559. Retrieved from http://www.nova.edu/ssss/QR/QR31-4/baxter.pdf

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), i–vi. https://doi.org/10.5281/zenodo.3778083

Creswell, J. (2014). *Research design: qualitative, quantitative, and mixed methods approaches* (4th ed.). Sage.

Duncan, H. & Young, S. (2009). Online pedagogy and practice: Challenges and strategies. *The Researcher*, 22(1), 17-32, pp.18-23. Retrieved from: https://www.researchgate.net/publication/282662578

Ferri, F.; Grifoni, P. & Guzzo, T. (2020). Online Learning and Emergency Remote Teaching: Opportunities and Challenges in Emergency Situations. *Journal Societies, 1*0(4), pp.1-18; Retrieved from https://doi.org/10.3390/soc10040086

Flores, B. & Trujillo, J. (2021). Los retos de la educación a distancia en las prácticas educativas durante la pandemia de COVID-19. *Revista RedCA,* 4(10), pp. 73-88; Retrieved from https://doi.org/10.36677/redca.v4i10.16558

Hodges, C., Moore, S., Lockee, B., Trust, T. & Bond, A. (2020). The difference between emergency remote teaching and online learning. EDUCAUSE review. Retrieved from: https://er.educause.edu/articles/2020/3/the-difference-between-emergency-remote-teaching-and-online-learning

Karkar-Esperat, Tala. (2018). International graduate students' challenges and learning experiences in online classes. *Journal of international students*, *8*(4), pp. 1722-1735. Retrieved from https://doi.org/10.5281/zenodo.1468076

Medelyan, A. (2020). *Coding Qualitative Data: How to Code Qualitative Research (Updated 2020).* Insights: Thematic. Retrieved from https://getthematic.com/insights/coding-qualitative-data/

Roman, J. (2020). La educación superior en tiempos de pandemia: una visión desde dentro del proceso formativo. *Revista Latinoamericana de Estudios Educativos RLEE*, 50(especial), pp. 13-40. https://doi.org/10.48102/rlee.2020.50.ESPECIAL.95

Sadiku, Matthew, Adebo, Phillip, & Musa, Sarhan (2018). Online Teaching and Learning. International Journal of Advanced Research in Computer Science and Software Engineering, 8(2), pp. 73–75. https://doi.org/10.23956/ijarcsse.v8i2

Saminathan, V. (2020). *Problems of Online Classes*. International Journal of Academic Research Reflector.9 (6), pp.1-3. Retrieved from: https://www.researchgate.net/publication/348447927

Sánchez Mendiola, M., Martínez Hernández, A.M.P., Torres Carrasco, R., de Agüero Servín, M., Hernández Romo, A.K., Benavides Lara, M.A.,

Jaimes Vergara, C.A., & Rendón Cazales, V.J. (2020). Retos educativos durante la pandemia de COVID-19: una encuesta a profesores de la UNAM. Revista Digital Universitaria, 1-23.

Schunk, Rachel. & Lambert, Rachel. (2020). Am I doing enough? Special educators' experiences with Emergency Remote Teaching. *Education sciences,* 10(11), pp. 1-15. Retrieved from https://www.mdpi.com/2227-7102/10/11/320

Shisley, S. (2020, May 20). Emergency Remote Learning Compared to Online Learning. *Learning Solutions.* Retrieved from https://learningsolutionsmag.com/articles/emergency-remote-learning-compared-to-online-learning

Toquero, Cathy. (2020). Emergency remote education experiment amid COVID-19 pandemic in learning institutions in the Philippines. International Journal of Educational Research and Innovation, 15, pp.162-176. https://doi.org/10.46661/ijeri.5113

Waldner, Leora., McGorry, Sue., & Windener, Murray. (2012). E-Services-Learning: The Evolution of Service-Learning to Engage a Growing Online Student Population. *Education Outreach and Engagement*, 16 (2). Available at: http://files.eric.ed.gov/fulltext/EJ975813.pdf

World Health Organization. (2020). IHR Emergency Committee on Novel Coronavirus (2019-nCoV). Retrieved from: https://www.who.int/director-general/speeches/detail/who-director-general-s-statement-on-ihr-emergency-committee-on-novel-coronavirus-(2019-ncov)

Yang, X. (2020). Teachers' perceptions of large-scale online teaching as an epidemic prevention and control strategy in China. *SAGE*, 1-6. https://doi:10.1177/2096531120922244

NOTAS