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Education in Emergency: Lessons Learned About School Management Practices and Digital Technologies

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Abstract

In a period strongly marked by constraints and abrupt societal changes, school leaders had to manage the pandemic crisis, guide changes, and find new solutions to respond to the demands of increasingly digitalised schools. In this context, a study was carried out to identify the main challenges faced by school leaders in Portugal and how digital technologies (DTs) were used by school leaders to address those challenges. From the methodological point of view, a questionnaire with closed and open questions on DTs during the COVID-19 pandemic was submitted to Portuguese school leaders between November 2020 and March 2021. Based on a descriptive statistical analysis of the closed questions and the content analysis of the open answers of 145 school leaders, the results point to aspects related to lack of training, lack of resources, widening inequalities and communication issues. The DTs are the same as used before. However, these technologies were used more frequently. These findings imply the need to invest in continuous training for school leaders in managing crises, how to optimise the use of DT in schools; and to capitalise on internal and external partnerships in collaborative efforts and to network to overcome the lack of resources, social needs, and inequalities. The lessons learned during the process of finding and evaluating solutions can contribute to improving school management processes in crises, in a post-pandemic future.

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Introduction

The pandemic caused by COVID-19 imposed on school leaders the task of taking decisions and organising measures to provide immediate responses to the new and incoming contingencies (Hargreaves & Fullan, 2020; McLeod & Dulsky, 2021). In this situation, most schools developed a process denominated "Education in Emergency" (Pokhrel & Chhetri, 2021). This process, which school leaders were obliged to undergo, implied the change from traditional face-to-face learning to distance education through various digital technologies (DT).

According to the DIGICOMP 2.2, the European digital competence framework, the term digital technology "comprises any product that can be used to create, view, distribute, modify, store, retrieve, transmit and receive information electronically in a digital form" (Vuorikari et al., 2022, p. 64). It includes hardware, software, digital resources, and platforms. UNESCO (2022, p.27) states that digital platforms "allow users to disseminate content to the wider public. Such platforms include social media networks, search engines, app stores, and content-sharing platforms".

While acknowledging the existence of schools around the world that were already developing learning through the combination of face-to-face and distance learning environments (Eurydice, 2019), the UNESCO report (2020) refers to schools that had to adopt this regime abruptly due to social isolation and school closures during the pandemic. According to this document, the distance education strategy of these schools during the pandemic crises comprised three phases: phase 1 – rapid response; phase 2 – the daily routine of distance learning practices; phase 3 - the new normal of school education after

the crisis. Since the data collection was concluded at the beginning of 2021, the information presented in this article is related to phase 1 and phase 2.

Emergency remote education (ERE) occurred mainly in phase 1, representing the temporary shift of instructional delivery mode to fully remote teaching solutions for education during the crisis (Hulges et al., 2020), differing from distance education.

The main difference between ERE and distance education is that ERE is characterised by the use of videoconference tools for synchronous online classes (e.g. Colibri Zoom, Google Meet) and by the exchange of resources by e-mail or cloud. Distance education encompasses the different forms of communication involving remote learning (e.g. e-learning, b-learning, m-learning) and demands a careful plan, a pedagogical model and teacher training (Monteiro, Mouraz & Dotta, 2021).

After some months of confinement, some schools began to adopt more consistent distance learning practices (phase 2) through the generalised adoption of digital platforms such as learning management systems (e.g., Moodle, Blackboard, Canva), other workspaces for online collaboration and communication (e.g., Teams, Classroom) or other digital technologies to promote interaction and share contents (e.g. online noticeboards such as Padlet or Jamboard).

The development of structured action plans, the mass promotion of teacher training courses, and some rules for online and distance education, including evaluation processes, were also used. The schools that already had those distance learning practices settled also had to develop a strategic plan due to the need to generalise this means of content delivery and pedagogical interaction.

Although the pandemic has not been overcome, the lessons learned during the process of finding and evaluating solutions can contribute to improving school management processes in phase 3, where the development of an online education ecosystem is expected (European Commission, 2020). Online education goes beyond distance learning, encompassing learning mediated by digital technologies, despite the distance or the time synchronicity (Singh and Thurman, 2019).

Taking this idea into account, the aim of the study developed was to take stock of the challenges encountered by school leaders in managing the use of DTs during the pandemic due to COVID-19 and answer the following questions: What were the main challenges for schools and school leaders during the pandemic crisis in Portugal? How were digital technologies used by school leaders to address those challenges, and for what purpose?

School management practices and digital technologies during the pandemic crisis

The unprecedented context gave rise to studies focused on the mediation of technologies and the effects on teaching-learning processes. Oliveira et al. (2021) developed an exploratory study on the emergency remote education experience of higher education students and teachers from Portugal and Brazil during the COVID-19 pandemic. The study's main findings suggest that the ERE can be characterised by the educational process, information and communications technology (ICT) usage, and personal adaptation. The results evidenced increased teacher-student interaction and content development, difficulties in the online evaluation process for achieving the expected outcomes, a lack of training and struggle in adopting technologies, and negative personal experiences, including workload and mental health.

Similar results were presented by Khan (2021) in a literature review focused on learning, teaching, and assessment approaches adopted by higher education institutions since the COVID-19 outbreak. That study identified the following main themes: digital learning, E-learning challenges, the digital transition to emergency virtual assessment, the psychological impact of COVID-19, and creating collaborative cultures. The findings highlighted the importance of "training in digital literacy, the use of online flipped classrooms, encouraging students to use peer-to-peer learning, and the building of community collaborations" (p. 10). It also mentioned that there must be more studies about the "role of leadership in handling the transformative change, leading in crisis, and structuring effective communication" (p. 11), which aligns with the study presented in this article.

In the same line of reasoning, Parpala & Niinistö-Sivuranta (2022) affirmed that articles about school leadership processes and experiences were less represented. They conclude that leaders need more training and support to face crises collaboratively and informally. Other aspects involving leadership experiences and changes in practices caused by COVID-19 in primary school leaders are presented by Howard & Dhillon (2021). The same authors indicated that leadership has been in a state of turbulence rather than crisis because leaders had to respond to a backdrop of constantly changing government guidance and organisational demands as a result of the ebb and flow of the pandemic. Based on a previous study about outstanding leadership characteristics in primary Education (Dhillon, Howard & Holt, 2020), the study aimed to examine the impact that the changes caused by COVID-19 had on the leadership of serving head teachers. The main findings point to a shift in the importance attributed by the leaders to "high expectations of all

members of staff and pupils" (p. 34) (considered the most important characteristic relating to outstanding leadership in the first study) to the acknowledgment of the importance of the relationship with stakeholders (considered the most important characteristic relating to outstanding leadership in the second study).

Regarding digital technologies during this period, the focus and main results of studies were related to the *impact of digital leadership among school principals* (AlAjmi, 2022): principals' digital leadership positively influences technology use in schools and also influences teacher engagement.

According to Rincones, Peña, & Canaba (2021), Torrato, Aguja, & Prudente (2021), Wilson et al. (2021) and Yildiz, Kilic, & Acar (2022), school leaders also have an important role and must be prepared to take decisions regarding the delivery of educational content by utilising technology.

Another finding is associated with *education equity* (Cordeiro et al., 2021): the responses to COVID-19 From non-state school leaders in Latin America, sub-Saharan Africa, and India point to the support provided during school closures (35% of the participants indicated that they offered some support through technology and 53% through paper methods). Technologies utilised included messaging apps, video or audio conferencing, and/or LMS.

One study also pointed to the *leadership behaviours that influence educational technology adoption and implementation in higher Education* (Lalani, Crawford, & Butler-Henderson, 2021): the study emphasised the importance of empowerment, involvement, and collaboration; academic leaders with emotional intelligence and emotional stability; the necessity of distributing leadership responsibilities to a network of

teams and the quality of communication to all stakeholders through a variety of communication channels. These ideas align with the study of Price & Mansfield (2021), which considers the importance of community stakeholders as school educational leaders' advisors.

Another aspect regarding the use of digital technologies during the pandemic crisis was related to the *resilience in learning environments* (Raghunathan, Darshan Singh, & Sharma, 2022): the results highlighted the importance of strong leadership that provides "trust of teachers, increased self-motivation, enhance communication with stakeholders and emphasise systems that enhance student-teacher communication" (p. 1).

From a broader temporal perspective, there have been several studies related to the issue of the role of school leadership in promoting the integration of digital technologies into the school environment and practice (Piedade & Dorotea, 2021; Piedade & Pedro, 2014), both at the curricular and pedagogical levels and related to management and institutional communication (Piedade & Pedro, 2014). Piedade and Dorotea (2021), in conducting a literature review focused on this topic, found that the research results highlight the decisive role of school leadership in integrating digital technologies in the school context. However, many of the studies analysed indicate the need to develop programmes to increase skills in technologies and innovation directed at school leaders and to encourage policies for the use of technologies. Regarding the use of digital technologies in school management and administration practices, the studies analysed by Piedade and Dorotea (2021) indicate that despite positive beliefs and attitudes towards technologies, the school leaders' practices and decisions on the purchase of school licenses are usually limited to Office applications, as word processing and desktop publishing and presentation software,

internet tools and other platforms provided by the Minister of Education. The use of other specific tools for management tends not to be reported.

In turn, research reveals the scarcity of studies conducted in Portugal involving digital technologies by school leaders in their daily activities (Piedade & Dorotea, 2021; Piedade & Pedro, 2014). According to Piedade and Pedro (2014), "this absence of studies in a national context may be justified by the scarcity of training initiatives in the area of digital technologies targeting school directors" (p. 4). Piedade and Dorotea (2021) corroborate this idea, claiming that this absence of studies with school leaders at the national level "may, in part, be justified by the scarcity of initiatives and training programmes in the area of digital technologies aimed specifically at school directors" (p. 759), since, in recent years, most of these initiatives and programmes have been aimed at primary and secondary school teachers (Piedade & Dorotea, 2021; Piedade & Pedro, 2014). There is a lack of research on this issue and the relevance of the role of school leadership in integrating and using technologies and modernizing practices in the school context.

The Role of Leadership in the Integration of Digital Technologies in School Education in Portugal

Regarding the integration of digital technologies in Portugal, the first National Program was the project "MINERVA" (1985-1994) (Portugal, 1985), which had the objective of introducing ICT in primary and secondary schools. After MINERVA, many other programmes and initiatives were developed with more specific focuses (e.g., Programme Nonio-Século XXI, 1996-2002; uArte – Internet at schools, 1997-2002; Initiative Schools, Teachers and Portable Devices, 2006-2007), however, the next big national programme, which generated

several initiatives, was the Technological Plan in Education (TPE) (Ministério da Educação, 2009).

The organic and operational model for the implementation of DT in the services of the Ministry of Education was amended by Order No. 143/2008 of 3 January (Ministério da Educação, 2008), published in the Official Gazette (Diário da República). The following year, 2009, through Dispatch no. 700/2009, of 9 January (Ministério da Educação, 2009), TPE teams were created as well as structures for the coordination and monitoring of the implementation and development of TPE projects at the level of educational establishments. Within the teams, the coordinator function is inherently held by the school leader, who is also responsible for the designation of the other members of the TPE team.

There was a regulation gap between 2010 and 2021 regarding ICT in Education in Portugal. During this period, policies regarding the use of ICT in schools were guided by general European guidelines (e.g., Digital Agenda for Europe 2010-2020, European Commission, 2010) through national directives (e.g. Digital Portugal Agenda, Portugal, 2012).

Technology in education started to gain more visibility in 2020 when all Portuguese schools were closed. From one day to the next, given the impossibility of face-to-face teaching, classes had to be mediated by television broadcasting and digital platforms, such as Moodle, Teams, or Classroom. This situation continued until the end of the year, the first return to a face-to-face regime. During this period, school leaders were faced with the need to reorient strategies and reinvent solutions capable of solving problems, even if in part, posed by the pandemic and health issues (McLeod & Dulsky, 2021). One highlighted need was the importance of creating conditions for all

students to access online classes, seeking to reduce pre-existing situations of inequality that were intensified in this pandemic period (Bonal & González, 2020; Muchacho, Vilhena, & Valadas, 2021).

In the same year (2020), following what was established in the Action Plan for Digital Education 2021–2027 (European Commission, 2020), in Portugal, the Digitalisation Programme for Schools was implemented, under the Action Plan for Digital Transition (Presidência do Conselho de Ministros, 2020), which foresees the development of a programme for the digital transformation of schools.

This programme also includes a digital teacher education plan based on the European Digital Competence Framework for Educators (DIGICOMPEDU) (Punie & Redecker, 2017), as explained before. In the same framework, each school was asked to develop a school digital development action plan (SDDP) focusing on the domains of school organisation referred to in DIGCOMPEDU: professional involvement, teaching and learning, assessment, continuous professional development, and leadership. Once again, leaders were called on to find solutions for digital education involving the entire educational community in school decisions. Their in-depth knowledge of the realities of each context was considered essential to ensure inclusive and democratic education and contribute to achieving social justice (Leite & Sampaio, 2020; Sampaio & Leite, 2018, 2021; Bolívar, 2012).

Among the competencies assigned to the school leader is also responsible for all procedures involving the definition of strategies, intervention plans, and educational integration of digital technologies in the school context (Piedade & Pedro, 2014). Thus, the responsibility of school leaders is clear in implementing processes of incorporation and insertion of digital technologies into the daily activities of the

various actors who make up the school framework. Therefore, the study presented below is relevant.

Method

A questionnaire was used for data collection between November 2020 and March 2021. The questionnaire consists of 11 items in Portuguese, including open-response and closed-response items – a multiple-choice, five-point Likert-type scale (from 1 = strongly disagree to 5 = strongly agree) and dichotomous scale (yes and no) – organised into three groups of questions: 1) sociodemographic data, allowing a profile of the respondents; 2) DT used, addressing the DT most used during management tasks and about the specificities of the pandemic period; and 3) effects of the use of DT, specifically alluding to the advantages or contributions and the problems and difficulties in their use, including an open question about the difficulties faced due to the pandemic.

The questionnaire was validated by panels of school leaders, mainly about the wording of the items in the closed-response questions. This procedure was intended to exhaust the most significant number of existing possibilities for each question, ensuring the appropriateness of these questions which, being closed-ended, facilitate data processing in extension. After this validation process, the questionnaire was submitted to a pre-test and applied to a sample selected "by convenience" (Ghiglione & Matalon, 1992; Hill & Hill, 2005). This application was performed online on the Google Forms platform during June and July 2020. After this pre-test phase, some adjustments were made to the terminology used, some questions were eliminated, and others were added that allowed collection of data on the pandemic situation that was being experienced in schools. The final

version of the questionnaire was developed on the LimeSurvey platform and its application took place between November 2020 and March 2021, authorised by the Ministry of Education. An e-mail with the link to the questionnaire was sent to all Portuguese school leaders from the 732 Portuguese public school clusters. The researchers ensured that the participants understood what was involved in the study, how that information would be used and how and to whom it could be reported. Participants were ensured and informed of the right to free and voluntary participation, without financial compensation, as well as the right to withdraw from the research at any time. The confidential and anonymous treatment of participants' data was also guaranteed (BERA, 2018).

This was a descriptive study, with descriptive statistics. The intentional sample was composed by 145 school leaders responded, of whom 62% (N = 90) are female and the remaining 38% male. The average age is 53 years old (SD = 6.24), with an average professional experience of 29 years (SD = 7), belonging to public schools from different regions of mainland Portugal (North 33%, Centre 14.6%, Lisbon 3.9%, Alentejo 14.6%, Algarve 3.9%).

Data obtained through the responses to closed-ended questions were subjected to statistical analysis using the SPSS v.28 software package, which included frequency analysis performed to identify the frequencies of DT use by leaders, and the purposes and frequency of DT used during the pandemic period.

The open-ended responses were content analysed (Bardin, 1977) using the NVivo 1.6.1 software package. The analyses followed these steps: pre-analysis (fluent reading); exploration of the material (coding and categorisation) taking excerpts of the discourse with relevant meaning for the respective category as the unit of analysis – the categories

emerged from the answers given by the school leaders; and then treatment, inference and interpretation of results in the light of the study objectives. The quantification of the frequency of the responses in each category was supported by the NVivo software.

Results

Challenges for School Leaders during the Pandemic Crisis

The results about the challenges faced during pandemic were obtained via content analysis of the open questions. When asked about the main challenges faced, most leaders referred to issues related to the lack of resources/equipment and lack of internet access for teachers and students; the increase in inequalities, namely because some students did not have computers or had difficulty accessing the internet; the lack of training and communication difficulties. Figure 1 systematises the content analysis categories and the absolute number of references to each challenge made by the school leaders.

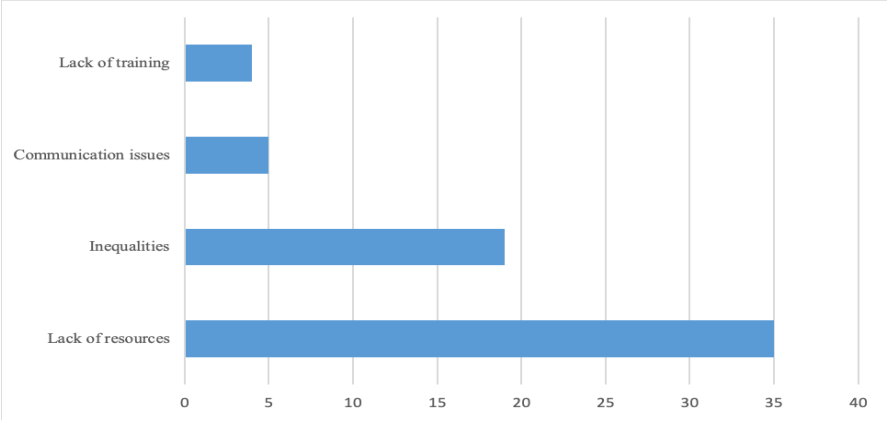

Figure 1.

Main challenges due to COVID that emerged from the leaders' responses (absolute number of references obtained in the content analysis)

Regarding the digital resources, the lack of equipment or the fact that it is obsolete or of poor quality as well as difficulties with internet access, were the aspects most referred to, as evidenced in the following statements:

> Evidence of: the mismatch between the existing equipment and the requirements of the most up-to-date software (…) and the scarcity of digital resources in households (L3).
>
> Pupils are in areas with no mobile network (L35)
>
> Evidence of conflict in the timing of using equipment in each household (L3).

As can be understood from the answers, in 2021, many families were still without equipment or an internet connection. In Portugal, the lack of efficient computers and the weakness of the Internet network affected more than 75% of students belonging to all regions during the initial period of the pandemic (CNE, 2021). These elements also revealed and accentuated pre-existing student inequalities, which are also visible in the following perceptions:

> Access to digital platforms and technologies is not universal ... and even generates more and bigger inequalities among students, which had a negative impact on learning and consolidation of knowledge (L17).
>
> Increasing inequalities in access to the teaching and learning process (L61).

The intention to leave no one behind, expressed by official Portuguese documents (Presidência do Conselho de Ministros, 2020), is jeopardised by the growing conditions of social inequality in Portuguese schools. School leaders' statements referred to exacerbated

social inequalities (mentioned by almost 50% of the leaders). It can be identified that despite the efforts to combat or minimise the barriers of access for students belonging to less favoured groups, the period of the pandemic showed that many students and families did not have the necessary conditions, in terms of equipment and/or digital literacy, to meet the new demands caused by social confinement.

The respondents mentioned the lack of training in terms of computer expertise and knowledge about the distance learning modality:

> The age of the vast majority of teachers with whom I work and the need for greater awareness of the use of digital platforms and technologies, even though a brilliant job has been done, from one moment to the next, without specific training, for teachers to have to move to distance learning (L43).

> The deficient level of computer knowledge (technical and basic functioning – working with Word, Excel, educational platforms) of most of our students, and the lack of resources/internet in most Portuguese families (L48).

Even though there is no direct relationship in the literature between teachers' age group and the use of digital technologies (Monteiro, Mouraz & Dotta, 2021), many leaders mentioned that teachers' advanced age might be a factor in their lack of digital skills. Respondents noted the need for training in the areas of technology concerning students, families, teachers, and the leaders themselves.

Communication difficulties expressed concerns include too many contacts to manage, a lack of face-to-face interactions (L43); personal and individualised connection, and isolation of students, teachers, and non-teaching staff (L119). Some of these concerns can be found in the following statement:

> Students who, due to image rights, do not turn on cameras or microphones and it is not possible to know if someone is on the other side or if the equipment is just on. Parents were intervening in the middle of a synchronous class (L62).

The problems presented, from the management of communication processes to the issue of the personal data protection regime, show that, although digital platforms may help in the internal and external communication processes of schools, the pandemic period highlighted some aspects to be improved. These include the effectiveness of communication, optimisation and standardisation of means, and clarity in communication processes between leaders, teachers, staff, family, and the wider community.

Digital Technologies Used in the Pandemic Period

The results about the DT used in the pandemic and the effects of the period of use were obtained from the answer to the closed questions in the questionnaire. Figure 2 shows the most commonly used DT mentioned by the respondents. The graphic represents the means of the Likert scale (1-5).

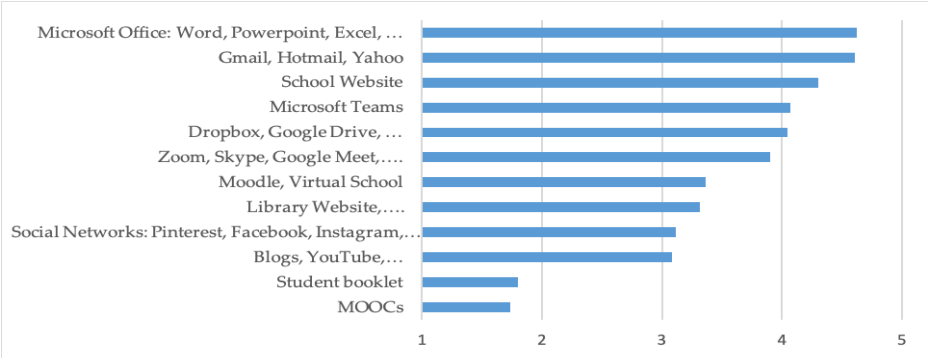

Figure 2.

Digital technologies used by school leaders (means from 1-5 Likert scale

As can be seen, the DT most used was the Microsoft Office applications ($\bar{x}$ = 4.62; SD = 0.61), followed by e-mail ($\bar{x}$ = 4.61; SD = 0.80), the school's web page ($\bar{x}$ = 4.3; SD = 0.88), Microsoft Teams ($\bar{x}$ = 4.7; SD = 1.15), and the cloud ($\bar{x}$= 4.04; SD = 0.98). Videoconference platforms ($\bar{x}$ = 3.9; SD = 0.88) were also widely used. On the other hand, the DT least used were MOOCs ($\bar{x}$ = 1.74; SD = 1.11) and the student's digital booklet ($\bar{x}$ = 1.80; SD = 1.26), respectively.

When asked about the frequency and use of DT during the pandemic, the vast majority of leaders (95.2% of respondents; N = 138) responded that they started using them more frequently, although, according to many leaders, for the same purposes as before (69%; N = 100). This result may be associated with the fact that school leaders already used online media and strategies for sharing and completing tasks before the pandemic. The 31% of school leaders who indicated they used DT for other purposes referred: "carry out administrative tasks remotely", "online meetings"; "teacher and staff training", "follow-up and monitoring of covid-19 in the school setting".

As demonstrated by the study presented in this article, most school leaders admitted not using DT to perform tasks they did not previously perform, except for bureaucratic tasks entailed by the health situation, including the need to prepare teachers and staff for the new professional demands.

Figure 3 shows the effects of using DT selected by the school leaders in the questionnaire. The graphic represents the means of the Likert scale (1-5).

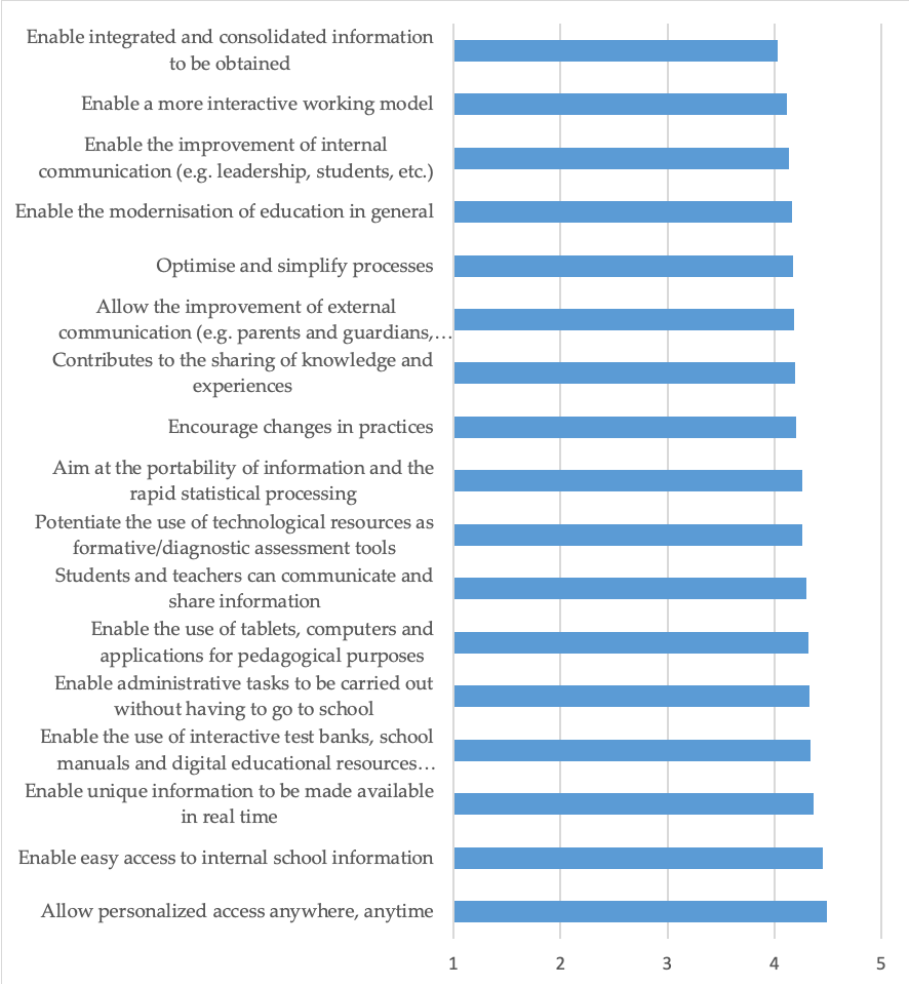

Figure 3.

Effects of using digital technologies, in the framework of the quarantine situation, due to COVID-19 (means from 1-5 Likert scale)

Concerning the effects of using DT in school, all the items had an average rating above 4. Of these, the aspects with the higher score were: increased access to personalised information at any time and place ($\bar{x}$ = 4.49; SD = 0.65); enabled easy access to internal school information ($\bar{x}$ = 4.45; SD = 0.62); increased availability of data in real-time ($\bar{x}$ = 4.37; SD = 0.60); broader access to didactic and curricular materials ($\bar{x}$ = 4.34; SD = 0.54); made it possible to carry out tasks remotely ($\bar{x}$ = 4.33; SD = 0.73); increased the access to equipment for teaching purposes ($\bar{x}$ = 4.32; SD = 0.73); and improved the diversification of the means of communication and sharing of information between teachers and students ($\bar{x}$ = 4.30; SD = 0.60).

Conclusions

Given the emergency education caused by the pandemic, school leaders had to innovate their management practices, evidencing their ability to quickly redefine strategies, networking, and distribution of responsibilities (Harris & Jones, 2020; McLeod & Dulsky, 2021; Giordano, 2021). The schools were closed during the pandemic, which required leaders to find solutions to keep classes running and intervene in unexpected problems and challenges.

Regarding the first research question of the study presented, the most referred challenges were the lack of resources, increased inequalities, the lack of training, and communication issues. The same reasoning is stated by Alajmi (2022) when he identified the main factors that prevented teachers and school leaders from integrating technology into Kuwaiti schools. In his opinion, there are problems related to the lack of information and communications technology (ICT) preparation, teacher competence, and inadequate technology

resources. These challenges aren't entirely new since previous studies have reported this situation (Afshar et al., 2010; Cakir, 2012).

Concerning the second research question, the school leaders used DTs more frequently for communication, administrative tasks, teacher and staff training, and learning mediation, unexpectedly changing the school routine. This finding is in line with the Page and Paiva (2021) study. However, the increased intensity of the use of DTs did not mean increased diversity of functionalities for most school leaders, except when using platforms to manage health issues during the pandemic period. This circumstance may indicate the need for investment in the professional development of school leaders, as some of them recognised it.

The lessons learned during the pandemic crisis have leadership implications. One of the implications is related to the importance of an intervention that guarantees access and conditions for all students to use and participate in digital environments (CNE, 2021; Cordeiro et al., 2021; King & Logan, 2022). Even though the European governments have developed programmes to reinforce students' digital equipment and teacher training (European Commission, 2020), the pandemic showed inequalities. This situation is in line with the Commission Internationale sur Les futures de l'éducation (2020) conclusions.

Another lesson learned showed the importance of investing in leaders' professional development regarding managing uncertain situations (Alajmi, 2022; Parpala & Niinistö-Sivuranta, 2022). According to Rincones, Peña, and Canaba (2021), this training investment would help to create opportunities to explore emotional aspects of leadership.

The findings reported in this article also corroborate Pokhrel and Chhetri (2021) and Price and Mansfield (2021) when they point out the

importance of establishing partnerships and networking to foster knowledge sharing and conditions to develop new solutions to common problems. The COVID-19 pandemic can be considered an opportunity to make open technologies and networks available to teachers and students. Contrary to this more optimistic view, Mohamed et al. (2022) drew attention to the importance of the sustainability of digital transformation supported by an "innovative architectural design" (p.2), which remains an underdeveloped area.

In sum, besides the lessons learned, the study revealed the importance of considering the schools' socioeconomic characteristics in future studies (Harris et al., 2020; Patrick & Newsome, 2020).

References

Abreu, A., Afonso, A. P., Rocha, A., & Cota, M. P. (2016). Electronic booklet: Vision of teachers and guardians of basic school students of Galicia. In *11th Iberian Conference on Information Systems and Technologies (CISTI)*, pp. 1–6. doi:10.1109/CISTI.2016.7521513

Afshari, M., Bakar, K. A., Luan, W. S., Afshari, M., Fooi, F. S., & Samah, B. A. (2010). Computer use by secondary school principals. *TOJET: The Turkish Online Journal of Educational Technology*, *9*(3), 8–25.

Bardin, L. (1977). *Análise de conteúdo* [Content analysis]. Lisbon: Edições 70.

AlAjmi, M. K. (2022). The impact of digital leadership on teachers' technology integration during the COVID-19 pandemic in Kuwait. *International Journal of Educational Research*, *112*, Article 101928. doi:10.1016/j.ijer.2022.101928

Bolívar, A. (2012). Justicia social y equidad escolar: Una revisión actual. *Revista Internacional de Educación para la Justicia Social*, *1*(1), 9–45.

Bonal, X., & González, S. (2020). The impact of lockdown on the learning gap: Family and school divisions in times of crisis. *International Review of Education*, *66*(4), 635–655. doi:10.1007/s11159-020-09860-z

British Educational Research Association [BERA]. (2018). Ethical guidelines for educational research, fourth edition, London. Retrieved from https://www.bera.ac.uk/publication/ethical-guidelines-for-educational-research-2018-online

Cakir, R. (2012). Technology integration and technology leadership in schools as learning organizations. *TOJET: The Turkish Online Journal of Educational Technology*, *11*(4), 273–282.

Commission Internationale sur Les futurs de l'éducation. (2020). *L'éducation dans un monde post-Covid: Neuf idées pour l'action publique* [Education in a post-Covid world: Nine ideas for public action]. Paris: UNESCO. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000373717_fre

Conselho Nacional de Educação [CNE]. (2021). *Educação em tempo de pandemia: Problemas, respostas e desafios das escolas* [Education in a time of pandemic: Problems, responses and challenges for schools]. Lisbon: Conselho Nacional de Educação. Retrieved from https://www.cnedu.pt/pt/noticias/cne/1673-educacao-em-tempo-de-pandemia-problemas-respostas-e-desafios-das-escolas

Cordeiro, P. A., Gluckman, M., & Johnson, A. (2021). Responses to COVID-19 from non-state school leaders in Latin America, Sub-Saharan Africa and India: A call for educational equity. *Frontiers in Education*, *6*, Article 618323. doi:10.3389/feduc.2021.618323

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crises. *Journal of Educational Technology*, *49*(1), 5–22. doi:10.1177/0047239520934018

Dhillon, J. K., Howard, C., & Holt, J. (2020). Outstanding leadership in primary Education: Perceptions of school leaders in English primary schools. *Management in Education*, *34*(2), 61–68. doi:10.1177/0892020619885942

European Commission. (2010). A digital Agenda for Europe. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52010DC0245&from=en

European Commission. (2020). *Digital education action plan 2021-2027: Resetting Education and training for the digital age*. EUR-Lex. Retrieved from https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0624

European Union (2018). DigicompEdu. Retrieved from https://area.dge.mec.pt/download/DigCompEdu_2018.pdf

Eurydice (2019). *Digital Education at school in Europe, Publications Office*. Retrieved from https://data.europa.eu/doi/10.2797/763

Ghiglione, R., & Matalon, B. (1992). *O inquérito: Teoria e prática* [The survey: Theory and practice]. Lisbon: Celta.

Giordano, D. F. (2021). Um olhar sobre o trabalho dos gestores escolares no contexto da pandemia [A look at the work of school managers in the context of the pandemic]. *Educação Básica Online*, *1*(1), 125–133. doi:10.24115/s2675-949720211119, pp.125–133

Hargreaves, A., & Fullan, M. (2020). Professional capital after the pandemic: Revisiting and revising classic understandings of teachers' work. *Journal of Professional Capital and Community*, *5*(3/4), 327–336. doi:10.1108/JPCC-06-2020-0039

Harris, A., & Jones, M. (2020). COVID-19: School leadership in disruptive times. *School Leadership & Management*, *40*(4), 243–247. doi:10.1080/13632434.2020.1811479

Harris, D.N., Liu, L., Oliver, D., Balfe, C., & Slaughter, S. (2020). How America's Schools Responded to the COVID Crisis. Retrieved from https://educationresearchalliancenola.org/files/publications/20200713-Harris-et-al-How-Americas-Schools-Responded-to-the-COVID-Crisis.pdf

Hill, M. M., & Hill, A. (2005). *Investigação por questionário* [Research by questionnaire]. Lisbon: Sílabo.

Howard, C., & Dhillon, J. K. (2021). Outstanding primary leadership in times of turbulence. *Education Sciences*, *11*(11), Article 714. doi:10.3390/educsci11110714

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

Khan, M. A. (2021). COVID-19's impact on higher Education: A rapid review of early reactive literature. *Education Sciences, 11*(8), 421. doi:10.3390/educsci11080421

King, F., & Logan, A. (2022). Leadership for inclusion and special Education: Novice teachers walking the walk. *Research in Educational Administration and Leadership*, *7*(1), 132–160. doi:10.30828/real.967318

Lalani, K., Crawford, J., & Butler-Henderson, K. (2021). Academic leadership during COVID-19 in higher Education: Technology adoption and adaptation for online learning during a pandemic. *International Journal of Leadership in Education*. doi:10.1080/13603124.2021.1988716

Leite, C., & Sampaio, M. (2020). Self-evaluation and social justice on Portugal's school's evaluation. *Cadernos de Pesquisa***,** 50(177). doi:10.1590/198053146835

McLeod, S., & Dulsky, S. (2021). Resilience, reorientation, and reinvention: School leadership during the early months of the COVID-19 pandemic. *Frontiers in education*, *6*. doi:10.3389/feduc.2021.637075

Ministério da Educação. (2008). Despacho n.º 143/2008, de 3 de janeiro [Order No. 143/2008, of 3 January]. Diário da República, 2.ª série, n.º 2, pp. 151–153.

Ministério da Educação. (2009). Despacho n.º 700/2009, de 9 de janeiro [Order No. 700/2009, of 9 January]. Diário da República, 2.ª série, n.º 6, pp. 873–878.

Mohamed Hashim, M. A., Tlemsani, I., & Duncan Matthews, R. (2022). A sustainable university: Digital transformation and beyond. *Education and Information Technologies*. doi:10.1007/s10639-022-10968-y

Monteiro, A., Mouraz, A., & Dotta, L. (2021). Veteran teachers and digital technologies: Myths, beliefs and professional development. *Teachers and Teaching*, *26*(7-8), 577-587. doi:10.1080/13540602.2021.1900809

Muchacho, L., Vilhena, C., & Valadas, S. (2021). COVID-19 e desigualdades escolares [COVID-19 and school inequalities]. *Educação, Sociedade & Culturas*, *59*, 183–202. doi:10.24840/esc.vi59.342

Oliveira, G., Teixeira, J., Torres, A., & Morais, C. (2021). An exploratory study on the emergency remote education experience of higher education students and teachers during the COVID-19 pandemic. *British Journal of Educational Technology*, *52*(4), 1357–1376. doi:10.1111/bjet.13112

Page, J. S., & Paiva, D. C. (2021). Estudo de caso com gestores escolares: Os desafios da comunicação em grupo por meio de plataformas digitais [Case study with school managers: The challenges of group communication through digital platforms]. *Revista Educação Pública*, *21*(26). Retrieved from

https://educacaopublica.cecierj.edu.br/artigos/21/26/estudo-de-caso-com-gestores-escolares-os-desafios-da-comunicacao-em-grupo-por-meio-de-plataformas-digitais

Parpala, A., & Niinistö-Sivuranta, S. (2022). Leading teaching during a pandemic in higher Education: A case study in a Finnish university. *Education Sciences*, *12*(3), Article 147. doi:10.3390/educsci12030147

Patrick, J. (2022). Student leadership and student government. *Research in Educational Administration and Leadership*, *7*(1), 1–37. doi:10.30828/real.951165

Patrick, S.K. & Newsome, U. (2020). Teaching Through a Global Pandemic. COVID-19 Insights from the Tennessee Educator Survey. TN Education Research Alliance. Retrieved from: https://peabody.vanderbilt.edu/TERA/files/TES2020_COVID_Brief_FINAL.pdf

Piedade, J., & Dorotea, N. (2021). Validação da escala de utilização das tecnologias digitais na gestão escolar. *ETD - Educação Temática Digital*, *23*(3), 757–775. doi:10.20396/etd.v23i3.8657850

Piedade, J., & Pedro, N. (2014). Tecnologias digitais na gestão escolar: práticas, proficiência e necessidades de formação dos diretores escolares em Portugal. *Revista Portuguesa de Educação*, *27*(2), 109–133. doi:10.21814/rpe.6254

Pokhrel, S., & Chhetri, R. (2021). A literature review on impact of COVID-19 pandemic on teaching and learning. *Higher Education for the Future, 8*(1) 133–141. doi:10.1177/2347631120983481

Portugal (2012). Resolution of the Council of Ministers no. 112/2012. Retrieved from https://portugal2020.pt/legislacao_e_normas/resolucao-do-conselho-de-ministros-no-112-2012/

Portugal. (1985). Ministerial Order 206/ME/85 of 31 October. Retrieved from https://dre.tretas.org/dre/9620/despacho-26-85-de-28-de-dezembro

Presidência do Conselho de Ministros. (2007). Resolução do Conselho de Ministros n.º 137/2007, de 18 de setembro. Diário da República n.º 180/2007, Série I de 2007-09-18, pp. 6563–6577. Retrieved from https://dre.pt/application/conteudo/642198

Presidência do Conselho de Ministros. (2020). Resolução do Conselho de Ministros n.º 30/2020, de 21 de abril. Diário da República n.º 78/2020, Série I de 2020-04-21. Retrieved from https://dre.pt/dre/analise-juridica/resolucao-conselho-ministros/30-2020-132133788

Price, D. C., & Mansfield, K. C. (2021). Leadership in the time of COVID: Connecting community resources to meet the needs of North Carolina students. *Frontiers in Education*, *5*, Article 615101. doi:10.3389/feduc.2020.615101

Punie, Y. (Ed.), & Redecker, C. (2017). *European framework for the digital competence of educators: DigCompEdu*. Luxembourg: Publications Office of the European Union. doi:10.2760/159770

Raghunathan, S., Darshan Singh, A., & Sharma, B. (2022). Study of resilience in learning environments during the Covid-19 pandemic. *Frontiers in Education*, *6*, Article 677625. doi:10.3389/feduc.2021.677625

Rincones, R., Peña, I., & Canaba, K. C. (2021). A call for rethinking schooling and leadership in the time of COVID-19. *Frontiers in Education*, *5*, Article 618075. doi:10.3389/feduc.2020.618075

Sampaio, M., & Leite, C. (2018). Mapping social justice perspectives and their relationship with curricular and schools' evaluation practices: Looking at scientific publications. *Education as Change*, *22*(1), 1-21. doi:10.25159/1947-9417/2146

Sampaio, M., & Leite, C. (2021). Relationships between the assessment of school quality and social justice. *Educational Research*, *63*(1), 133-146. doi:10.1080/00131881.2020.1857654

Singh, V., & Thurman, A. (2019). How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018). *American Journal of Distance Education, 33*(4), 289–306. doi:10.1080/08923647.2019.1663082

Torrato, J. B., Aguja, S. E., & Prudente, M. S. (2021). Using web video conferencing to conduct a program as a proposed model toward teacher leadership and academic vitality in the Philippines. *Education Sciences*, *11*(11), Article 658. doi:10.3390/educsci11110658

UNESCO. (2020). Ensuring effective distance learning during COVID-19 disruption: Guidance for teachers. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000375116?posInSet=1&queryId=N-fa0d1b85-35c1-47bd-b6cb-5bf336a60464

UNESCO. (2022). Guidelines for regulating digital platforms: a multistakeholder approach to safeguarding freedom of expression and access to information. Retrieved from https://unesdoc.unesco.org/ark:/48223/pf0000384031.locale=en

Vuorikari, R., Kluzer, S. and Punie, Y., (2022). DigComp 2.2: The Digital Competence Framework for Citizens - With new examples of knowledge, skills and attitudes, EUR 31006 EN, Publications Office of the European Union, Luxembourg. ISBN 978-92-76-48882-8. doi:10.2760/115376.

Wilson, J. C., Kandege, P., Edjoukou, A. J., & Teklu, M. T. (2021). Unpacking smart education's soft smartness variables: Leadership and human resources capacities as key participatory actors. *Education and Information Technologies*, *26*(5), 6267–6298. doi:10.1007/s10639-021-10599-9

Yildiz, S., Kilic, G. N., & Acar, I. H. (2022). Early childhood education during the COVID-19 outbreak: The perceived changing roles

of preschool administrators, teachers, and parents. *Early Childhood Education Journal*. doi:10.1007/s10643-022-01339-w

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