Conference Research Paper

DOI: https://doi.org/10.18357/otessac.2023.3.1.163
https://otessa.org/
#OTESSA

Emergency Remote Teaching and Digital Technology Usage in K-12 Teacher Practice

Amber Hartwell
Okanagan School of Education
University of British Columbia - Okanagan

Correspondence: Amber Hartwell
Okanagan School of Education, University of British Columbia - Okanagan Email: amber.hartwell [at] ubc.ca

Abstract

Digital technologies are being used more in K-12 classrooms than prior to the COVID-19 pandemic. In efforts to slow virus spread, many government authorities worldwide forced schools to close in March 2020. In response, many school jurisdictions transitioned to emergency remote teaching (ERT). As schools re-opened, confirmed virus cases required government-mandated isolation periods, and schools pivoted classes to ERT. Commonly, ERT requires the use of video conferencing software, learner management systems, and cloud-based tools. Not all teachers and students were familiar with these but used them out of necessity. This case study research explored the impact of ERT occurring between March 2020 and September 2022 on digital technology usage in current K-12 teacher practice. Data were collected from K-12 teachers through an online questionnaire, semi-structured interviews, a document review, and analytic memos. Analysis and interpretation of findings were organized by using Cultural Historical Activity Theory (CHAT). Research revealed most technology added for ERT remained, with some becoming common in teacher practice, suggesting that teachers' digital technology ability and skill strengthened. Teachers also perceived growth in student communication and collaboration skills. Additionally, findings indicated digital access barriers experienced by teachers, students, and families have begun to influence teacher decision-making processes.

Keywords: emergency remote teaching, ERT, COVID-19, pandemic, pandemic pedagogy, teaching methods, educational technology, technology and change, K-12

Introduction

COVID-19 impacted 1.6 billion learners in over 190 countries and resulted in the largest disruption of education in modern history (United Nations, 2020). Education across all levels and countries either immediately halted or transitioned to a distance learning model in Spring 2020 (B.C. Ministry of Education, 2020a; 2020b; Hinshaw, 2020). School sites were deemed unsafe until additional medical knowledge of virus transmission was obtained. Emergency remote teaching (ERT) became an immediate solution, with numerous school jurisdictions introducing e-learning within weeks of the pandemic beginning (B.C. Ministry of Education, 2020a; 2020b). Over the 2020–2021 school year, a large population experienced reoccurrences of ERT. As K-12 schools transitioned back to in-person learning, many staff, students, and families experienced two-week exposure isolation periods when students came in close contact with confirmed COVID-19 cases. In these scenarios, attempts were made to continue instruction through ERT while students were at home. Fall 2021 brought changes once again in Canada as variants of COVID-19 showed transmission in children and vaccines became available to people over the age of five. School closures and student isolation were still employed when outbreaks were declared. ERT remained as the approach during these instances.

ERT was a sudden and unfamiliar shift from pre-pandemic education structures, changing teacher practice (Black et al., 2021). While teachers continued with whole class instruction, project work, quizzes, discussion, and teacher demonstrations, these were delivered through distance synchronous, asynchronous, and blended hybrid ERT formats (Shamir-Inbal & Blau, 2021; Yao et al., 2020). Commonly, this required the use of digital technology, such as video conferencing software, learning management systems, and cloud-based technologies. Research on perceptions of ERT in K-12 education is abundant, and largely critical (Ewing & Cooper, 2021; Jimoyiannis et al., 2021; Noor et al., 2020; Shamir-Inbal & Blau, 2021; Trust & Whalen, 2020; 2021). However, research is limited on the long-term impact of ERT during COVID-19 on K-12 teacher practice. Using Cultural Historical Activity Theory, (CHAT; Figure 1), this study specifically explored the impact of ERT on use of digital technologies in K-12 teacher practice. Rooted upon Vygotsky's (1986) contribution of mediation, Engeström (1987, 2014) introduced the notion of an activity system, viewing human learning as built on historical experiences, social context, and constant interaction with the environment and others (see also Koszalka & Wu, 2004). Specific to this inquiry, abrupt transitions from in-person to ERT disrupted existing teacher activity systems.

Methodology

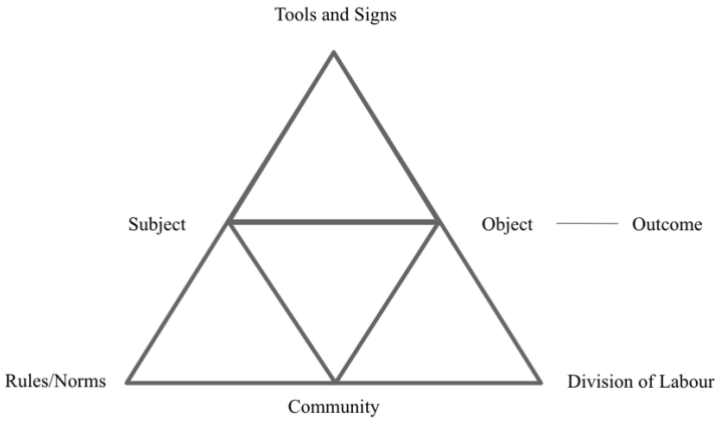
This case study research was guided by one primary research question: *how has ERT during COVID-19 impacted the use of digital technologies in K-12 teacher current practice?* Bounded by time and location, participants were K-12 teachers enrolled in a graduate program at one university during the Fall 2022 semester. The unit of analysis was K-12 teachers who experienced ERT at least once between March 2020 and September 2022.

Data collection consisted of the use of an online survey, semi-structured interviews, a document review, and analytic memos. Thirty-six prospective participants started completing the survey. Screening questions to ensure eligibility resulted in 24 participants. The final question asked participants to identify if they were willing to volunteer for a 60-minute semi structured interview, reflecting on their ERT teaching experiences. Nine participants volunteered for an interview, which were audio recorded using Zoom closed captioning. Six interview participants shared

documents with the researcher. One analytic memo was completed after ten survey responses had been collected to check for emerging themes and points to consider for further clarification in interviews. Memo notes were taken during the interview to record hunches, interpretations, and speculations during the interview process (Merriam & Tisdell, 2016). These were expanded upon after the interview is complete.

Figure 1

Cultural Historical Activity Theory Generic Model



Selected methods for data processing and analysis were applied to Saldaña's (2016) framework of first cycle coding and second cycle coding. Quantitative data from the online survey were analysed during first cycle coding (Fraenkel et al., 2012) and revisited throughout data processing. First cycle coding methods included a priori, attribute, and In vivo coding using NVivo 12 software. Second cycle, or pattern, coding identified repetitive occurrences and combined those codes into a smaller number of categories. From here, themes were delineated.

Results

This study identified six key findings. First, technology was being used by K-12 teachers with comfort and on a frequent basis prior to ERT. However, misconceptions surrounding digital technology and digital pedagogy within the K-12 teaching profession exist. Second, three digital technologies—cloud computing productivity and collaboration tools, LMS, and video lectures—were reported as being used at a high rate prior to ERT. Third, most digital technologies introduced for ERT remained in teacher practice when upon returning to in-person learning. Of interest, when combined with data of what was in use prior to ERT, three digital technologies indicate high adoption rates: cloud computing productivity and collaboration tools at 100% (*n* = 24), LMS at 96% (*n* = 23), and video lectures at 84% (*n* = 21). Video conferencing software had the largest increase in adoption, in use prior to ERT with 21% (*n* = 5) of survey participants and added/retained with 66.5% (*n* = 16) for a total of 87.5% (*n* = 21). Fourth, many teachers indicated growth in their skills and use of digital technologies after experiencing ERT. Fifth, teachers perceived growth in student communication and collaboration skills through the use of digital tools, such as Zoom, Jamboard, and Google Slides. Last, findings indicated digital access barriers experienced by both teachers, students and families, which have begun to influence teacher decision-making processes. Teachers noted one key area of tension that was

outside of their purview was related to district rules that controlled teacher access to desired digital technologies. This determined technology teachers could integrate into their practice. Pertaining to students and families, participants shared that a deeper understanding of what is accessible at home has influenced types of at-home learning assignments are assigned.

Summary

This study aimed to better understand the impact of ERT occurring between March 2020 and September 2022 on digital technology use in K-12 teacher practice. Findings indicate K-12 teachers use digital technology and digital pedagogy in their practice. As well, ERT has resulted in growth of teacher use and skill of technology. Last, since experiencing ERT, teachers have a deeper understanding of digital access barriers. A digital divide, specifically digital access, remains a challenge in K-12 education, with district rules, policies, and initiatives posing challenges to teacher access and use of digital technology. Overall, the use of digital technologies during ERT has changed had a lasting impact on K-12 teacher practice.

Author's Contributions

AH conducted this research and was the sole contributing author.

Open Researcher and Contributor Identifier (ORCID)

Amber Hartwell https://orcid.org/0009-0008-8261-4941

Acknowledgements

Thank you to the teachers who volunteered for this study.

Ethics Statement

Ethical approval for this proceeding was obtained from the University of British Columbia (REB22-0481).

Conflict of Interest

The author does not declare any conflict of interest.

Data Availability Statement

Data is not available as per ethics agreement for this study. The author has taken responsibility for ensuring that all steps necessary to protect the privacy of human research subjects have been taken.

References

B.C. Ministry of Education. (2020a, March 27). *Supporting the K-12 education response to Covid-19 in B.C.: Integrated planning framework for school districts and independent school authorities*. Government of British Columbia. https://www.sd35.bc.ca/wp-content/uploads/sites/2/2020/08/COVID19_OperationalGuidelnesK12_08172020.pdf

B.C. Ministry of Education. (2020b, May 6). *Measured approach to phasing in a return to learning in classrooms*. Government of British Columbia. http://www.cupe15.org/sites/all/files/Measured%20Approach%20to%20Phasing%20in%20a%20Return%20to%20Learning%20in%20Classrooms.pdf

Black, E., Ferdig, R., & Thompson, L. A. (2021). K-12 virtual schooling, COVID-19, and student success. *JAMA Pediatrics*, *175*(2), 119–120. https://doi.org/10.1001/jamapediatrics.2020.3800

Engeström, Y. (1987). *Learning by expanding: An activity-theoretical approach to developmental research.* Orienta-Konsultit.

Engeström, Y. (2014). *Learning by expanding.* Cambridge University Press. https://doi.org/10.1017/CBO9781139814744

Ewing, L.-A. & Cooper, H. B. (2021) Technology-enabled remote learning during Covid-19: Perspectives of Australian teachers, students and parents. *Technology, Pedagogy and Education, 30*(1) 41–57 https://doi.org/10.1080/1475939X.2020.1868562

Fraenkel, J., Wallen, N., & Hyun, H. (2012). *How to design and evaluate research in education* (8th ed.). McGraw-Hill.

Hinshaw, D. (2020, March 16). *Record of decision - CMOH order 01-2020*. Alberta Health. https://open.alberta.ca/dataset/d7e19190-89ac-4383-b148-76aafe905e69/resource/441334a7-5fbb-4230-ab2b-61751064d23e/download/health-cmoh-record-fof-decision-cmoh-01-2020.pdf

Jimoyiannis, A., Koukis, N., & Tsiotakis, P. (2021). Rapid design and implementation of a teacher development MOOC About emergency remote teaching during the pandemic. In A. Reis, J. Barroso, J. B. Lopes, T. Mikropoulos, & C.-W. Fan (Eds.), *Technology and innovation in learning, teaching and education* (pp. 330–339). Springer International Publishing. https://doi.org/10.1007/978-3-030-73988-1_26

Koszalka, T. A., & Wu, C. P. (2004). A Cultural Historical Activity Theory [CHAT] analysis of technology integration: Case study of two Teachers. *Association for Educational Communications and Technology*.

Merriam, S. B. & Tisdell, E. J. (2016). *Qualitative research: A guide to design and implementation* (4th ed.). Jossey-Bass.

Noor, S., Isa, F. Md., & Mazhar, F. F. (2020). Online teaching practices during the COVID-19 pandemic. *Educational Process: International Journal, 9*(3), 169–184. http://dx.doi.org/10.22521/edupij.2020.93.4

Saldaña, J. (2016). *The coding manual for qualitative researchers* (3rd ed.). Sage.

Shamir-Inbal, T., & Blau, I. (2021). Facilitating emergency remote K-12 teaching in computing-enhanced virtual learning environments during COVID-19 pandemic: Blessing or

curse? *Journal of Educational Computing Research*, *59*(7), 1243–1271. https://doi.org/10.1177/0735633121992781

Trust, T., & Whalen, J. (2020). Should teachers be trained in emergency remote teaching? Lessons learned from the COVID-19 pandemic. *Journal of Technology and Teacher Education, 28*, 189–199. https://www.learntechlib.org/primary/p/215995/

Trust, T., & Whalen, J. (2021). Emergency remote teaching with technology during the COVID-19 pandemic: Using the whole teacher lens to examine educator's experiences and insights, *Educational Media International, 58*(2), 145-160. https://doi.org/10.1080/09523987.2021.1930479

United Nations (2020). *Policy brief: Education during COVID-19 and beyond*. United Nations. https://www.un.org/development/desa/dspd/wp-content/uploads/sites/22/2020/08/sg_policy_brief_covid-19_and_education_august_2020.pdf

Vygotsky, L. S. (1986). *Thought and language* (A. Kozulin, Ed., Trans.). MIT Press. (Original work published 1934).

Yao, J., Rao, J., Jiang, T., & Xiong, C. (2020). What role should teachers play in online teaching during COVID-19 pandemic? Evidence from China. *Science Insights Education Frontiers, 5*(2), 517–524. https://doi.org/10.15354/sief.20.ar035