Content Analysis of Digital Tools Use During 2020-21 Remote Teaching

Michelle Arroyo, Linda Quinn, Lois Paretti and Karen Grove

University of Nevada, Las Vegas USA

Abstract: *Elementary teachers and preservice elementary teachers, provided data regarding their use of digital tools to reach, teach and engage their elementary students during remote teaching. This study examined the tools that were most likely to continue to be useful during face-2-face teaching. In addition, the study attempted to analyze the ways knowledge of digital tools can promote teacher learning and an increase in teaching expertise. The variety of tools used, their common use among the teachers, and the extent to which the teachers believe the tools encouraged student learning are provided.*

Keywords: Digital Tools, Remote Teaching & Learning

BACKGROUND OF THE STUDY

School closures due to the COVID-19 pandemic created an unprecedented challenge to schools, districts, teachers, parents, and students across the nation. (Hartshorne, Baumgartner, Kaplan-Rakowski, Mouza, & Ferdig, 2020). However, creative methods of teaching emerged from this rapid switch to virtual teaching as teachers worked independently and in teams to determine which programs and online platforms worked best for specific groups of students. Teachers gathered numerous resources to support student learning and to encourage student-to-student discussions. Teachers learned ways that technology could increase the permeability of education.

For this study, we reviewed the digital tools that teachers and preservice teachers found most helpful in teaching remotely. Seventy-six elementary teachers in a graduate course on curriculum development, and 110 preservice elementary teachers in a preservice program shared their discoveries and use of the digital tools that helped them engage with students during remote instruction. We examined those tools that are most likely to be useful now that face-2-face teaching has resumed. We also attempted to analyze the ways knowledge of digital tools can promote teacher learning and an increase in teaching expertise.

RELEVANT LITERATURE SUPPORTING THE STUDY

As teachers gain experience teaching virtually, they develop new skills in online education and expand their abilities to reach all students individually (Affinito, 2018). Teaching skills in the traditional, face-to-face school setting do not necessarily translate well to the virtual setting. In remote education, the teacher is as distant from the learners as the learners are from one another.

Correspondence concerning this article should be addressed to Michelle Arroyo, E-mail: michelle.arroyo@unlv.edu

Educative interactions among learners and teachers in the virtual environment require more flexibility and adaptability than in a traditional classroom (Henriksen, Creely, & Henderson, 2020). Lesson flow is important (Simmons, 2020). Some skills need to be tweaked or expanded. Huggett (2020) identifies three key differences:

- The role of technology—while a face-to-face instructor might use technology, in the virtual classroom, technology becomes the main platform
- Engaging learners—different strategies are needed to engage and build a rapport with learners the instructor cannot see
- Multitasking—instructors need to simultaneously present, engage learners, and use the technology platform.

Unique changes were made to the classroom such as teaching synchronously with video conferencing tools, providing instruction asynchronously with prerecorded tutorials, and setting up a well-organized digital classroom. "Teachers can personalize online learning platforms and management systems, such as Google Classroom or Class Notebook, to target certain grade levels, subject matter, curriculum standards, and teaching preferences" (Vermette, McGrenere, Birge, Kelly, & Chilana, 2019). Teachers were challenged with moving their face-2-face courses to a fully online environment. Students and parents and/or guardians were also new to remote learning so in addition to teachers trying to prepare their classes for this type of learning, they had to be flexible and keep an open mind while everyone adjusted.

Another challenge for teachers was their own technology abilities. Prior research in education has explored various individual and external factors that affect teachers' motivation to adopt and integrate technology into the classroom. "Teachers' decisions have been shown in surveys to be strongly influenced by their confidence and computer self-efficacy educational beliefs and attitudes relating to technology and skills or experience with technology in general" (Vermette, et al., 2019). Teachers were forced to explore technology on their own and find what worked well for them and their students. As teachers progressed through this new type of teaching and learning, they found tools that would help them be the most effective when teaching material that allowed students to interact with them and their peers.

PURPOSE OF THE STUDY

The purpose of the study was to examine the digital tools that elementary teachers and preservice teachers found and used most often during remote teaching. Data were collected from 76 in-service teachers and 110 preservice teachers via journal reflections or lesson plans they prepared and integrated the technology tools into. The questions that guided data collection were: 1) What digital tools did teachers use most often to support learning in their remote classrooms? 2) What content areas were the digital tools used for? 3) Were the digital tools used for anything other than instruction? The study also examined the differences between the digital tools that preservice teachers used and those used by in-service teachers.

RESEARCH METHODOLOGY AND FINDINGS

Tabulating the type and frequency of digital tools teachers used during remote teaching provided a content analysis of those tools most likely to support learning in elementary classrooms. By using content analysis as a method, the relationship between the digital tools and remote teaching were studied. Content analysis allowed us to recognize the frequency of use of specific

digital tools and the relationship to that of student learning and understanding using these tools. The graphs represent 1) Digital tools used by discipline 2) Digital tools used by grade level. 3) Digital tools used by purpose in the classroom. Figures below show findings that were analyzed.
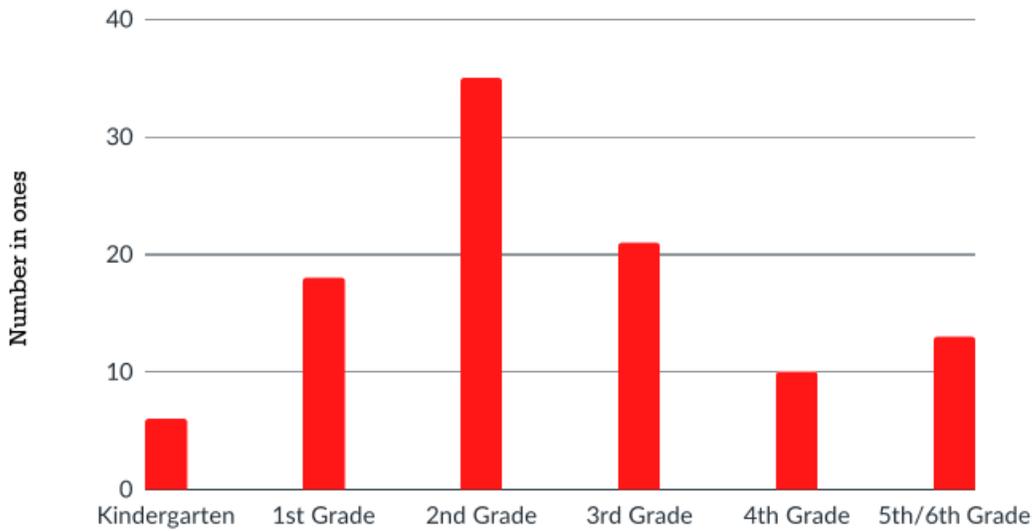
Figure 1
Digital Tools Used by Discipline
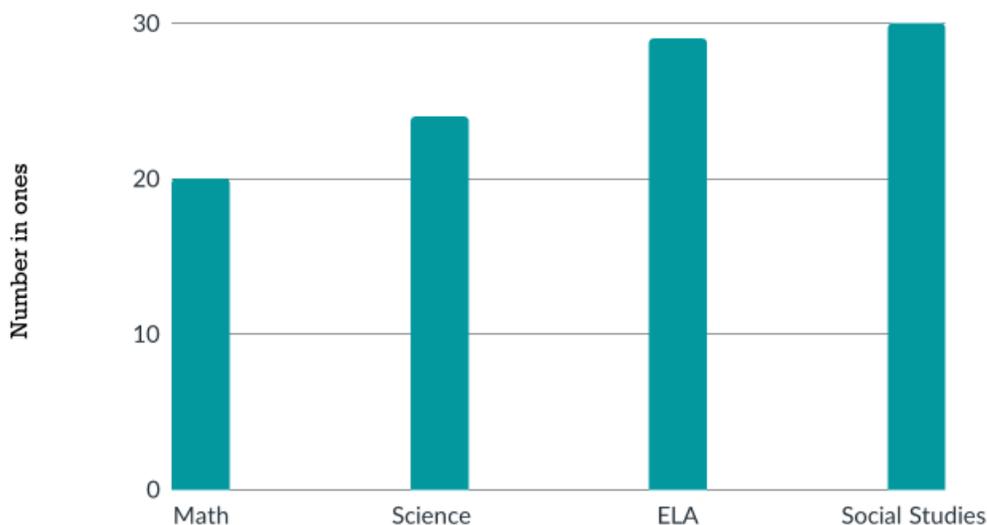
Note. Social studies lessons outnumbered all disciplines with 30 lessons incorporating digital tools. Reading, writing, and language were grouped as ELA (English Language Arts) and had 29 lessons. Technology was used by both teachers and students during the lessons. Content areas were only noted in preservice teacher data.

Second grade teachers and preservice teachers used digital tools more frequently than other grade level teachers. 35 preservice teachers and 13 in-service teachers incorporated digital tools in their lesson plans to engage and involve online learners. Nearpod was the most used digital tool used with nine preservice teachers and four in-service teachers using it to present lessons and encourage participation from online students. Nearpod helps educators make any lesson interactive whether in the classroom or virtual. Teachers can create interactive presentations that can contain quizzes, polls, videos, collaborate boards, and more.

A primary use of technology for preservice teachers was for assessment. Quizizz and Kahoot! were often used to access prior knowledge or for an end of lesson summative assessment. In-service teachers utilized digital tools such as Google Meets and Class Dojo to communicate with students, assess student learning, and communicate with parents. Teachers mentioned that they used technology to make it possible for them to meet with individual students. Many of the teachers stated that they used digital tools to track student progress and to engage students. Teachers also used technology to build a blended learning environment.

Figure 2

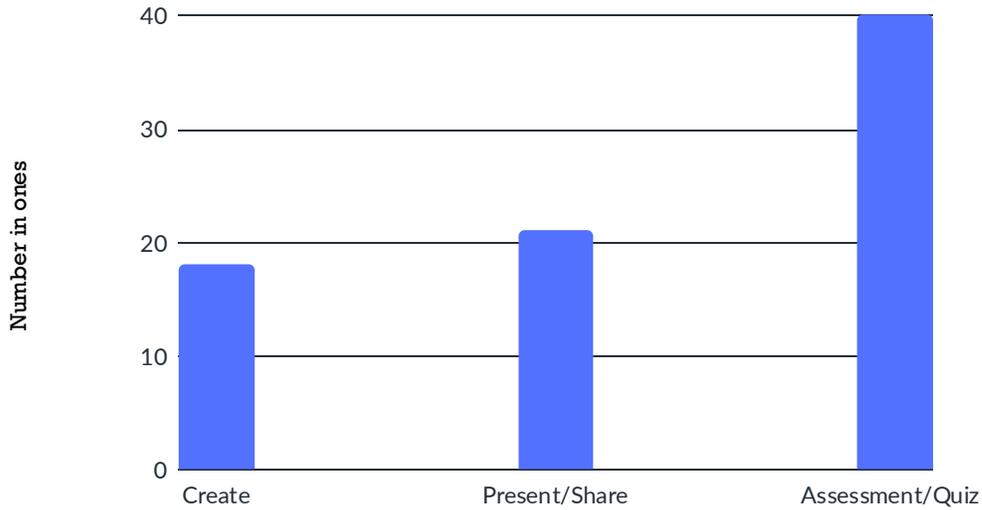*Preservice Teacher Digital Tools used by Grade Level*

Note. Second grade preservice teachers used digital tools in their lesson more frequently than preservice teachers in the other grades.

Figure 3

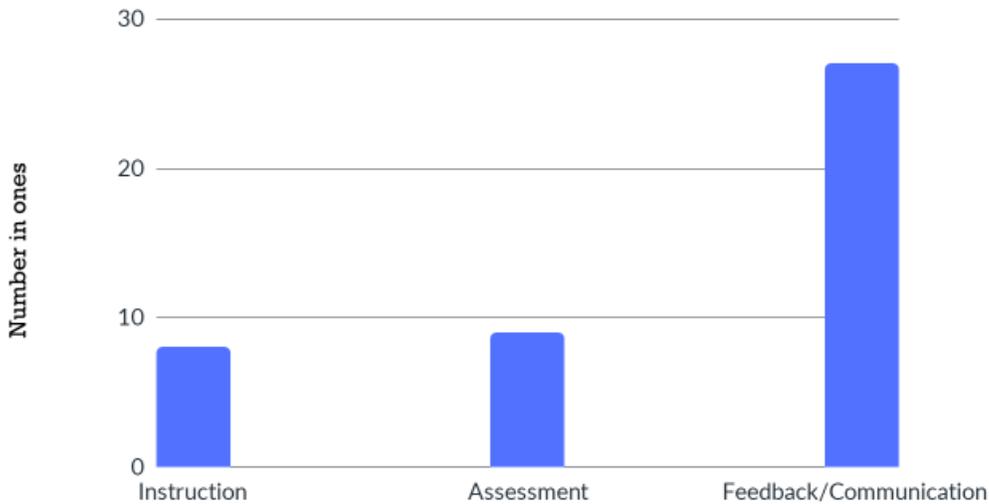*In-service Teacher Digital Tools used by Grade Level*
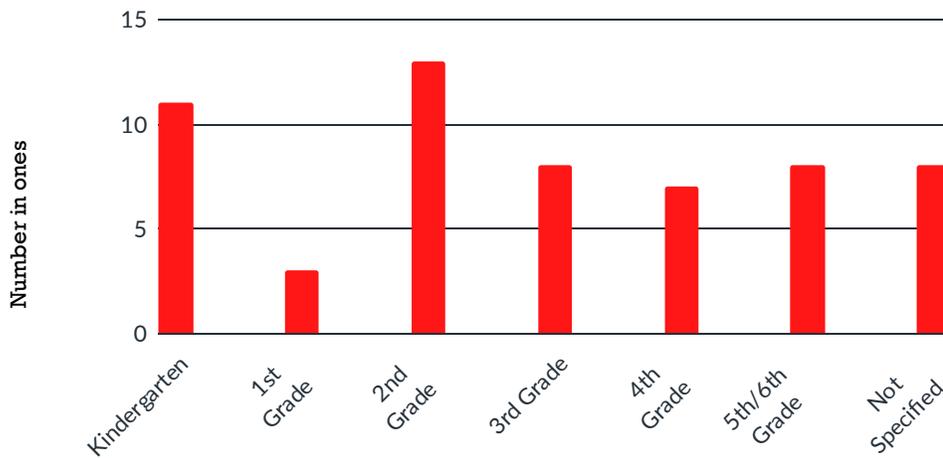
Note. Second grade in-service teachers used digital tools in their lessons more frequently than in-service teachers in other grades.

Figure 4

Preservice Teacher Digital Tool Purpose in 2020-2021

Note. Preservice teachers used digital tools for assessment, to create lessons, and for students to present and share their learning.

Figure 5

In-service Teacher Digital Tool Purpose in 2020-2021

Note. In-service teachers used digital tools to provide feedback and communicate with students and parents, for assessment, and to help with instruction.

Quizizz is an online assessment tool that allows teachers and students to create and use one another's quizzes. After providing students with a unique access code, a quiz can be presented live as a timed competition or used for homework with a specific deadline. Kahoot! is a game-based learning platform, used as educational technology in schools and other educational institutions. Its learning games, "Kahoots", are user-generated multiple-choice quizzes that can be accessed via a web browser or the Kahoot app.

In Google Meet, teachers can start an impromptu meeting or one that they previously set up. After teachers start the meeting, they can share the joining information with students in a classroom post or message. ClassDojo is a school communication platform that teachers, students, and families use every day to build close-knit communities by sharing what's being learned in the classroom home through photos, videos, and messages. Teachers use Class Dojo to promote positive behaviors in their classroom and to strengthen lines of communication between school and home.

CONCLUSION

During the rapid switch to virtual teaching and learning, teachers tried a variety of digital tools to teach and engage their students. Based on our findings, preservice and in-service teachers used digital tools primarily as a means of assessment. However, digital tools provide a myriad of resources that can be used to promote learning in both remote and face-2-face settings. A discussion of the types of digital tools viewed as most useful in virtual classrooms may provide educators at all levels with information to promote the integration of digital tools in traditional, face-2-face classrooms. As teachers gain experience teaching virtually, they develop new skills in online education and expand their abilities to reach all students individually (Affinito, 2018).

REFERENCES

Affinito S. (2018). Literacy coaching: Transforming teaching and learning with digital tools and technology.

Hartshorne, R., Baumgartner, E., Kaplan-Rakowski, R., Mouza, C. & Ferdig, R.E. (2020). Special Issue Editorial: Preservice and Inservice Professional Development During the COVID-19 Pandemic. Journal of Technology and Teacher Education, 28(2), 137-147. Waynesville, NC USA: Society for Information Technology & Teacher Education. Retrieved June 21, 2021, from https://www.learntechlib.org/primary/p/216910/.

Henriksen, D., Creely, E. & Henderson, M. (2020). Folk Pedagogies for Teacher Transitions: Approaches to Synchronous Online Learning in the Wake of COVID-19. Journal of Technology and Teacher Education, 28(2), 201-209. Waynesville, NC USA: Society for Information Technology & Teacher Education. Retrieved June 21, 2021 from https://www.learntechlib.org/primary/p/216179/.

Huggett. C. (2020). https://www.cindyhuggett.com/blog/2020sovt/

Simons, C. (2020). Pacing Lessons for Optimal Learning. Educational Leadership, Online June 2020, Volume 77, 46-52. Retrieved from http:// www.ascd.org/publications/educational-leadership/ jun20/vol77/num09/toc.aspx. Journal of Teacher Education63(3) 185–200© 2012 American Association of Colleges for Teacher Education Reprints and permission:sagepub.com/journalsPermissions.navDOI: 10.1177/0022487111433651http://jte.sagepub.com

Vermette, L., McGrenere, J., Birge, C., Kelly, A., & Chilana, P. K. (2019, May). Freedom to personalize my digital classroom: Understanding teachers' practices and motivations. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (pp. 1-14).