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Challenges of Remote Teaching for K-12 Teachers During COVID-19

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CHALLENGES OF REMOTE TEACHING FOR K-12 TEACHERS DURING COVID-19

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Abstract

During the Coronavirus disease pandemic (COVID-19) remote learning presented many new challenges for K-12 teachers, and likely presented unique challenges for different content areas and grade levels. To investigate this problem, a survey-based quantitative study was conducted. A total of 831 teachers in a midwestern state completed a survey on the challenges of remote teaching. Results found (1) areas expected to present challenges that did not, (2) challenges that surfaced for teachers regardless of the grade level or content they taught, and (3) challenges that were experienced differently by teachers within educational levels and/or content areas. Continued exploration of how districts and other agencies can help teachers implement remote teaching will be helpful for the short term, and perhaps the long term, as benefits of remote teaching are documented.

Introduction

The Coronavirus disease pandemic (COVID-19) impacted life across the world in the spring of 2020 (Center for Disease Control and Prevention, 2020). While businesses closed and society was limited to essential activities, such as grocery shopping and getting medical supplies, K-12 schools were expected to continue functioning remotely (Oprysko, 2020; Tabachinik, 2020). Many schools had little notice in switching from in-person to fully online/remote, with some teachers having only a weekend to prepare entirely new lesson plans for teaching their students in a new format (Herold, 2020).

Remote learning most often consisted of fully online instruction, using video conferencing platforms, such as Zoom or Google Meets, and learning management systems, such as Google Classroom, Canvas, or SeeSaw, to post assignments and video lectures (Lieberman, 2020). Many teachers had never taught online, and had never used the platforms and systems necessary to teach online successfully (Herold,

2020). Remote learning presented many new challenges for teachers, and likely presented unique challenges for different content areas and grade levels.

The purpose of this study is to examine the challenges that teachers experienced in teaching remotely during the COVID-19 pandemic, and specifically what challenges differed by education level and content area. For the purpose of this study, elementary is defined as early childhood through fifth grade while secondary is defined as sixth through 12th grade. Content area is divided into core and specials, with core referring to required classes that are considered the foundation of students' learning. Specials are the additional subjects taught, often physical education, art, and music, as well as other electives at the secondary level. For this study, teachers who indicated that they taught English, math, science, or social studies were considered to be core teachers.

The current study investigated the following research questions:

1. What challenges to remote teaching were identified by teachers?

2. Were there associations between challenges faced based on education level taught (elementary versus secondary)?

3. Were there associations between challenges faced based on content area taught (core versus specials)?

4. Were there associations between challenges faced based on both education level taught and content area taught (elementary core versus elementary specials, and secondary core versus secondary specials)?

Literature Review

Challenges of Teaching in K-12 Schools

Teaching in the United States is already a difficult and demanding job without suddenly switching to a new format. A survey of 5,000 K-12 teachers found that teachers had more mental health issues and higher stress levels than most other professions (American Federation of Teachers, 2017). There are decades of research detailing the challenges that teachers experience, including lack of support from supervisors, difficult classroom behaviors, and administrative roadblocks (Burke, 1996). Many teachers also experience poor work-life balance, frustration about the circumstances of their work, and feelings of social isolation (Bullough, 1987; Coats & Thoresen, 1978: Rosenholtz, 1989). These challenges take their toll on teachers' mental health, with one study finding that teachers who have experienced burnout also display many symptoms of depression (Shin, Noh, Jang, Park, & Lee, 2013). The stress of teaching can also have immediate impacts on teachers. One study found that, despite beginning the year with a strong belief in their ability to persevere and succeed, many first-year teachers ended the year feeling burnt out and highly stressed from the challenges they faced (Lavian, 2012). These feelings are often a precursor to leaving the teaching profession (Lavian,

2012). Turnover is not just an issue for first year teachers though, as teachers have been found to have a higher turnover rate than many other professions, such as engineers, police officers, and nurses (Ingersoll & Perda, 2014).

Challenges of Teaching Remotely

Although research on remote teaching during the COVID-19 pandemic is currently emerging, there is past research that details some of the challenges of teaching online. Most of this research is at the university level, but many of the challenges outlined would likely apply to K-12 education as well.

An in-depth analysis of an interview with an instructional designer and online language teacher outlined some of the challenges of online instruction (De Paepe, Zhu, & DePryck, 2018). These challenges included: struggling to get students to engage with coursework, a lack of adequate professional development and training for teaching online, and difficulty getting students to collaborate with each other. Another challenge that teachers face is that they are unfamiliar with many of the online platforms that are used for teaching remotely (Mupinga, 2005). This may be the result of a lack of training and professional development, as noted by De Paepe et al. (2018).

A challenge that teachers face already with in-person learning is their students' access to technology and ability to navigate that technology (Shank & Cotten, 2013). These barriers are referred to as the "digital divide," and there are considered to be two levels of digital divide factors. The first level of digital divide factors refers to access to technology, while the second level refers to the ability to effectively navigate technology (Shank & Cotten, 2013). Many districts provided students with digital devices and Wifi hotspots during remote learning in the spring (Doiron & Marsigliano, 2020). However, not all students understand how to use these devices, leading to challenges for both students and teachers (Blagg & Luetmer, 2020). In addition, the digital divide can also be applied to teachers, with teachers having varying levels of comfort with using technology and using technology specifically for teaching (Saad & Sankaran, 2020).

While we would expect some of these challenges to also apply to remote teaching during the COVID-19 pandemic, teaching remotely during a pandemic likely presents even more challenges. Under normal circumstances, teachers have more time for preparing and planning lessons, and are not dealing with the stress and possible trauma of living through a pandemic. Remote teaching during the COVID-19 pandemic is a unique circumstance that requires further investigation to understand the challenges that teachers face.

Research on remote teaching and learning by different age levels and content areas is limited, likely because remote instruction is not often used with younger students or to teach topics such as art, drama, or music (Dammers, 2012; Gallup, 2019). Research on remote teaching during a pandemic in the United States is currently emerging. A recent study interviewed elementary teachers to investigate their experiences of remote learning during the pandemic. Teachers reported that they had limited resources for

converting their lessons to online formats and implementing remote learning (Anderson & Hira, 2020). Another article shared initial insights about remote chemistry classes at the high school level, stating that the remote format was much more difficult than hands-on laboratory instruction for teachers and students (Kelley, 2020). However, direct comparisons of elementary and secondary have yet to be made. It would be anticipated that teachers would experience different challenges with implementing remote learning based on the age level they teach and the content that they teach.

Method

This survey-based quantitative study sought to investigate the challenges faced by K-12 teachers in switching to remote teaching during the COVID19 pandemic in spring 2020. Institutional review board approval was obtained for this study from the authors' institution.

Participants

A total of 19,574 potential participants with an active teaching license were initially identified, but 683 of those had email addresses that were not functional, resulting in a total of 18,891 potential participants who received the survey via email. A total of 831 of these potential participants completed the survey, yielding a .04% response rate. While this is a low response rate, a sample size of over 800 during a pandemic still provides adequate useful data for this study.

As part of the demographic portion of the survey, participants were prompted to indicate whether they currently taught at the elementary or secondary level in a public-school district. In order to better compare results from elementary and secondary teachers, the sample included teachers who indicated that they taught only elementary or only secondary. After filtering out participants who taught both elementary and secondary, as well as those who indicated they were not currently teaching, this further narrowed down the sample to 604.

Of the 603 participants who indicted their gender identity, 75.5% of the sample identified as female, 24.0% identified as male, and less than 1% identified their gender identity as "other." The majority of the sample (94.5%) identified their race as White, 1.5% identified as American Indian or Alaskan Native, 1.3% identified as Black or African American, and 1.0% identified as Asian. Additionally, 8.9% of participants reported that they were of Hispanic, Latinx or Spanish origin.

The sample included a variety of age ranges, including 24% 18-34 year-olds, 27.5% 35-44 year-olds, 29.0% 45-54 year-olds, 17.4% 55-64 year-olds, and 2.0% 65+ year-olds. Years of experience teaching ranged from 1 year to 41 years, with a mean of 15 years' experience teaching. 58.3% of participants taught at the secondary level (sixth through 12th grade), while 41.7% taught at the elementary level (early childhood through fifth grade). The majority (81%) of participants taught core subjects (e.g., math, literacy, science), while 19.2% taught specials subjects (e.g., art, music, drama).

Procedure

Using a public website, email addresses were obtained for K-12 teachers in a midwestern state. After approval was granted from the authors' institutional review board, the survey was distributed via email using Research Electronic Data Capture (REDCap; Harris et al., 2009). REDCap is a secure web-based survey and data capture tool which provides an interface for validated data entry, audit trails to keep records of data manipulation and export, and data exporting capabilities to commonly-used statistical software packages. The survey took approximately 5-10 minutes for participants to complete.

Instrument

The survey included three sections: the Professional Quality of Life Scale (ProQOL5; Stamm, 2010), the EDUCAUSE DIY Survey Kit: Remote Work and Learning Experiences (EDUCAUSE, 2020), and a section with demographic questions. Results from the ProQOL5 are reported elsewhere (Leech, Benzel, Gullett, & Haug, 2020). This study reports primarily on results from the EDUCAUSE DIY Survey Kit: Remote Work and Learning Experiences. This section of the survey was developed by EDUCAUSE, a nonprofit information technology association, as a way for educators to collect program improvement data in response to the COVID-19 pandemic. The EDUCAUSE DIY Survey Kit: Remote Work and Learning Experiences instrument includes a section of student-centered questions, faculty-centered questions, and staff-centered questions. The survey used in this study included only the faculty-centered questions. This portion of the survey included four questions regarding challenges that teachers faced when switching to remote instruction. Each of the four questions included a list of potential challenges where participants were prompted to check all that apply; that is, from the list of potential challenges faced in the sudden switch to remote instruction, participants checked all the challenges they felt they had experienced.

Analysis

After data were imported from REDCap (Harris et al., 2009) to IBM SPSS version 26, the percentages of participants who reported experiencing each challenge were calculated. Next, the sample was broken down by education level taught (elementary versus secondary), by content area taught (core versus specials), and by both education level and content area (elementary core versus elementary specials; secondary core versus secondary specials) and percentages of participants who reported experiencing each challenge were calculated. This analysis provided descriptive data to better understand which challenges each group experienced when switching to remote teaching.

Next, chi-square tests of association were calculated to compare groups. The use of chi-square analysis is appropriate in this study because data were frequencies of responses (i.e., number of participants who indicated they experienced a certain challenge) separated by categorical variables (i.e., education level taught and content

area taught). Chi-square analyses require categorical variables and chi-square results indicate whether there are associations between variables or not by comparing expected frequencies with observed frequencies.

Using IBM SPSS version 26, chi-square analyses for each challenge were calculated for elementary versus secondary teachers, core versus specials teachers, elementary core versus elementary specials teachers, and secondary core versus secondary specials teachers. Chi-square assumptions were tested and met. For chi-square results that were statistically significant, standardized residuals were examined to determine which group was different than expected; Agresti's (2007) cutoff of standardized residuals +/- 2.0 was used to determine which groups were different than expected.

Results

There were four research questions under investigation in this study. The results are presented by research question in order to align the outcomes.

1. What challenges to remote teaching were identified by teachers?

Table 1 shows descriptive data indicating the percentage of all participants who indicated they experienced each challenge, listed in descending order. Across grade levels and content areas, 78.5% of teachers had a preference for face-to-face learning. They struggled most often with supporting students in engaging in remote learning, with 77.6% of teachers indicating that their students were uncomfortable or unfamiliar with the necessary technologies and 71.4% indicating that students had not been adequately available or responsive. Many teachers also struggled with transitioning their lessons to a remote format, with 54.8% indicating that lessons and activities hadn't translated well to remote and 53.5% reporting that they struggled with finding adequate replacements for in-person teaching tools.

- **Table 1 -** See attachments

2. Were there associations between challenges faced based on education level taught (elementary versus secondary)?

Table 2 shows the percentage of participants who indicated they experienced each challenge, broken down by education level taught (elementary versus secondary), and also indicates which chi-squares yielded statistical significance and which groups were different than expected. For the challenge, "my access to library resources," chi-square results were significant at the 0.001 level, and standardized residuals indicated that more elementary teachers experienced this challenge than expected, while fewer secondary teachers experienced this challenge than expected. For the challenge, "my own discomfort or lack of familiarity with required technologies or applications," chi-square results were significant at the 0.001 level, and standardized residuals indicated that more elementary teachers experienced this challenge than expected when compared with secondary teachers. For the challenge, "I have limited knowledge of

options for online course delivery," chi-square results were significant at the 0.001 level, and standardized residuals indicated that more elementary teachers experienced this challenge than expected when compared with secondary teachers. For the challenge, "My access to reliable communication software/tools (e.g., Zoom, Skype, Google)," chi-square results were significant at the 0.05 level, and standardized residuals indicated that more elementary teachers experienced this challenge than expected when compared with secondary teachers.

- **Table 2 -** See attachments

3. Were there associations between challenges faced based on content area taught (core versus specials)?

Table 3 shows the percentage of participants who indicated they experienced each challenge, broken down by content area taught (core versus specials). When comparing these groups, no chi-square results were statistically significant, indicating that there is not an association between content area taught and challenges experienced.

- **Table 3 -** See attachments

4. Were there associations between challenges faced based on both education level taught and content area taught (elementary core versus elementary specials, and secondary core versus secondary specials)?

Table 4 shows the percentage of participants who indicated they experienced each challenge, broken down by both education level taught and by content area taught (elementary core versus elementary specials, as well as secondary core versus secondary specials), and also indicates which chi-squares yielded statistical significance and which groups were different than expected. For the challenges, "my access to reliable communication software tools (e.g., Zoom, Skype, Google)" and, "I have limited personal time or energy to effectively adapt," chi-square results were significant at the 0.05 level, and standardized residuals indicated that fewer elementary specials teachers experienced this challenge than expected when compared with elementary core teachers. For the challenge, "course lessons or activities haven't translated well to a remote environment," chi-square results were significant at the 0.05 level, and standardized residuals indicated that more secondary specials teachers and fewer secondary core teachers experienced this challenge than expected when compared with each other.

- **Table 4 -** See attachments

Discussion

Early research from remote teaching during the pandemic has suggested that teachers need more support in implementing remote learning and using technology effectively to create online lessons (Anderson & Hira, 2020). In order to best support teachers during

remote teaching, it is important to understand what challenges they experienced while implementing remote learning in the spring. Chi-square results, indicating whether two categorical variables are related in a significant way and whether the difference between how many times a phenomenon is expected to happen and how many times it actually happens is statistically significant, can aid in identifying areas where additional teacher and student support may be needed. The following paragraphs address findings according to (1) areas expected to present challenges that did not, (2) challenges that surfaced for teachers regardless of the grade level or content they taught, and (3) challenges that were experienced differently by teachers within educational levels and/or content areas.

A group of potential challenges related to access to hardware devices, software tools, and reliable services did not present widespread problems for teachers, indicating that most teachers felt like they had the technological infrastructure and tools for remote teaching. One way to interpret this is that largely these teachers did not struggle with first level digital divide issues (Shank & Cotten, 2013) of access to and ownership of technology and infrastructure.

The availability of the appropriate technological tools is necessary, but not sufficient, for remote teaching. Several challenges were experienced related to familiarity with and quality of using these technology tools, indicative of second level digital divide issues. Some challenges were experienced by high percentages of teachers regardless of subject area or education level taught. Most teachers were teaching remotely rather reluctantly and had a preference for face-to-face learning. Approximately three out of four teachers reported that their students were unprepared, lacking familiarity with required technologies and applications, which may seem surprising for a generation of students who are digital natives. However, the digital divide also applies to students, because of inequities in access to technology and limited understanding of how to navigate technology among students (Shank & Cotten, 2013).

The use of learning tools, such as learning management systems and remote conferencing applications, often required students to put their devices to new purposes. Keeping students engaged was often a challenge for the vast majority of teachers, which may be related to students' unfamiliarity with how to use the tools. Similarly, it could be related to the problems teachers reported having when trying to implement their lessons online. Over half of teachers indicated that their lessons did not translate well to remote learning, echoing findings from initial research on remote learning during the COVID19 pandemic (Trust & Whalen, 2020), and reported that they were unsure how to assess student learning in this environment. These findings support other recent studies reporting that hybrid and remote learning were more difficult than face-to-face learning for both students and teachers (Raes et al., 2020).

Group differences were found when comparing education levels and when comparing core and specials teachers within educational levels. Elementary teachers struggled with their lack of access to library resources and reliable online communication software, their limited knowledge about online teaching, and general discomfort with

required technology and applications. In comparison, secondary teachers were not negatively impacted by the unavailability of library resources, indicating less reliance. Elementary teachers seemed to have had less familiarity and knowledge of the technologies, applications, and methods required for doing online teaching than secondary teachers, suggesting that more training and support is warranted for elementary teachers in an online environment.

Interestingly, there were no significant differences in challenges experienced by K-12 core teachers and those who taught specials, but differences did appear when educational levels were looked at separately. At the elementary level, specials teachers were less impacted by software access and less personally drained by the switch to remote teaching than were their core subject elementary colleagues. Earlier research documenting that specials areas such as art, drama, and music and younger students are not often taught remotely (Dammers, 2012; Gallup, 2019) might suggest that elementary specials teachers would find the switch more difficult and taxing, in contrast to findings from this study. Alternative explanations could include that there was less emphasis on the importance of specials for elementary students during the pandemic, leading to fewer specials lessons being taught and fewer challenges experienced by those teachers. At the secondary level, however, specials teachers were more likely to report that their lessons or activities did not translate well to a remote environment than were their core subject secondary colleagues, possibly suggesting that secondary art, music, and drama were taught as regularly as secondary core subjects. Further exploration of the differences between levels and across subject areas can help identify where to provide targeted support.

Implications

Findings from the current study indicate that teachers may need additional supports in implementing remote teaching, especially with the use of remote teaching unclear for the 2020-21 school year. Across grade levels and content areas, teachers need additional trainings and resources pertaining to teaching and assessing learning in a remote setting. However, our results indicate that elementary teachers in particular are experiencing disproportionate challenges in this area. From an education policy standpoint, providing and protecting additional funding through legislature would be beneficial. Providing professional development to all teachers, but to elementary teachers in particular, could help to mitigate the challenges these teachers report experiencing in delivering remote instruction to their students. Technology trainings would provide the opportunity for teachers to feel more confident in their remote instruction, to provide higher quality and more effective remote instruction to their students, and to increase student learning and development. The need for this type of professional development is urgent and unlikely to resolve itself as the effects of the pandemic on K-12 education are not likely to go away anytime soon.

Additionally, teachers need to be able to support students and their families in learning about how to navigate technology and online learning platforms to be able to engage in remote learning. This indicates that additional funding is needed for schools to fund

teacher professional development, both for keeping up with new technology and new uses for that technology and for supporting students and families in navigating technology.

Limitations

There are limitations to the current study. Due to the voluntary nature of the survey and the low response rate, it is possible that those who chose to take the survey differed significantly from those that did not, which is a primary consideration. Respondents may have been those that had more time and fewer challenges, leading to some challenges being underreported. The respondents were also all from the same state, which may not capture the full experience of remote teaching during a pandemic in the United States. Every state had a different response to the pandemic and different policies in place, so teacher experiences in other states may have been inconsistent with the current study's findings (Reich et al., 2020). We know that challenges are not necessarily evenly distributed across contexts and there likely are teachers/schools/districts that experience challenges at a much higher rate than other teachers/schools/districts, which implies a need for additional studies that can disaggregate by contextual variables.

Future Research

Remote teaching will continue to an unknown extent during school year 2020-2021 and possibly beyond. As such, teachers will continue to need support, but perhaps not all teachers need the same type of support in all content areas, as this study has demonstrated. Further research is necessary to determine the types of resources and training that are required, although this study provides a snapshot of the aid that was needed and by whom when teachers were faced with remote teaching in spring 2020. This study also reveals areas that were anticipated to prove challenging that largely did not. Although the challenges that teachers face when implementing remote learning are unique, they likely contribute to teacher burnout and turnover in the same way or even more so than the challenges of in-person learning. Continued exploration of how districts and other agencies can help teachers implement remote teaching will be helpful for the short term, and perhaps the long term, as benefits of remote teaching are documented.

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