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Research Article

K-12 teacher perspectives on the pandemic pivot to online teaching and learning

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The study examines teacher perspectives on preparedness to implement the transition of over 50 million K-12 students to online and virtual teaching formats. With the onset of the COVID-19 pandemic, students were instructed to remain at home and to avoid the potential dangers of virus spread in schools. Once this transition began, and then continued on as the pandemic ignited, attention and scrutiny was aimed at how well teachers had been prepared for this shift. Relationships between these perceptions in terms of years of teaching, grade level, content area, school type, and school level were examined in this study. Over 140 teachers, ranging from kindergarten to senior English teachers completed the survey. The researchers analyzed emerged patterns and sentiment scores for the most prevalent themes. The study sought teacher perceptions of preparation as provided by schools, districts, and universities as well as perceptions on how engaged parents and students felt during this dramatic and sudden shift. Findings demonstrate that significant differences exist between how teachers perceive their levels of preparedness for teaching remotely depending on their teaching experience. It was evident that the pandemic affected K-12 school systems in one state harsher than in higher education. Conclusions from this study better inform future decisions of this nature and that could ensure higher levels of teacher preparation.

Keywords: Educational leadership; Pandemic; COVID-19; Online preparation; Pivot; School improvement

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1. Introduction

The integration of technology into K-12 teaching and learning is not a new concept. Long before the COVID-19 pandemic, technology as an instructional tool as well as a learning modality was, in some instances, continually explored and in others significantly implemented. On its website, the US Department of Education states that "Technology ushers in fundamental structural changes that can be integral to achieving significant improvements in productivity" (US Department of Education, 2019). Such was the manner in which the possible use of technology in the K-12 classroom was often described prior to the spring of 2020. Technology "could be" integral to achieving improvements in productivity through supplemental teaching resources, student virtual games or drills, and readily available classroom devices to extend school-based learning. Online

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learning was often seen as a viable option, but only if students were interested in credit recovery, facing a personal crisis or illness, or committed to a sports or work obligation that called for a more flexible schedule (Archambault et al., 2016). In terms of an instructional mainstay, the K-12 system was primarily one constituted of face-to-face instructional in tens of thousands of brick-and-mortar schools. Prior to COVID-19, the vast majority of US teachers had never taught exclusively online, yet little did they all know that within a year's time, *everyone* would be teaching online. While it is well known that "instructors should strongly consider and draw upon the varied learning styles of the students' in the classroom and assessments should remain authentic" (Eadens & Eadens, 2016, p. 351), but effectively accomplishing this suddenly during school closures and shifting to fully online appeared to be far too soon for many teachers. Yet, in the spring of 2020, the nation's schools closed. Educators switched from pedagogy to "panic-gogy" (Kamenetz, 2020), and the US K-12 education system was "blindsided" as it scrambled to address the challenge of teaching during the unprecedented pandemic (Newton, 2020). The medical community advised that students should remain in their homes, yet somehow the act of educating needed to continue. Thus, over 50 million K-12 students and their teachers switched to online and virtual modalities. Educational technology, which had previously been used as a tool with which to supplement face-to-face instruction, quickly morphed into the primary and exclusive pathway through which education could continue.

2. Literature Review

Students who started their 2019 academic year in schools would not end it the same way. By the end of March, the vast majority (from over 124,000 U.S. schools) were at home, attending virtual classes and learning exclusively via online formats (Education Week, 2020; Herold, 2020). At the point in time before COVID, there were already about 375,000 students in 32 states enrolled in statewide online schools, enrollments in which have been growing about 6 percent per year (Koenig, 2020). While recent research indicates that schools already using online instruction were more effective once the COVID transition occurred (Eroh, 2020), the fact remains that only a small percentage of K-12 students were learning full time under the online model prior to COVID. That fact leaves the vast majority of teachers without this preparation. Parents, media, and the teachers themselves were left to ponder: *Are our teachers ready for this?*

2.1. The Teacher Preparation Factor

Prior to the COVID pandemic, teacher preparation programs had primarily focused on the nuances of teaching that were most practical for face-to-face instruction. Curriculum development, instructional pedagogy, and student behavior management were mainstays for teacher preparation courses, as well as other qualities of teaching that were necessary for effective face-to-face instruction and learning. In the face of decades-old achievement gaps and an ever-expanding research base focusing on effective models of instruction, time in pre-service teaching programs was focused on proven reading strategies and the methods in reaching students from diverse populations more effectively. Online instruction was a novel notion, but for the prevalent face-to-face instructional models, it was by no means the focus of university teacher educational programs (Abernathy et al., 2021; Koenig, 2020).

In a study conducted through the Michigan Virtual learning Research Institute, only 4% of teacher preparation programs nationally noted any kind of offerings in coursework or practicums that involved teaching through online or virtual modalities. While this research was conducted in 2016, this figure represented only a slight increase over similar research conducted in 2010, during which 1.3% of respondents indicated that they had been prepared for online teaching as part of their higher education experience (Archambault et al., 2016). There can be no doubt as to the value of field experiences and explicit learning in preparing teachers for online experiences, yet, in leading up to the pandemic of 2020, the majority of teacher preparation experiences were geared towards face-to-face exclusively (Kennedy & Archambault, 2012; Kennedy et al., 2013). Thankfully,

exposure to online course engagement as part of university coursework is now more prevalent, and thus, even in the absence of explicit teacher preparation for being online instructors themselves, just the firsthand experience of taking an online course may have proven helpful in preparing for a complete and wholesale transition to online learning (Williamson, 2012).

National teaching standards have, for many years, included online teaching and learning as relevant skills for teachers to acquire and retain, especially in terms of digital pedagogy, learner engagement, diverse instruction, and community building (Virtual Learning Leadership Alliance, 2019). Other standards, such as the International Society for Technology in Education (ISTE) standards, give specific guidance to teachers in terms of short- and long-term impact and approaches in utilizing technology when teaching K-12 students (ISTE, 2020). As far back as the mid-1990s, studies and articles were pointing to the advantage of a virtual learning modality (Kennedy & Ferdig, 2018). Even still, the shift was a slow one, and in 2020, the years of non-reaction eventually caught up.

As K-12 schools across the US closed in March of 2020, based on the recommendations of the CDC as well as the mandates of governors in many states, it soon became obvious to parents, administrators, and the teachers themselves, that the nation's workforce was quite diversified in terms of readiness for the gargantuan endeavor of switching all instruction to virtual modalities (Adams, 2020). In some cases, teachers were given days to prepare, in others, weeks. As USA Today journalist Caralee Adams describes: "The varying amount of training districts provide has created a patchwork of quality and gaps in accessibility. Many teachers improvise, counting on patience from parents and students as they transition to online learning on the fly" (Adams, 2020, p. 1).

Other factors that may have influenced the degree of success with this transition would be the content area of the teacher and the years of experience in teaching. While high school students may have the innate capability, due to age and familiarity with technology, to navigate learning in a more self-directed manner, children in early education may be too young to do so. The levels of support from kindergarten to twelfth grade may be far-ranging and, in turn, impact the preparation of the teacher to deliver the support necessary for student success.

In analyzing the plight of the youngest of our learners – the kindergarten, first and second graders of our nation – and their particular transition to online learning, Newton's 2020 research is telling. In a March survey of the same year, over 1,200 K-12 teachers participated in the completion of a survey related to online learning adaptation. One significant finding was glaring – that early grade educators were feeling quite underprepared as to how to teach five- to seven-year-olds the kindergarten, first, or second-grade curriculum using an online modality (Newton, 2020). In fact, over half of the early grade participants reported that they were "unprepared" to facilitate online learning (Newton, 2020). In addition, and quite alarming as well, was the percentage of early grade teachers (almost 70%) who shared that their gameplan for delivering effective instruction to these young learners was to primarily share documents, not necessarily engage in direct instruction. Other results from the survey included a knowledge gap, on the part of teachers, as to what online tools or programs were even available for them to use.

As early as 2017, however, researchers were delving into the preparedness of schools in readying for a pandemic. The Rand Corporation, using data from K-12 educator feedback as well as from school websites, determined the degree to which schools five key indicators of pandemic preparedness: 1. Providing devices (such as laptops and tablets); 2. Training teachers on delivering online instruction; 3. Using an LMS; 4. Providing fully online or blended learning courses; 5. Establishing plans to deliver instruction during a prolonged school closure.

In 2017, only 46% of the schools analyzed had a plan for how to address learning in a pandemic. Once COVID struck, 93% of the surveyed schools acknowledged that all five of these preparedness factors had not been addressed prior to the COVID virtual transition (Dilberti et al., 2020). Of particular note in this study, as related to the research highlighted here, is that secondary schools were more likely to meet these preparedness indicators than elementary schools. For example, 24%

of the elementary principals surveyed as part of the Rand study acknowledged that none of the five indicators were addressed. Also, interestingly, the one indicator that was most prevalent in terms of schools being prepared was the first indicator - that of students being provided devices (Dilberti et al., 2020).

While preparedness and instructional preparedness were key to this transition to online teaching and learning, the related support role of teachers cannot be ignored. Teachers are many things to many students including comforter, confidante, and advocate. Teachers often are role models and advisors, in addition to instructional guides. In the words of Kim Minugh, a high school English teacher in Sacramento who transitioned to online teaching in early March, "Right now, I'm most concerned my students are mentally, physically and emotionally safe and that they know what resources are available and that they know how to reach me and other teachers, and that counselors are available" (Lambert, 2020, p. 2). While concerns over the challenges associated with student academic progress took center stage, educators across the nation also questioned their preparedness in being able to provide that supportive role from across the miles and along the digital connectivity highway. Emotional stability and the mental health of students was an added concern along with the upheaval associated with a transition of this magnitude. Along similar lines as the importance of emotional stability is the importance of relational humanity. Eadens and Eadens (2021) claimed that "relational humanity is an integral part of the faculty-student relationship; showing students they matter as humans and deepening relationships with them is a humanitarian act. The pivot forced variations, created disequilibrium, celebrated innovations, and yielded creative delivery models" (p. 277).

2.2. School - Home Challenges During the Virtual Transition

Prior to the Pandemic, most students across the nation and in all levels of schools were accustomed to using online tools for enrichment and practice purposes only. They were not prepared to use the online tools as the sole instructional tool (Moore et al., 2011). Therefore, schools across the nation were all negatively impacted by the sudden shift to online learning; however, elementary schools most likely faced the most challenges. Students in elementary school do not have the developmental skills to learn independently and were more scared during the sudden shutdown of the nation due to their age. According to Piaget (1991), students in elementary school grades are of the age where they are constructing knowledge through interaction with the world and those around them. Having students learn independently from a list of exercises or activities the teacher posts or emails or through the computer screen while the teacher is talking and modeling with little or no materials at home to practice with limits interactions and discussions; therefore, limiting learning. Middle and high school students were more mentally developed and independent in their own learning and could handle less face-to-face and explicit instruction with limited tools for practice while learning new curriculum and completing assignments.

An additional challenge in the move to online learning is the available devices for students to use at home. In the Rand research referenced earlier, conclusions from the survey indicated that 54% of elementary schools and 75% of secondary schools had devices ready and available, at the very least to those students in need (Dilberti et al., 2020). But, the distribution of devices would prove to be only part of the challenge, as connectivity issues often prevented students, even when they did have devices, from tuning in to live virtual lessons (Winther et al., 2020).

Although students may have a device and their teacher was uploading recorded lessons, sending a list of requirements to complete for the day, or holding virtual synchronous class, students still faced the issue of varied parental support. As Ceglie and Black (2021) explain "some children had additional support from tech-savvy parents or parents who now had time to work with their child to assist in learning and navigating the new virtual environment" (p. 101) while others did not. Researchers have shown that parental support does help increase student success (Fehrmann et al., 1987; Lam & Ducreux, 2013) and in the time of the Pandemic while students were not afforded the opportunity to go to school and work in a classroom learning from the teacher,

parents began to play an even more important role in education. However, it was seen that although parents may be tech-savvy or just at home while working from home, they had other duties that limited time spent with students helping them with work or to understand a new concept. Parents were now not only working from home, but also taking care of the children in the home. Homes with younger children tend to require more hands-on care from parents and sometimes limited time spent helping with schooling. Further, older siblings were required to tend to younger siblings, limiting their time to attend virtual classes and/or do their assignments. Therefore, the achievement gap that was noted before the Pandemic began to get larger.

2.3. Implications Moving Forward

Now that the world has seen what online teaching and learning in the K-12 arena "looks" like, when suddenly forced to do so, it will be interesting to see home teacher preparation or professional development shifts as a result of this experience. For example, in the 2016 Michigan Virtual Learning Research Institute study mentioned earlier, 60% of the faculty surveyed did not feel it necessary to prepare teachers for a world of online learning (Archambault et al., 2016). Even though online teaching may have been most prevalent in higher education before the pandemic, in what ways might higher education respond now? (Lederman, 2020). The current urgency of the situation may counterbalance what has been a disconnect in teacher preparation for years - whether to focus on planning for the present reality or to prepare for the possible future. It seems that many faculties see online education representing the need of only a small portion of students and not something all students need to be exposed (Archambault et al., 2016, p. 15). Is it even possible that this whole experience has buffeted the teacher's toolkit in a way that both online experiences as well as face-to-face teaching will be more effective moving forward? Improved teaching skills or pedagogy would certainly be a welcomed long-term impact from this ordeal. Taking full advantage of the available technology, using social media and virtual discussions, could possibly create even more engaging experience for students (Dimeo, 2017).

And what about those who were new to teaching, just graduated from traditional teacher preparation programs only to find themselves completely immersed in online teaching? In a Policy Brief by the United States Department of Education found that many pre-service graduates "feel unprepared to use technology effectively in their classroom practice on their first day of in-service teaching" (2016, p. 8), even though this very department has for years provided four guiding principles to lay the foundation of how teacher preparation should address technology. These guiding principles include:

- Focus on the active use of technology to enable learning and teaching through creation, production, and problem-solving.
- Build sustainable, program-wide systems of professional learning for higher education instructors to strengthen and continually refresh their capacity to use technological tools to enable transformative learning and teaching.
- Ensure pre-service teachers' experiences with educational technology are program-deep and program-wide, rather than one-off courses separate from their methods courses.
- Align efforts with research-based standards, frameworks, and credentials recognized across the field. (U.S. Department of Education, 2016, p. 8)

Interestingly, none of these are explicit in their guidance as to how to teach in an online environment. In considering short- and long-ramifications, the plight of the learners themselves cannot be ignored. "Learning loss resulting from school closures has impacts that can extend into adulthood, including reduced earning potential and educational attainment" (Olneck-Brown, 2021, p. 2).

How this nation or even the world in general will be better prepared, educationally, to handle future pandemics or mass closing of schools and transitions to virtual learning, or the degree to which virtual and online learning will remain as a mainstay in the K-12 educational realm are yet to be seen. As the future awaits, however, we may be best served in considering the perceptions of

teachers as these very challenges were addressed, head on. These perspectives may provide a glimpse into successes, failures, and how to be ready in case the unthinkable happens again.

2.4. Research Questions

Regarding the pivot to online teaching due to the pandemic of 2020, the research questions are:

1. Is there a difference among teacher perceptions of preparedness and (a) years of teaching experience, (b) content area, (c) school type, (d) school level?
2. Is there a difference between teacher perceptions of preparedness among levels of support from universities, districts, and schools?
3. What qualitative themes emerge in opinions shared about the pandemic pivot?

3. Method

This study utilized mainly quantitative methods to analyze the information and more fully understand this phenomenon. The survey instrument was used to collect data, integrated both open-ended and closed-ended questions. Because the variables were not manipulated, nor was data collection post hoc, the independent variable was categorical in measurement, the overall design was more casual-comparative in nature.

3.1. Preparing for Online Teaching and Learning Instrument (POTLI)

As a result of the COVID-19 Pandemic, teachers had an increased burden on both their cognitive load and their personal time. For that reason, it was determined that the instrument to be developed should be relatively quick, easy to understand, and utilize a five-point Likert-type scale in order to collect the information that reflected the target construct of the research questions, but did not place additional strains on teachers' resources, both cognitive and time-based. The decision was made to utilize a five-point scale rather than a three- or four-point scale as the data provided would be both more reliable and more discriminating (Ray, 1980).

A total of 22 Likert-style rating questions were developed to measure the target constructs of teacher perceptions towards the pandemic pivot. Participants were asked to provide their opinions towards the pivot in the form of a ration from one to five, with each numeral associated with statements in the continuum of strongly disagree (1), disagree (2), neither agree nor disagree (3), agree (4), and strongly agree (5). None of the items were reverse coded in order to allow for simple item means to provide an accurate representation of opinion scores. Five demographic questions were added to the beginning of the instrument for the purpose of developing answer context and providing disaggregating variables for quantitative analyses. Five more questions in the form of open-ended response items were added to the end of the instrument which provided an opportunity for the participants to share their thoughts outside the confines of the Likert-type scale. Finally, the instrument was titled Preparing for Online Teaching and Learning Instrument (POTLI). Appendix A presents the full instrument questions with all items in the same order they were presented to research participants.

3.2. Reliability and Validity

After codifying the literature, hearing from school and districts leaders that were graduate students, researchers dialogued about the content of the POTLI questions. This was done to effectively ensure the questions indeed measured the constructs intended to be measured, thereby establishing the instrument's content validity. In determining whether the instrument had reliable internal consistency in measuring the target constructs of perceptions of online learning, a series of intraclass correlations were conducted to determine the reliability of the instrument. This is an important measure for determining whether an instrument has a measure of internal consistency and critical in establishing external validity (Croasmun & Ostrom, 2011). Overall, across all items, the scale was found to hold a high level of internal consistency, as determined by a Cronbach's alpha of $\alpha = 0.823$. The overall scale of items had a mean of 65.85, a variance of 170.05, and a standard deviation of 13.04 across the 22 non-demographic items. This indicates that respondents

scored relatively similarly with a few key disagreements. This instrument validity allowed for analysis of variances between the demographic respondent groups with confidence in the outcomes. An overall Crohnbach's alpha was not the only measure of reliability available, however, since the instrument was designed with semi-cyclical response patterns and distinct subscales in mind.

The subscales that were examined included Transitioning to Virtual or Online Teaching and Learning (10 items), Implementation of Online Teaching and Learning (6 items), Stakeholder Reactions and Post-Closure (5 items). Each of the subscales held an alpha higher than 0.70, indicating a good level of internal consistency, instrument reliability, among items withing the underlying constructs (DeVellis, 2003; Kline, 2015). This indicates that the instrument has an acceptable level of reliability for further usage in measuring teachers' perceptions of their preparedness for online teaching and learning. Additionally, the validity of the subscales allows for portions of the instrument to be adapted for smaller, more targeted analyses of teacher perceptions towards online learning in the future. Information within Table 1 illustrates the reliability for each of the subscales.

Table 1
Reliability Measures for the Preparing for Online Teaching and Learning Instrument (POTLI)

Scale	*n*	*M*	*SD*	s^2	α
Overall	108	65.85	13.040	170.05	.877
Transitioning to Virtual or Online Teaching	115	31.95	7.725	59.681	.829
Implementation of Online Teaching	116	17.61	4.920	24.205	.804
Stakeholder Reactions and Post-Closure	114	16.15	3.614	13.058	.731

3.3. Sampling

Once the POTLI was fully developed and IRB was established, utilizing a convenient initial sample, a teaching population was identified consisting of teachers across the state of North Carolina, mainly due to the proximity of some of the researchers. Several list-serves of teachers from the state were identified and obtained. An email was sent to potential participants from Queens University in Charlotte. Potential participants were informed of a request for their experiences transitioning to online instructing during the COVID-19 Pandemic. The instrument was built into an online surveying platform and a link to the survey, along with a statement regarding confidentiality and acceptance of participation in the study, was sent to more than 1,200 teachers across the state of North Carolina via the list-serves.

The research candidates were randomly selected via stratified random sampling within the subgroups of venue, geographic location, grade level, and content area. After some responses were collected, a follow-up e-mail was sent to the identified potential participants in an effort to increase response rates. At the end of the survey period, a total of 140 teachers had participated in this study, yielding a response rate of 11.7%. The researchers determined at the time that, while the response rate seemed lower than average rates (Dillman et al., 2008), due to the nature of the global pandemic and the cognitive burden of completing a reflective perceptual survey meant that the response rate was acceptable for the study and appropriately robust enough to draw conclusions in most areas. Of note is the fact that the number of respondents from charter schools was small enough to reduce the validity of analyses utilizing the *school venue* demographic variable.

3.4. Variables

For the majority of items, the teacher response on the Likert-style questions was the dependent variable. The total simple mean of all responses for each item provided a mean *opinion score*. Means greater than three indicated an overall positive perception and means lower than three indicated an overall negative perception, with the distance from three measuring the magnitude of the perception. The demographic variables were utilized to create factor groups to analyze the

variance between response groups. The factor groups used were *school level* (elementary, middle, or high school), *years of experience* (new to teacher, 1-5 years, 6-10 years, 11-15 years, 16-20 years, or 21 and over years of experience), *content area* (English/language arts, mathematics, science, social studies/history, multidisciplinary), *school venue* (public, private, or charter), and *program graduate* (yes/no to whether the students attended Queens University of Charlotte). Responses to these items were operationalized as independent, categorical variables for the purpose of conducted analyses of variance between the groups.

For the open-ended items, each response was reviewed by two of the authors and coded into an emergent theme and applied a *sentiment score*, either positive, negative, or neutral, to capture the feeling of the response separate from the content of the response. The emergent themes passed through a second round of review in which the themes were aggregated into more prevalent groups to determine the most common themes from the results, which allowed for analysis of the prevailing themes. The sentiment variable allowed for a qualitative examination of the overall attitude of the open-ended responses.

3.5. Data Analysis

After the instrument was developed and loaded to an online survey platform, teacher emails were collected via list-serves and potential candidates were contacted digitally to request participation. The data was downloaded and sorted in a row-context, with each row representing a participants' response, and each column representing a question from the instrument. Responses were transcoded from literary constructs to numerical representations (i.e., "strongly disagree" became "1") for all items except open ended responses, and emergent response themes and sentiment score items were added within the row context. Item means, medians, modes, and response frequencies were calculated for each of the questions, as has been recommended within the literature for analyzing Likert-type questions (Boone & Boone, 2012). The authors reviewed the emergent response themes and sentiment scores, discussed discrepancies, and agreed upon the most prevalent themes. Representative quotes from within the response set were identified to illustrate the themes when pertinent to the results.

With all data organized within a row context, the coded response set was loaded into the Statistical Package for Social Sciences 27 and analyzed for their descriptive statistics, which are reported in the results section. A series of inferential analyses of variance (ANOVA) were applied with the responses disaggregated based on the demographic characteristics of the respondents as reports from the first five items of each of the survey results, a practice that has been found to have relatively low probability of a Type-1 error when using Likert-type items (de Winter & Dodou, 2010). The analyses examined the differences in opinions of groups of teachers based on their school level, content area, years of experience and school venue. Tests for normality, homogeneity of variances, and statistical outliers were conducted with each analysis of variance and are reported with analyses when violations occurred. However, while the majority of the response items tended to be non-normal, the ANOVA is generally robust enough to deviations from normality (Lix et al., 1996). Still, in these cases, the violation was reported. In the rare case of statistical outlier, the decision was made if the responses qualified as genuinely unusual variables and the responses were left in the dataset without alteration.

4. Findings

The response group to the survey included 140 teachers total. By school level, 63 of the respondents worked in elementary schools, 35 worked in middle schools, 39 in high schools, and three teachers marked themselves as other. By experience, 11 respondents identified as new teachers, 22 as having 1-5 years of teaching experience, 29 respondents identified as 6-10 years, 26 with 11-19 years, 18 with 16-20 years, and 33 with 21+ years of teaching experience. By school venue, 13 indicated that they worked in private schools, five in charter schools, and 121 in public schools. Not all participants answered each question. Likert-type questions are presented with their mean response scores and standard deviations. A question with a high SD indicated a large

difference in respondent perceptions, while a low SD indicated general agreement among respondents. A mean of one, indicated *strong disagreement* with the statement, while a mean of five indicated *strong agreement*. Central tendencies of results are listed in Table 2.

Table 2
Responses Means for Likert-type Items on the Preparing for Online Teaching and Learning Instrument (n = 119)

Item	*n*	Mean	Mode	*SD*
Q6. I was personally knowledgeable about online teaching prior to school closings.	119	2.97	3	1.295
Q7. The majority of my school's teachers were knowledgeable about online teaching prior to school closings.	119	2.23	2	1.029
Q8. I personally had an instructional skill set applicable to online teaching prior to school closings.	119	3.18	4	1.205
Q9. The majority of my school's teachers had an instructional skill set applicable to online teaching prior to school closings.	119	2.31	2	0.954
Q10. I personally attended or read the preparatory materials, modules or training that were implemented to prepare for online teaching.	119	3.54	4	1.148
Q11. The majority of my school's teachers attended or read the preparatory materials, modules or trainings that were implemented to prepare for online teaching.	117	3.25	3	1.113
Q12. I personally felt confident in my ability to transition to online teaching and learning.	119	3.54	4	1.095
Q13. My university/higher education experience had adequately prepared me for a seamless transition to online teaching.	119	2.65	1	1.350
Q14. My district's professional development and teacher support had adequately prepared me for a seamless transition to online teaching.	119	2.76	2	1.212
Q15. My school's professional development and teacher support had adequately prepared me for a seamless transition to online teaching.	118	2.78	2	1.241
Q16. The majority of my school's teachers exhibited confidence in their ability to transition to online teaching and learning.	118	2.70	2	1.065
Q17. When executed correctly, students should receive the same level of instruction and learning in an online environment as they do in a face-to-face environment.	118	2.81	2	1.289
Q18. I am successfully executing the technical requirements of online teaching and learning.	118	3.76	4	0.864
Q19. I am teaching effective lessons with online teaching and learning.	117	3.37	4	1.014
Q20. The majority of my students are advancing their learning and growing in their understanding of course content as a result of online teaching and learning.	118	2.64	2	1.051
Q21. The integrity of the delivery of my course curriculum is intact through the use of online teaching and learning.	117	3.10	3	1.185
Q22. I have personally been observed by a school leader while delivering an online lesson during this school closure period.	118	1.91	1	1.450
Q23. The majority of students in my class(es) are taking the transition to online teaching and learning seriously.	116	2.59	3	1.187
Q24. The majority of teachers in my school are taking the transition to online teaching and learning seriously.	115	4.04	4	0.902
Q25. The parents, guardians, and family of the students in my class(es) are taking the transition to online teaching and learning seriously.	115	2.96	3	1.063
Q26. As a result of this transition to online teaching and learning, the students of my class (es) will be better prepared and more proficient with the knowledge and skills necessary to be career and college ready.	115	2.47	2	1.111
Q27. As a result of this transition to online teaching and learning, I will return to face-to-face teaching with a stronger set of instructional skills and knowledge.	116	4.09	4	0.913

The items that participants most often *agreed* with were "As a result of this transition to online teaching and learning, I will return to face-to-face teaching with a stronger set of instructional skills and knowledge," "The majority of teachers in my school are taking the transition to online teaching and learning seriously," and "I am successfully executing the technical requirements of online teaching and learning." The items that participants most often *disagreed* with were, "I have personally been observed by a school leader while delivering an online lesson during this school closure period," "The majority of my school's teachers were knowledgeable about online teaching prior to school closings," and "The majority of my school's teachers had an instructional skill set applicable to online teaching prior to school closings."

The item with the greatest deviation in responses was "I have personally been observed by a school leader while delivering an online lesson during this school closure period," and "My university/higher education experience had adequately prepared me for a seamless transition to online teaching." On eight of the 22 Likert-type items, the mode differed from the median response. While it is useful to examine the overall response set, this research was primarily concerned with whether specific demographic groups of teachers had distinctly different opinion from other demographic groups in their perception of the pandemic pivot.

4.1. Teacher Preparedness: Grade Level Experience, Content Area, School Type and Level

This section seeks to answer the first research question. *(RQ1: Is there a difference among teacher perceptions of preparedness and grade level experience, content area, school type, and school level?)*

4.1.1. Differences between years of teaching experience

When it came to the pandemic pivot, there were not many significant differences in opinion between groups when clustered by years of teaching experience. Table 3 presents each question as an ANOVA, analyzed for differences between the experience groups. Only two of the 22 analyzed had significant outcomes.

Table 3
One-Way ANOVAs for POLTI Items by Respondent Years of Teaching Experience

	SS Between	*df* Between	SS Within	*df* Within	Mean Square Between	Mean Square Within	*F*	Sig.
Q6	10.303	5	187.563	113	2.061	1.660	1.241	.295
Q7	2.852	5	122.022	113	0.570	1.080	0.528	.755
Q8	20.181	5	151.113	113	4.036	1.337	3.018	.014*
Q9	3.825	5	103.671	113	0.765	0.917	0.834	.528
Q10	1.915	5	153.665	113	0.383	1.360	0.282	.922
Q11	6.687	5	136.945	111	1.373	1.234	1.113	.358
Q12	9.614	5	131.966	113	1.923	1.168	1.646	.153
Q13	31.016	5	184.161	113	6.203	1.630	3.806	.003**
Q14	5.755	5	167.657	113	1.151	1.484	0.776	.569
Q15	5.136	5	175.136	112	1.027	1.564	0.657	.657
Q16	6.232	5	126.386	112	1.246	1.128	1.105	.362
Q17	5.394	5	189.123	112	1.079	1.689	0.639	.671
Q18	2.461	5	84.895	112	0.492	0.758	0.649	.663
Q19	2.362	5	116.834	111	0.472	1.053	0.449	.813
Q20	4.432	5	127.898	112	0.886	1.115	0.795	.556
Q21	5.082	5	157.688	111	1.016	1.421	0.715	.613
Q22	6.074	5	239.901	112	1.215	2.142	0.567	.725
Q23	4.827	5	157.130	110	0.965	1.428	0.676	.643
Q24	3.229	5	89.553	109	0.646	0.822	0.786	.562
Q25	1.991	5	126.791	109	0.398	1.163	0.342	.886
Q26	6.588	5	134.055	109	1.318	1.230	1.071	.380
Q27	4.133	5	91.824	110	0.827	0.835	0.990	.427

Note. *$p < .05$, **$p < .01$

The first statistically significant difference (Item Q8) examined whether respondents felt that they had an instructional skill set that was applicable to online teaching prior to the Spring 2020 school closing. Although Shapiro-Wilk tests showed that normality was not met in three of the groups, the ANOVA was still utilized due to the robustness of the measure. The groups with the highest means responses were those with one to five years of experience (M = 3.59), likely younger teachers that might possess computer fluency and considered digital natives. The group with the lowest opinion mean was those with greater than 21 years of experience (M = 2.50), likely older teachers that were less proficient digitally. The difference between all groups was statistically significant, $F(5, 113) = 3.018$, $p = .014$, $\eta^2 = .118$, and a post-hoc analyses revealed that the most significant different was between the most veteran teachers and teachers with one to ten years of experience (MD = -1.09, $p = .029$). Statistically, this indicates that more experienced teachers were more likely to perceive themselves as *less prepared for online teaching*. This statistically significant difference was corroborated with a Pearson correlation, $r = -.264$, $p = .004$, where greater experience was weakly correlated with lower opinion towards online teaching.

In a similar vein, the other statistically significant difference in opinions between experience groups was on (Item Q13), the statement that university/higher education has adequately prepared the respondent for a seamless transition to online teaching. There was a statistically significant difference between years of teacher experience in perception of their university's ability to prepare teachers for online learning, $F(5, 112) = 3.791$, $p = .003$, $\eta^2 = .145$. The largest difference in perception was between teachers who had worked for 21 or more years and teachers who had worked for 1-5 years (MD = 1.6, p = .001). As with the previous analysis, a Pearson correlation was calculated to substantiate, and similarly determined a significant association between experience and opinion of university preparedness, $r = -.302$, $p < .001$. In both cases, more experienced teachers (21 or more years) were likely to agree that universities and higher learning were unlikely to have prepared them for the realities of online teaching in 2020. This has face validity since it is true that over the decades, preparing teachers for online teaching and learning has improved.

4.1.2. Content area

As with the analyses of groups based on years of experience, an array of ANOVAs were conducted on each item to determine if there were statistically significant differences in opinion responses based on the respondents self-identified content area taught. Twenty-two ANOVAs were conducted for the Likert-type items and the differences were statistically significant on six of the analyses, as shown in Table 4.

Across all six significant differences, the group that was *most likely* to have different opinions from the sample, were social studies/history teachers. On the item "*I was personally knowledgeable about online teaching prior to school closings*" $F(4,114) = 2.672$, $p = .036$, $\eta^2 = .027$ social studies teachers (n = 9, M = 4.0) had a higher mean response than English language arts teachers (n = 31, M = 2.97), math teachers (n = 24, M = 3.04), science teachers (n = 20, M = 3.20) and multidisciplinary teachers (n = 35, M = 2.51). Social studies teachers also reported that they viewed themselves as *more likely* to have attended or read the preparatory materials or modules and to have attended trainings to prepare for online teaching, $F(2, 114) = 2.672$, $p = .036$, $\eta^2 = .086$. The largest gap was between social studies teachers and multidisciplinary teachers, MD = 1.302, $p = .019$. ELA, math, and science teachers all responded similarly to the item, with means slightly higher than neutral.

Interestingly, while social studies teachers also scored statistically significantly different from other content areas on the item "*When executed correctly, students should receive the same level of instruction and learning in an online environment as they do in a face-to-face environment,*" their opinions of student learning in online environments was *lower* than that of all of the other content areas

Table 4
One-Way ANOVAs for POLTI Items by Respondent Content Area Taught

	SS Between	*df* Between	SS Within	*df* Within	Mean Square Between	Mean Square Within	*F*	Sig.
Q6	17.997	4	179.869	114	4.499	1.578	2.852	.027*
Q7	3.373	4	121.501	114	0.843	1.066	0.791	.533
Q8	8.504	4	162.790	114	2.121	1.428	1.489	.210
Q9	5.879	4	101.616	114	1.470	0.891	1.649	.167
Q10	13.334	4	142.246	114	3.333	1.248	2.672	.036*
Q11	11.031	4	132.781	112	2.758	1.186	2.326	.061
Q12	5.051	4	136.529	114	1.263	1.198	1.054	.382
Q13	8.052	4	207.125	114	2.013	1.817	1.108	.356
Q14	11.135	4	162.277	114	2.784	1.423	1.956	.106
Q15	14.124	4	166.147	113	3.531	1.470	2.402	.054
Q16	4.030	4	128.588	113	1.008	1.138	0.885	.475
Q17	22.212	4	172.305	113	5.553	1.525	3.642	.008**
Q18	1.168	4	86.188	113	0.292	0.763	0.383	.821
Q19	7.525	4	111.671	112	1.881	0.997	1.887	.118
Q20	10.867	4	118.463	113	2.717	1.048	2.591	.040*
Q21	17.251	4	145.519	112	4.313	1.299	3.319	.013*
Q22	5.769	4	240.205	113	1.442	2.126	0.679	.608
Q23	7.917	4	154.040	111	1.979	1.388	1.426	.230
Q24	2.772	4	90.011	110	0.693	0.818	0.847	.499
Q25	4.092	4	124.691	110	1.026	1.134	0.902	.465
Q26	8.471	4	132.173	110	2.118	1.202	1.762	.142
Q27	10.934	4	85.022	111	2.734	0.766	3.569	.009**

Note. *$p < .05$, **$p < .01$

$F(4, 113) = 3.642$, $p = .008$, $\eta^2 = .114$. The difference was significant between social studies teachers in comparison to both math ($MD = -1.5$, $p = .029$) and science ($MD = -1.6$, $p = .020$) teachers. Social studies teachers were much *less likely* to believe that their students could learn from an online environment as well as they could in a face-to-face one. This difference was similarly present in perceptions of students' growth and understanding as a result of online teaching and learning. Social studies teachers, as a group, held *lower* perceptions of student growth ($M = 2.00$) in online learning than all other content area groups, $F(4, 113) = 2.591$, $p = .040$, $\eta^2 = .084$, although all content areas held overall negative perceptions towards student learning through online teaching and there were no statistically significant differences between any individual groups in a post-hoc analysis.

Another area that social studies teachers perceived themselves has having worse pandemic pivots than other content areas was in whether their curriculum remained intact through the use of online teaching and learning. Most content areas were distinctly neutral in their response to the item, with all group means being slightly above 3.0 and science self-reporting the highest perception of intactness of curriculum ($M = 3.55$), but social studies teachers held a particularly negative view ($M = 1.88$) of how their curriculum was affected by the move to teaching online. Particularly, social studies teachers perceived online learning as having *less* integrity particularly when compared to math ($MD = -1.417$, $p = .024$) and science ($MD = -1.675$, $p = .006$) teachers.

The final significant content area analysis found that social studies teachers were less likely to agree with the statements "*As a result of this transition to online teaching and learning, I will return to face-to-face teaching with a stronger set of instructional skills and knowledge,*" $F(4, 111) = 3.569$, $p = .009$, $\eta^2 = .114$. Social studies teachers actually scored significantly different from all other content areas, ELA ($MD = -1.097$, $p = .027$), math ($MD = -1.083$, $p = .037$), science ($MD = -1.450$, $p = .002$), and multidisciplinary ($MD = -1.118$, $p = .022$).

The social studies teachers in the sample set had considerably different opinions towards pivoting to online teaching in comparison to other subject area teachers. They had higher

perceptions of their own abilities, believing that they were more knowledgeable and better prepared for online teaching than teachers of other contents, yet they were also more pessimistic about the efficacy of online teaching and the ability of their students to learn.

4.1.3. School venue

The next set of analyses examined the differences between the groups based on the school venue of the respondent, whether public school (n = 103), charter (n = 5), or private school (n = 10). It is worth noting that these differences hold relatively low power due to small sample size of respondents in the charter pool. For this reason, the differences here focus on post-hoc analyses where private school respondents held significantly different perceptions from public school respondents. The summary of these analyses can be seen in Table 5.

Table 5
One-Way ANOVAs for POLTI Items by Respondent School Venue

	SS Between	*df* Between	SS Within	*df* Within	Mean Square Between	Mean Square Within	*F*	Sig.
Q6	2.137	2	195.729	116	1.068	1.687	0.633	.533
Q7	0.284	2	124.560	116	0.142	1.074	0.132	.786
Q8	0.010	2	171.285	116	0.005	1.477	0.003	.997
Q9	4.357	2	103.138	116	2.179	0.889	2.450	.091
Q10	4.834	2	150.746	116	2.417	1.300	1.860	.160
Q11	6.351	2	137.461	114	3.179	1.206	2.634	.076
Q12	1.489	2	140.090	116	0.745	1.208	0.617	.542
Q13	8.876	2	206.300	116	4.438	1.778	2.496	.087
Q14	3.552	2	169.860	116	1.776	1.464	1.213	.301
Q15	7.836	2	172.435	115	3.918	1.499	2.613	.078
Q16	5.310	2	127.309	115	2.655	1.107	2.398	.095
Q17	0.363	2	194.154	115	0.181	1.688	0.107	.898
Q18	2.494	2	84.862	115	1.247	0.738	1.690	.189
Q19	4.436	2	114.761	114	2.218	1.007	2.203	.115
Q20	20.402	2	108.928	115	10.201	0.947	10.770	.001**
Q21	1.363	2	161.406	114	0.682	1.416	0.481	.619
Q22	5.260	2	240.715	115	2.630	2.093	1.256	.289
Q23	18.669	2	143.288	113	9.334	1.268	7.361	.001**
Q24	3.393	2	89.390	112	1.696	0.798	2.125	.124
Q25	26.323	2	102.460	112	13.161	0.915	14.387	.001**
Q26	4.103	2	136.540	112	2.052	1.219	1.683	.190
Q27	4.385	2	91.572	113	2.192	0.810	2.705	.071

Note. *p < .05, **p < .01

Respondents who worked at private schools held significantly different opinions from their public-school counterparts on three items. The first was the item, "*The majority of my students are advancing their learning and growing in their understanding of course content as a result of online teaching and learning,*" $F(2, 115) = 10.772$, $p < .001$, $\eta^2 = .158$. A post-hoc analysis showed that the mean difference between public and private schools' teachers ($MD = -1.485$, $p < .001$) was also statistically significant. Private school teachers agreed that their students were advancing and learning during online instruction (M = 4.0), while public school teachers mostly disagreed (M = 2.51). This difference may be due to the perception of how seriously students and their families take online instruction. On the item, "*Majority of students in my class(es) are taking the transition to online teaching and learning seriously,*" private school teachers were much more likely to agree with the statement (M = 3.90) when compared to public school teachers (M = 2.48) and charter schools' teachers (M = 2.40). This difference was statistically significant, $F(2, 113) = 7.361$, $p = .001$, $\eta^2 = .115$.

This perception spread to parents and guardians as well. When asked about whether student families were taking online learning seriously, private school respondents had very high mean responses (M = 4.50), while public school teachers were mostly neutral (M = 2.82), $F(2, 112) = 14.387$, $p = .000$, $\eta^2 = .204$. This perception of receiving more support in learning from both students and their families may contribute to the overall higher perceptions of online learning experienced by private school teachers.

4.1.4. School level

The final set of analyses of variance on the Likert-type items was conducted across groups of differing school levels: elementary, middle school, and high school. This grouping garnered the most significant differences in response patterns, with five of the 22 items yielding statistically significant difference in perceptions. Since only three participants identified themselves as "Other", they were excluded from the analysis due to exaggeration of effects due to the extremely small group size. Table 6 presents a summary of the analyses for all items based on school level.

Table 6
One-Way ANOVAs for POLTI Items by Respondent School Level

	SS Between	*df* Between	SS Within	*df* Within	Mean Square Between	Mean Square Within	*F*	Sig.
Q6	15.547	2	178.419	115	7.774	1.551	5.010	.008**
Q7	12.439	2	110.916	115	6.220	0.964	6.449	.002**
Q8	8.283	2	159.658	115	4.141	1.388	2.983	.055
Q9	8.267	2	97.496	115	4.133	0.848	4.875	.009**
Q10	7.292	2	146.132	115	3.646	1.271	2.869	.061
Q11	8.656	2	133.585	113	4.328	1.182	3.661	.029*
Q12	5.558	2	135.730	115	2.779	1.180	2.355	.099
Q13	2.702	2	212.349	115	1.351	1.847	0.732	.483
Q14	4.435	2	165.836	115	2.217	1.442	1.538	.219
Q15	2.595	2	177.627	114	1.297	1.558	0.833	.438
Q16	3.181	2	126.511	114	1.433	1.110	1.433	.243
Q17	4.263	2	185.395	114	1.311	1.626	1.311	.274
Q18	1.444	2	84.368	114	0.788	0.740	0.976	.380
Q19	6.050	2	110.458	113	3.025	0.978	3.095	.049*
Q20	3.381	2	120.311	114	1.691	1.055	1.602	.206
Q21	2.794	2	156.343	113	1.397	1.384	1.010	.368
Q22	3.657	2	232.667	114	1.829	2.041	0.896	.411
Q23	3.979	2	152.143	112	1.989	1.358	1.464	.236
Q24	1.709	2	90.151	111	0.855	0.812	1.052	.353
Q25	4.261	2	120.309	111	2.130	1.084	1.966	.145
Q26	6.630	2	127.554	111	3.315	1.149	2.885	.060
Q27	1.189	2	93.942	112	0.594	0.839	0.709	.495

Note. *$p < .05$, **$p < .01$

As a block, the group that reported the highest perceptions of preparedness for online teaching was middle school teachers, with elementary teachers consistently reporting the most trepidation. On the item, "*I was personally knowledgeable about online teaching prior to school closings,*" there was a significant difference in perception of knowledge of online teaching pre-pandemic when considering teacher school levels, $F(2, 115) = 5.010$, $p = .008$, $\eta^2 = .080$. High school teachers perceived themselves as being more prepared for online teaching pre-pandemic than other school levels. Elementary teachers, as a group, felt the *least* prepared, especially when compared to high school teachers (MD = -0.554, $p = .007$).

In comparison, when asked about overall school preparedness (as opposed to individual preparedness), middle school teachers perceived their schools as being more prepared for online teaching than other school levels, $F(2, 115) = 6.449$, $p = .002$, $\eta^2 = .101$. Elementary teachers, as a

group, felt that their schools were less prepared than other levels, especially when compared to middle school teachers ($MD = -0.779$, $p = .002$). The differences between middle and high school were not significant.

The differences were the same for the items, "*The majority of my schools' teachers had an instructional skill set applicable to online teaching prior to school closings,*" $F(2, 115) = 4.875$, $p = .009$, $\eta^2 = .078$, "*The majority of my school's teachers attended or read the preparatory materials, modules, or trainings that were implemented to prepare for online teaching,*" $F(2, 113) = 3.661$, $p = .029$, $\eta^2 = .061$, and "*I am teaching effective lessons with online teaching and learning,*" $F(2, 113) = 3.095$, $p = .049$, $\eta^2 = .052$. In all three cases, middle school teachers had higher perceptions of preparedness for online teaching, especially in comparison to elementary teachers, who perceived themselves as not having transferable skill sets ($M = 2.04$), and as being unprepared as a school overall ($M = 3.0$).

4.2. Teacher Preparedness: Levels of Support from Universities, Districts, Schools

This section seeks to answer the second research question. *(RQ2: Is there a difference between teacher perceptions of preparedness among levels of support from universities, districts, and schools?)*

Teacher perception of preparedness was operationalized as the response on the items that included the word "*personally*" in the perceptual statement, asking whether teachers personally felt that they were knowledgeable about online teaching, had an instructional skill set applicable to teaching online, had read or attended preparatory trainings, and felt confident in their ability to transition to online teaching and learning. Analysis groups were developed around whether respondents agreed or disagreed with items Q13 (university), Q14 (district), and Q15 (school), where respondents reported out their perceived levels of support. Table 7 features a summary of the four items that represent personal perception of preparedness for online teaching factored by perception of support from various entities.

Table 7
One-Way ANOVAs for POLTI Preparedness Items by Respondent Perceptions of Support

	SS Between	*df* Between	SS Within	*df* Within	Mean Square Between	Mean Square Within	*F*	Sig.
University Support								
Q6	38.607	4	98.984	83	9.652	1.193	8.093	.001**
Q8	47.974	4	71.481	83	11.993	0.861	13.926	.001**
Q10	4.604	4	102.475	83	1.151	1.235	0.932	.449
Q12	22.003	4	58.046	83	5.508	0.699	7.876	.001**
District Support								
Q6	0.997	4	136.594	83	0.249	1.646	0.151	.962
Q8	3.456	4	115.998	83	0.864	1.398	0.618	.651
Q10	4.835	4	102.244	83	1.209	1.232	0.981	.422
Q12	8.317	4	71.762	83	2.079	0.865	2.405	.056
School Support								
Q6	5.214	4	132.377	83	1.303	1.595	0.817	.518
Q8	4.050	4	115.404	83	1.013	1.390	0.728	.575
Q10	2.487	4	104.592	83	0.622	1.260	0.493	.741
Q12	9.100	4	70.979	83	2.275	0.855	2.660	.038*

Note. *$p < .05$, **$p < .01$

The greatest difference in opinions existed when responses were analyzed by perception of how well a university had prepared the respondent. Multiple participants noted that they had attended university before the internet existed and that technology was not a feature of their teacher preparation program. Teachers who *strongly agreed* or *agreed* that their university had adequately prepared them for teaching online were more likely to feel personally knowledgeable about online teaching, $F(4, 83) = 8.093$, $p < .001$, $\eta^2 = .281$, especially when compared to those who *strongly disagreed* (Strongly Agree $MD = 1.918$, $p < .001$; Agree $MD = 1.460$, $p < .001$), were likely to perceive

their instructional skill set as applicable to online teaching $F(4, 83) = 13.926$, $p < .001$, $\eta^2 = .402$, also significant when compared against those who *strongly disagreed* (Strongly Agree $MD = 2.213$, $p < .001$; Agree $MD = 1.199$, $p = .001$), and were more likely to feel confident in their ability to transition to online teaching and learning, $F(4, 83) = 7.876$, $p < .001$, $\eta^2 = .275$. Whether a teacher attended training or read preparatory materials, however, was not significantly different across perception groups of how well a university prepared one for online teaching, $F(4, 83) = 0.932$, $p = .449$, $\eta^2 = .043$.

There were very few differences in opinion when grouped by perceived level of support from school districts or school sites. The only significant difference was in the level of personal confidence of the pivot: those who reported that their school had adequately prepared them for online teaching were *more likely* to perceive that they were more prepared for online teaching than those who *disagreed* with the statement, $F(4, 83) = 2.660$, $p = .038$, $\eta^2 = .114$.

4.3. Qualitative Themes: Opinions about Pandemic Pivot

This section seeks to answer the third research question. *(RQ3: What qualitative themes emerge in opinions shared about the pandemic pivot?)*

To answer the final research question, each open-ended response for items Q28-Q32 was reviewed by one researcher and thematically coded with emergent themes. A second researcher separately coded the emergent themes and compared the documents, to increase qualitative validity through data integrity independent verification. Prevalent themes were then organized, and the items were assessed by the initial researcher and rethemed. For simplicity, all emergent themes have been collected in Table 8, although not all themes emerged similarly on each question as different constructs were being measured.

The most common theme reported as a challenge for teachers during the pivot was keeping students engaged or motivated, followed closely by technology related challenges. The most common theme for sources of pride during the transition was overcoming technological barriers, followed by communication success with student. It is of note that the technological issues seemed to be a two-sided coin; nearly as many respondents struggle with technology as those who felt that they succeeded with it.

In relation to perceptions of what could be done better, at the university level, the most common theme was for more PD or training to be provided by universities or higher education authorities. However, at both the level of district support and school support, participants seemed very willing to forgive. Sixty-four responses across these two items featured responses that mentioned no change being needed from leadership teams, commonly featuring language such as, “My school dud the best they could with the information provided by the state,” “My school has been phenomenal in helping teachers prepare,” and “Nothing, we are rocking.”

5. Summary

The overall findings of the analyses indicated that more experienced teachers appeared to identify themselves as *less prepared* for online teaching. Among the sampled teachers from different subject areas, social studies teachers responded with significantly different opinions towards pivoting to online teaching. While at the same time being more doubtful in the ability of their students to learn and doubting the effectiveness of online teaching, they dichotomously had higher perceptions of their own abilities. Social studies teachers perceived themselves as being more *knowledgeable* and *better prepared* for online instructions than teachers of other disciplines.

More private school teachers responded perceiving their students as *advancing* and *learning* during online instruction. Among the different levels, elementary teachers perceived their schools as *less prepared* for online teaching, partially due to inability to transfer their skill sets to online environment. Middle school teachers had higher overall perceptions of preparedness to *successfully transition* to remote teaching.

Table 8
Emergent Qualitative Themes by Open-Ended Response Item

	The most significant instructional challenge faced during this time of school closures:	The most significant source of pride during this transition:	What could have been done differently/ more effectively from higher education:	What could have been done differently/ more effectively from my school district:	What could have been done differently/ more effectively from my individual school:
Absence of physical presence	5 (5.7%)	-	-	-	-
Better scheduling/guidelines	-	-	-	-	6 (7.1%)
Communication	5 (5.7%)	23 (26.7%)	6 (7.5%)	8 (9.4%)	14 (16.7%)
Finding/developing appropriate online materials	5 (5.7%)	14 (16.3%)	-	-	-
Flexibility	6 (6.8%)	-	-	3 (3.5%)	3 (3.6%)
Lack of accountability	8 (9.1%)	-	-	-	-
More PD/training	-	-	38 (47.5%)	21 (24.7%)	16 (19.0%)
No Change Needed/Not Applicable	-	-	28 (35%)	28 (32.9%)	36 (42.9%)
Parent involvement	8 (9.1%)	6 (7.0%)	-	-	-
Proactive/Consistency	-	-	8 (10.0%)	25 (29.4%)	9 (10.7%)
Student engagement/motivation	27 (30.7%)	14 (16.3%)	-	-	-
Technology	24 (27.3%)	29 (33.7%)	-	-	-

In relation to perceptions of what could be done better, at the university level, the most common theme was for more PD or training to be provided by universities or higher education authorities. However, at both the level of district support and school support, participants seemed very willing to forgive. Sixty-four responses across these two items featured responses that mentioned no change being needed from leadership teams, commonly featuring language such as, "My school dud the best they could with the information provided by the state," "My school has been phenomenal in helping teachers prepare," and "Nothing, we are rocking."

Finally, several salient qualitative themes emerged in opinions about the pandemic pivot. Among those included keeping students engaged and motivated, technology challenges, overcoming technological barriers, and communication success with student.

6. Discussion and Implications

The current study presents a number of implications stemming from how K-12 teachers perceived what was happening and how well they were prepared to pivot to online instruction. Before the COVID-19 pandemic, only a minority of the K-12 teachers had taught completely online, and most teachers did not know how to teach online (Danişman & Güler, 2022; Koenig, 2020). According to Eroh (2020), those teachers who had already taught in an online environment were naturally in a better position for a successful transitioning to remote schooling. From these mixed results, it can be seen that some schools and teachers needed to be better prepared to teach online, and according to teacher perceptions, some perceived that students were also unprepared. This raises many implications for school leaders and stakeholders alike.

There are short and long term positive and negative effects the pandemic had and continues to have on teaching and learning, as well as teacher preparation programs, curricula, methods, online platforms, pedagogical strategies, managing student behavior, and more. Offering a coursework and practica in teaching online or through virtual modalities should take a greater place in teacher preparation programs than it currently has, where the majority of skills taught to new teachers relate to teaching face-to-face (Kennedy & Archambault, 2012; Kennedy et al., 2013).

Besides effective communication with students and parents, university programs should renew their policies and practices to address how teachers can keep students engaged and motivated in the virtual environment during prolonged campus closures. Educational leaders need to consider a variety of factors such as the content area of teachers, years of experience, general familiarity with technology, and transferability of skills. Schools should have effective handbook policies and curricular plans established for delivering effective instructions during extended school closures. Currently, teachers are still faced with identifying and adapting their curricula so they may maintain fidelity and relevance when using mediums of partial or full online teaching and learning. Some specific content areas may perceive, more or less, that they lose the integrity when teaching online, this needs to be addressed as well through teacher professional development.

There are several limitations to this study. First, responses were very limited - only one out of every three entered a response within the qualitative section of the survey, two-thirds did not provide any response. There are limitations to the survey instrument itself, which only measured perceptions during the pandemic. As time passes and the pandemic (the construct) moves further in the past, measuring perceptions today about what it was like during the height of the pandemic will invariably change. Moreover, regarding external validity, most of the results of this current study should not be generalized beyond North Carolina, without great caution.

Though technology had already been integrated into K-12 education at various levels to an extent, the pandemic and sudden shift online has clearly illustrated that there may be times when other alternatives are unavailable, and teaching and learning must become fully remote. This study provided a glimpse of teacher perceptions about how well educators were, or were not, prepared to implement such a sudden shift moving from in-person instruction to fully online for a prolonged period of time.

Using the current study's results and findings, future studies should examine how early grade teachers can more successfully teach using online modalities, and learn which online tools and resources are available. Also, future studies should investigate what effect parental support has on student success and if students are learning as completely, in an online environment, as they would in a face to face one. Perhaps, parents could assist in alleviating some of the learning loss resulting from prolonged school closures (Olneck-Brown, 2021). Future research should assess how teacher preparation programs have adapted based on the new changes brought about by the pandemic and lockdown quarantines. This focus may not be only on planning for the present-day reality, but on the possible future where other pandemics that may arise. Among the most prevalent qualitative themes emerged from the opinions shared by these sampled teachers about their experiences pivoting to online instructions were challenges with keeping students engaged and motivated in the new environment and technological barriers. Finally, future studies should also research ways of improving university programs to provide more training and professional development opportunities for both, current students and alumni, so they are also more prepared for sudden pivoting, should it ever be needed again.

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Appendix A

Items on the Preparing for Online Teaching and Learning Instrument (POTLI)

Q1. In what school setting do you serve as a classroom teacher?
Q2. How many years of experience do you have as a teacher?
Q3. What content area is your teaching most predominantly related to?
Q4. In what type of school venue do you teach?
Q5. Did you graduate from or are you currently attending a Queens University of Charlotte Teacher Education Program?
Q6. I was personally knowledgeable about online teaching prior to school closings.
Q7. The majority of my school's teachers were knowledgeable about online teaching prior to school closings.
Q8. I personally had an instructional skill set applicable to online teaching prior to school closings.
Q9. The majority of my school's teachers had an instructional skill set applicable to online teaching prior to school closings.
Q10. I personally attended or read the preparatory materials, modules or training that were implemented to prepare for online teaching.
Q11. The majority of my school's teachers attended or read the preparatory materials, modules or trainings that were implemented to prepare for online teaching.
Q12. I personally felt confident in my ability to transition to online teaching and learning.
Q13. My university/higher education experience had adequately prepared me for a seamless transition to online teaching.
Q14. My district's professional development and teacher support had adequately prepared me for a seamless transition to online teaching.
Q15. My school's professional development and teacher support had adequately prepared me for a seamless transition to online teaching.
Q16. The majority of my school's teachers exhibited confidence in their ability to transition to online teaching and learning.
Q17. When executed correctly, students should receive the same level of instruction and learning in an online environment as they do in a face-to-face environment.
Q18. I am successfully executing the technical requirements of online teaching and learning.
Q19. I am teaching effective lessons with online teaching and learning.
Q20. The majority of my students are advancing their learning and growing in their understanding of course content as a result of online teaching and learning.
Q21. The integrity of the delivery of my course curriculum is intact through the use of online teaching and learning.
Q22. I have personally been observed by a school leader while delivering an online lesson during this school closure period.
Q23. The majority of students in my class(es) are taking the transition to online teaching and learning seriously.
Q24. The majority of teachers in my school are taking the transition to online teaching and learning seriously.
Q25. The parents, guardians, and family of the students in my class(es) are taking the transition to online teaching and learning seriously.
Q26. As a result of this transition to online teaching and learning, the students of my class (es) will be better prepared and more proficient with the knowledge and skills necessary to be career and college ready.
Q27. As a result of this transition to online teaching and learning, I will return to face-to-face teaching with a stronger set of instructional skills and knowledge.
Q28. The most significant instructional challenge faced during this time of school closures has been:
Q29. The most significant source of pride during this transition for me, as the classroom teacher, has been:
Q30. In preparing me for this transition to online teaching, what could have been done differently or more effectively from higher education?
Q31. In preparing me for this transition to online teaching, what could have been done differently or more effectively from my school district?
Q32. In preparing me for this transition to online teaching, what could have been done differently or more effectively from my individual school?