The Development and Validation of the Pre-Service Teacher Online Teaching Motivation Scale (PST-OTMS)

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Abstract

The purpose of the current study was to develop and validate the Pre-Service Teacher Online Teaching Motivation Scale (PST-OTMS), a survey instrument designed to reliably measure motivational constructs related to online teaching and learning in pre-service teachers. Due to increasing opportunities to teach within online learning contexts where challenges were magnified during the COVID-19 pandemic, a reliable and valid instrument is needed to measure such motivational constructs. The Pre-Service Teacher Online Teaching Motivation Survey (PST-OTMS) underwent a thorough validation process resulting in a 31-item survey aimed at assessing pre-service teacher motivation for online teaching across four dimensions: (1) pre-service teacher self-efficacy for online teaching, (2) pre-service teacher perceptions of online teaching and learning, (3) online teaching professionalism, and (4) pre-service teacher

anticipated administrative support for online teaching. The PST-OTMS demonstrated strong reliability and validity within the research context. Future research aims to widely administer the PST-OTMS to explore reliability and validity within additional settings and with a more diverse demographic.

Although not a new concept, online learning in K–12 education was initially seen as an outlier within the educational landscape and with a limited number of key players (Anderson & Simpson, 2012). Born from correspondence learning models, online K–12 schools started to come into view in the mid-1990s and gained limited momentum over the following two decades (Watson & Murin, 2014). However, few teacher preparation programs integrated curricula focusing on developing pedagogical skills for online teaching, creating a skills gap illuminated during the COVID-19 pandemic (Herold, 2021). Post-COVID, nationwide trends in opportunities to teach in online learning spaces have increased as schools launch more online options (Algaze, 2023). A few examples are the use of learning management systems within brick-and-mortar classrooms, mandatory e-learning days, and district technology initiatives that require teachers to integrate technology-based learning spaces into their daily practices (Wiles et al., 2023). Additionally, online schools have become much more of a mainstream option as the COVID-19 pandemic opened the door for many to consider the possibility of online education (Herold, 2021).

The changing virtual landscape and its continued integration into more traditional educational settings enhanced the critical need for teachers to be prepared to teach in online environments (Benedict et al., 2016). Given the connection between instructional outcomes and teacher motivation (Watt & Richardson, 2013), the motivation of pre-service teachers to teach in online environments has emerged as a critical construct. Broadly, motivation can be defined as "the processes that energize, direct, and sustain behavior" (Santrock, 2004, p. 414). Highly motivated pre-service teachers may be more likely to exhibit attitudes and behaviors conducive to building effective skills and dispositions for online teaching and learning (Backfisch et al., 2021). In response, the Pre-Service Teacher Online Teaching Motivation Scale (PST-OTMS) was developed to measure multiple motivational constructs relating to pre-service teachers' online teaching.

Although no current tool measures these same constructs in pre-service teachers, the Online Teaching Motivation Scale (OTMS) (Wiles et al., 2023) is a validated survey instrument designed to measure similar motivational constructs for in-service K–12 teachers. The OTMS measures K–12 teacher motivation for online teaching through three subscales: (1) teachers' self-efficacy for online teaching, (2) teachers' perceptions of online teaching and learning, and (3) teachers' perceived administrative support for online teaching. The current study details the development of an instrument derived from the OTMS that can evaluate pre-service teachers' motivation for online teaching and learning.

The current study aimed to develop and validate the Pre-Service Teacher Online Teaching Motivation Scale (PST-OTMS). The PST-OTMS is derived from the OTMS (Wiles et al., 2023) and builds upon this original instrument designed for in-service K–12 educators by adapting the three subscales of the OTMS to align with the new target population more closely and adding a construct that addresses the particular development needs of pre-service teachers.

The following research question guided our work:

How can we measure the following elements of pre-service teachers' (PSTs) motivation for online teaching reliably and validly?

- Self-efficacy for online teaching (operationally defined as PSTs' beliefs in their ability to teach online)

- Anticipated need for support of online teaching (operationally defined as PSTs' beliefs about how they are supported in their development of online teaching and learning skills)

- Online teaching professionalism (operationally defined as PSTs' beliefs about their ability to develop a personalized professional network that specifically supports their online teaching)

- Perceptions about online teaching and learning (operationally defined as PSTs' beliefs about the effectiveness of online teaching)

Review of Literature

Background of Online Learning Environments

Teaching within blended and online learning contexts was considered a regular part of the larger educational landscape before the pandemic (Green, 2019); however, within the K–12 space, using such environments as a mainstream practice had somewhat of an outlier status (Anderson & Simpson, 2012). Defined as emergency remote learning (Hodges et al., 2020), the immediate shutdown of schools and forced movement of classrooms to the online environment exposed gaps in teacher skills and knowledge needed to effectively teach within online learning contexts (Herold, 2021). Compared to courses designed and intentionally structured for online delivery, remote learning during this time was generally viewed as lower quality (DeVaney & Quintana, 2020; Hodges et al., 2020).

Post-pandemic, virtual learning spaces have become more prevalent, and courses previously offered only via face-to-face modalities are now considered for online or blended delivery (Baldwin-Clark, 2022). Yet, due to the residual effects of emergency remote learning, teacher motivation to add online components to classrooms is still an issue (Corrine, 2024). However, these environments are necessary in the educational landscape as they move towards further virtualization, even within more traditional contexts (Jayanthi et al., 2023). Therefore, the factors that support these motivations in teachers play a critical role in the effectiveness of online learning spaces and their impact on students (Johnson et al., 2023).

Motivation to use technology is related to both the quantity and quality of implementation (Backfisch et al., 2021). Consequently, teacher preparation programs will play a key role moving forward as they develop pre-service teachers (PSTs) and support the motivations of PSTs to teach and become effective within virtual environments, including opportunities to use educational technology (Paetsch & Drechsel, 2021).

Challenges in Online Learning Environments

As the expectations of integrating online learning into the face-to-face classroom have increased, PSTs have faced many challenges transitioning to in-service teaching (Carillo & Flores, 2020). These challenges include technical issues, engagement, providing a rich learning environment, and observation of the learning process when audiovisual tools are limited (Jin, 2023). Adding to those challenges, the fluidity of digital innovation and online content are consistent overarching challenges for PSTs (Yeung et al., 2014). Further complicating the challenges, PSTs' training may not fully address the evolving online environments they will encounter in the field (Hill, 2021).

Considering that instructional outcomes are related to teacher motivation (Watt & Richardson, 2013), pre-service teachers' motivation for teaching in online and hybrid modalities is critical to PST preparation; however, previous studies on motivation and PSTs do not specifically address their motivations to teach online. What is addressed is PSTs' motivation for *learning* online (Dorsah, 2021), PSTs' beliefs about the *motivation of their students* to learn online (Daniels et al., 2021), and PSTs' knowledge and self-efficacy to use technology (Lemon & Garvis, 2016). Similarly, when motivations for online teaching are discussed, the focus is on *in-service* teachers' motivations for teaching online (Uçar & Acar, 2022; Wiles et al., 2023) or teachers' motivation to use technology in the classroom (Paetsch & Drechsel, 2021; Backfisch et al., 2021). There is a gap in the literature about the dimensions of PSTs' motivations to teach online.

Teacher preparation programs face challenges that may contribute to the decreased motivation of PSTs to teach online (Carillo & Flores, 2020; Başaran & Yalman, 2022). The pandemic may have a residual impact on current PSTs who experienced emergency remote learning as K–12 students, which could result in negative preconceptions about pre-planned, intentional online pedagogy. Teacher preparation programs have an opportunity to support the progression of PST perceptions from emergency remote learning to evidence-based practices that are indicative of quality online course development and pedagogy (Carillo & Flores, 2020).

Addressing PSTs' efficacy for teaching in online learning environments presents an additional challenge. Anuar et al. (2022) explored three types of PST-related efficacies for online teaching. They found cognitive efficacy was the lowest of the three, suggesting that pre-service teachers are ready and willing to teach online but do not feel confident in their online pedagogy (Anuar et al., 2022). The challenge of supporting the development of cognitive efficacy is not just relevant to PSTs; many instructors who teach courses for PSTs may also lack confidence in their online teaching capabilities (Lieske et al., 2022). This may lead to a lack of effective modeling of quality online pedagogy, which can affect pre-service teachers' motivation (Keskin & Derya, 2020; Başaran & Yalman, 2022). This suggests that motivating PSTs through efficacy development may be more complex than originally thought.

Guiding Theories for PST-OTMS Development

The PST-OTMS was developed as a partner instrument to the OTMS (Wiles et al., 2023) and therefore is grounded in a similar theoretical model. The three guiding theories of motivation that form the foundations for the OTMS are also represented in the PST-OTMS. In response to research on pre-service teacher professional support structures, an additional construct, online teaching professionalism, was added to the PST-OTMS and is supported by the literature.

The three foundational theories represented in the PST-OTMS that directly align with the OTMS are Self-Efficacy Theory, Self-Perception Theory, and Leader-Member Exchange Theory (LMX). A full discussion of these theories is included in the initial OTMS validation study (Wiles et al., 2023). Below are brief definitions of these foundational theories, according to their connection to the PST-OTMS. The Personal Learning Network (PLN) Development theory, which supports the construction of online teaching professionalism, is explained in further detail since it was not addressed by the OTMS.

Self-Efficacy Theory (Bandura, 1977; Bandura, 1989)

Self-efficacy refers to the self-belief that one possesses the skills, ability, and knowledge to carry out a given task. Therefore, the self-efficacy of PSTs as it relates to online teaching is their belief that they possess the necessary skills, ability, and knowledge to effectively teach within online and technology-based learning environments.

Self-Perception Theory (Deci et al., 1999; Freedman & Fraser, 1966; Bem, 1972)

Self-perception refers to the process by which individuals develop attitudes and beliefs about the world based on their previous knowledge or experience. For example, PSTs may perceive online teaching as a negative component of education based on negative experiences they have had with it in their educational journey and vice versa.

Leader-Member Exchange Theory (LMX) (Dansereau et al., 1975)

Lord et al.'s (1985) and Eden and Leviatan's (1975) Implicit Leadership Theory provide a strong foundation for LMX (Dansereau et al., 1975). Individuals look for alignment in how they define a good leader and the actual behavior and characteristics of the leader. This relationship is the leader-member exchange. When members perceive alignment in the exchange, they generally view that leader as a good and supportive leader. LMX provides a framework by which the level and quality of interactions between leaders and members can be evaluated (Dansereau et al., 1975). When LMX is high, motivation to work for the leader increases. Although PSTs may not have an identified leader for their future classroom, they have informed opinions about what a good leader is. Therefore, they can determine what they perceive good LMX should look like and anticipate how those leaders could impact them in their future classrooms.

Personal Learning Network Development (Siemen, 2005; Martindale & Dowdy, 2010)

Grounded in Siemen's (2005) theory of connectivism and Martindale and Dowdy's (2010) concept of personal learning environments (PLNs) are highly customized, self-developed

networks of professional learning where personalized caches of resources can be collected and used by the learner (Moreillon, 2016). Generally developed over time, the learner is responsible for building a repository of online sources they store electronically. The network is highly customized and can be accessed anywhere and anytime. Although autonomously developed, PLNs allow PSTs to connect and collaborate with experts currently working in the field (Moreillon, 2016).

There is a connection between understanding what resources are available to support general teaching practices and teaching motivation (Odone, 2019); however, the learner must know where and how to locate solid and reliable resources as they develop their PLN. PSTs need to be confident in their ability to locate and use resources that appropriately support their professional development and find platforms where the organization of those resources is easy and accessible.

Existing Online Teaching and Learning Surveys

Several surveys exist that address teacher attitudes about online and technology-based teaching; however, none address the motivations of PSTs to teach online. The Technology Acceptance Model (TAM) (Davis, 1989) is frequently cited within educational contexts as a measure of how educators accept educational technology as a usable tool for their classrooms. When used in educational contexts, initial versions of the TAM were mainly used to measure the technology acceptance of in-service teachers. Teo (2010) extended and validated a PST version of the TAM branded as the Technology Acceptance Model for Preservice Teachers (TAMPST). While Teo (2012) found that PST attitudes toward technology predicted its use in experiences designed by PSTs, the TAMPST does not address the motivations of PSTs. Also, the TAMPST is a general tool for technology and may not appropriately measure the use of online learning environments.

Archibald et al. (2021), Graham et al. (2018), and Los et al. (2021) developed scales to measure blended and/or online teaching readiness of teachers with the Blended Teaching Readiness Instrument (BTRI) (Archibald et al., 2021), K–12 Blended Teaching Readiness Instrument (Graham et al., 2018), and the Online and Blended Teaching Readiness Assessment (OBTRA) (Los et al., 2021) In each case, readiness to teach in blended and/or online environments is appropriately addressed, and the assessment of readiness and competency to teach in such environments is evident; however, motivation is not specifically addressed in any of the measures. Interestingly, readiness and motivation to teach may have a connection, but further research is needed to validate this possibility. The interactions between motivation and readiness may eventually predict the frequency and quality of instruction; however, the instruments are designed for either different learning environments or different target populations than the PST-OTMS.

One of the most frequently cited models of technology integration is Mishra and Koehler's (2006) Technological, Pedagogical, and Content Knowledge (TPACK) framework. Numerous surveys have been developed from the TPACK framework. Two specific surveys

developed from the TPACK model specifically address the TPACK skills of PSTs (Ritzhaupt et al., 2016; Yilmaz Ozden, 2015). However, these surveys treat technology use and instruction more generally than the PST-OTMS.

The existing instruments measure technology-based constructs necessary in modern day educational contexts; however, none effectively measure multiple aspects of PST motivation for online teaching. The PST-OTMS fills a niche that has found rapid relevance since the COVID-19 pandemic as an instrument that specifically investigates PSTs' motivation to teach online.

The present study aims to develop and validate the Pre-Service Teacher Online Teaching Motivation Scale (PST-OTMS). Serving as a partner instrument to the OTMS (Wiles et al., 2023), the PST-OTMS extends the original instrument, developed for K–12 educators, to focus on pre-service teachers' motivation. By modifying the existing scales of the OTMS and incorporating an additional construct, the PST-OTMS offers a valid and reliable tool for assessing the motivation of PSTs toward online teaching and learning.

Method

<u>Initial Survey Development</u>

As previously noted, the PST-OTMS items were derived from the Online Teaching Motivation Scale (OTMS) (Wiles et al., 2023). After careful examination of the constructs of the OTMS and a review of the literature, alignment was evident between the factors addressed by the OTMS and factors supporting pre-service teachers' motivation for online teaching and learning; therefore, the following subscales of the OTMS were adapted and included in the PST-OTMS: (1) support for online teaching, (2) self-efficacy for online teaching, and (3) perceptions about online teaching and learning. It should be noted that the context of support for online teaching was modified to *anticipate the need for support* of online teaching to reflect how PSTs might view that subscale. In addition, literature on pre-service teachers' motivation for online teaching and learning pointed to the need to add a fourth factor to the PST-OTMS. Research suggests that the ability of pre-service teachers to locate and foster a personal, professional network to support their teaching with technology is related to motivation for teaching in online learning environments (Alwafi et al., 2020; Garrison et al., 2020) In response to this, a scale was added to the PST-OTMS to measure this construct. Items within this fourth subscale were written in alignment with the literature on elements of professional support for online learning in pre-service teachers (Kearney & Maher, 2019; Kearney et al., 2019; Reich, 2011; Alwafi et al., 2020; Garrison et al., 2020).

The resulting four subscales of the PST-OTMS are supported by motivation and professional development theories, as outlined in the Literature Review. The theoretical framework for the PST-OTMS is grounded in self-efficacy theory (Bandura, 1977; Bandura, 1989), self-perception theory (Deci et al., 1999; Freedman & Fraser, 1966; Bem, 1972), leadership-member exchange theory (Lord et al.,1985; Eden & Leviathan, 1975), and professional learning network theory (Martindale & Dowdy, 2010). Guided by these theories and building upon the OTMS (Wiles et al., 2023), an initial survey was drafted. The initial PST-

OTMS consisted of 40 Likert-style items. The item breakdown by subscales is as follows: (1) perceptions of online teaching and learning (8 items), (2) self-efficacy for online teaching (10 items), (3) anticipated need for support of online teaching (9 items), and (4) online teaching professionalism (7 items). Respondents were prompted to indicate their level of agreement on a four-point Likert-type scale: disagree, somewhat disagree, somewhat agree, or agree.

It should also be noted that the PST-OTMS differs from the OTMS in both the structure and context of questions. The item structure of the PST-OTMS was modified from the original OTMS. The items on the PST-OTMS are grouped by construct while the OTMS used a randomized order of questions. This change was made to reduce the cognitive load that scrambled items can challenge for those unfamiliar or new to a given topic. Random itemization requires respondents to oscillate between scales without the ability to contextualize the factor (Rush et al., 1981; Solomon & Kopelman, 1984); therefore, items were grouped by subscale, and a brief identification of the factor was placed at the beginning of each grouping.

Initial Content Review

After the initial survey development, a team of four researchers skilled in survey validation assessed the face validity of the PST-OTMS through content expert review. Since the three subscales drawn from the OTMS have been validated in a previous study (Wiles et al., 2023), the initial phase of content review was focused on the items in the "Online Teaching Professionalism" subscale. The content experts evaluated the items in alignment with Gentry and Gable's (2001) confidence method. Once any items under the confidence threshold had been eliminated, a psychometrician reviewed the complete PST-OTMS for face validity as a measure of pre-service teachers' motivation for online teaching and learning. Seven items were eliminated during this process. The final step of the face validity testing was distributing the survey to a focus group of pre-service teachers (n = 3). Two researchers met virtually with individual focus group participants and showed them one survey question at a time. Participants were instructed to read each question, reflect on the item, and indicate any questions or comments. At the end of each meeting, the focus group was asked to provide general feedback. Although no questions were eliminated based on focus group feedback, ten questions were updated to enhance grammar, specificity, clarity, semantics, purpose, or consistency.

Survey Implementation: Participants and Setting

Data for this quantitative study were collected at a large public university in the midwest United States. All participants were enrolled full-time in a teacher education program and were therefore categorized as pre-service teachers (PSTs). Participants were all enrolled in a face-to-face introductory educational technology class. The survey link was emailed to 154 participants and a total of 130 participants completed the PST-OTMS; however, one participant's response contained missing values with no answers provided for the survey items. Therefore, the number of valid responses for the analysis was 129. Participant demographics are presented in Table 1.

Table 1

Participant Demographics (N =129)

	N	%
Gender		
Male	36	27.9
Female	90	69.8
Non-binary/third gender	1	.8
Prefer not to say	2	1.6
Modality prefers to learn		
Online	5	3.9
Face-to-face	110	85.3
No preference	14	10.9
Student type		
Traditional	127	98.4
Non-traditional	2	1.6

Note. Traditional student = I am a full-time undergraduate enrolled at a college/university shortly after high school/secondary school. I generally attend classes on campus and am under the age of 25. Non-traditional student = I delayed my college/university enrollment for at least several years after high school/secondary school. I balance school and a job/career and am over the age of 25.

Results

Validity of Measure

Given that the PST-OTMS is a newly established survey instrument, an exploratory factor analysis (EFA) was used to explore the underlying structure of factors among the survey items. Specifically, principal axis factoring was adopted for dimension reduction. The number of factors to be extracted was fixed at four to align with the theoretical framework grounded by the PST-OTMS Survey. Oblique rotation was employed considering the potential correlations among the the factors. Factor loadings greater than 0.3 and less than 0.4 are considered acceptable (Field, 2013), while factor loadings greater than 0.4 are considered stable (Guadagnoli & Velicer, 1988). Additionally, Cronbach's Alpha was computed to examine the internal consistency within each extracted factor.

Based on the initial EFA results, three items were eliminated from the initial pool for different reasons. First, the item, "I am confident in my ability to use the technology required to teach in an online environment," was eliminated due to redundancy with another item conveying the same concept. Second, the item "Online learning allows for sufficient communication with parents" was eliminated because it is not student-learning focused and has an unacceptable factor loading (<.30). Third, the item "It is important for my school or district leaders to provide constructive feedback about my online teaching" was eliminated because of notable loadings onto two factors "support of online teaching" (.423) and "online teaching professionalism" (.313). These revisions resulted in a final version of the PST-OTMS, consisting of 31 items

distributed across four factors. We re-ran the EFA and found that the 31 items were loaded onto four factors, and their factor loadings ranged from .366 to .831. Detailed factor loadings of the 31 items are presented in Table 2.

A value of .823 determined from the Kaiser-Meyer-Olkin test indicated a good level of sample adequacy. The retained four factors collectively accounted for 52.4 % of item variance. Cronbach's Alpha for the four factors was: .821 for "Perceptions of Online Teaching and Learning," .872 for "Self-Efficacy for Online Teaching," .862 for "Online Teaching Professionalism," and .828 for "Anticipated Need for Support of Online Teaching," indicating high internal consistency for all factors.

Table 2

Factor loadings (31 items)

	Factor			
	1	2	3	4
I am confident in my ability to make online learning engaging for students.	.740			
When teaching online, I feel confident I can meet each individual student's needs.	.739			
I am confident in my ability to effectively deliver content to students online.	.699			
I am confident in my ability to formatively assess student learning in an online environment.	.663			
I am confident in my ability to nurture students' social-emotional needs in an online environment.	.639			
I am confident in my ability to respond to students' academic challenges in an online environment.	.628			
I feel confident in my ability to manage student behavior in an online environment.	.619			
I am confident that I can become proficient with the technology needed to be an effective online educator.	.491			
I am confident in my ability to manage my time while teaching online.	.366			
I will need my school or district leaders to offer technical support to effectively deliver online instruction.		.785		

I will need my school or district leaders to provide training to support my development as an online educator.	.654		
I will need my school or district leaders to support me in developing my online curriculum.	.642		
I need my school or district leaders to support my professional decisions in my online teaching.	.640		
I will need my school or district leaders to provide guidance in assessing student learning in an online environment.	.636		
It is important for my school or district leaders to ensure I have a support system of other colleagues that I can contact for help during online teaching.	.566		
I will need my school or district leaders to be encouraging throughout the process of online teaching.	.541		
It is important that my school or district leaders have well-defined expectations of me as an online educator.	.534		
I know where to locate professional learning networks for online educators.		.831	
I know how to locate resources that support my development as an online educator.		.788	
I know where to locate current research in the field of online teaching.		.704	
I can create a personal professional learning plan that includes resources for teaching online.		.689	
I know where to locate professional standards for online educators that support my development as a professional.		.579	
I can set personal professional learning goals that are directly applicable to teaching online.		.568	
I believe online learning is an effective form of instruction for students.			.825
I believe that students can learn effectively in an online environment.			.676
I believe students are motivated to learn in an online environment.			.607

I believe online instruction allows for meaningful interaction among students.	.554
Online learning provides a positive learning environment for students.	.553
I believe students can learn as effectively through online instruction as through face-to-face instruction.	.518
I believe that online learning is the best fit for some students.	.450
I believe online education has increased equity in education.	.395

Discussion

This study demonstrates that the PST-OTMS is a valid and reliable measure of PSTs' motivation for online teaching. Exploratory factor analysis supports the validity of a four-factor solution to measure the following components of PSTs' motivation: (1) self-efficacy for online teaching, (2) anticipated need for support of online teaching, (3) perceptions of online teaching and learning, and (4) online teaching professionalism. Given the connection between instructional outcomes and teacher motivation (Watt & Richardson, 2013), the motivation of pre-service teachers to engage in online/hybrid teaching methods is a crucial aspect of their preparation. Nonetheless, existing studies on pre-service teacher motivation lack specific exploration into their inclination to teach online. The 31-item PST-OTMS has the potential to inform our understanding of the factors influencing PSTs' pedagogy in digital learning environments and fill a gap in the current research literature.

Research suggests that the effects of the COVID-19 pandemic may linger for present PSTs who underwent emergency remote learning during their time as students (Carillo & Flores, 2020; Başaran & Yalman, 2022). Consequently, some PSTs may hold negative attitudes about online learning based on their experiences during the COVID-19 pandemic. The PST-OTMS offers an opportunity to effectively measure PSTs' attitudes toward online learning and uncover any negative perceptions that could impact future pedagogy in K–12 digital learning environments. Faced with an educational landscape that is increasingly grounded in digital learning experiences, it is imperative to foster positive perceptions of online teaching and learning in PSTs. The first step of this process is to identify current attitudes; the PST-OTMS provides a mechanism to accomplish this goal.

In addition to fostering positive perceptions of online learning, the PST-OTMS can potentially impact PSTs' efficacy for online teaching. Research suggests that many PSTs lack strong models of effective online teaching (Keskin & Derya, 2020; Başaran & Yalman, 2022); as a result, their efficacy for online teaching may suffer. By identifying PSTs who exhibit low self-efficacy, teacher educators can implement strategies to support the development of self-efficacy, thereby increasing the likelihood that these novice educators will experience success in digital

learning environments in the future. If PSTs leave teacher education programs with uncovered deficits in efficacy for online teaching, they may enter their future classrooms lacking the confidence necessary to thrive in digital learning environments. Hence, the PST-OTMS provides a valid measure of PSTs' self-efficacy for online teaching and can lead to interventions to support growth in this critical area.

Another critical construct for PSTs is their ability to effectively find and use resources to strengthen and support their pedagogy. In a world where information is abundant and ever-changing, educators need to possess the ability to identify sources of professional guidance and support. The PST-OTMS provides a valid measure of PSTs' online teaching professionalism. This measure has the potential to highlight an educator's strengths and weaknesses in navigating the abundance of professional resources in their field. This includes the PST's ability to locate quality research on online teaching and learning and to navigate and apply professional standards for digital learning environments. In addition to informational resources, the PST-OTMS also measures educators' ability to locate and effectively integrate professional experts, fellow novice teachers, and other human resources into their PLN toolbox. Identifying areas for growth in this area may allow teacher educators to develop targeted workshops or units of study aimed at teaching PSTs how to effectively navigate professional sources of information and support in online teaching and learning.

Lastly, the PST-OTMS is a valid measure within this research context of PSTs' anticipated need for support of online teaching. This subscale focuses on the types of support PSTs anticipate needing from their school and district administrators when they enter the classroom. Being able to capture this information proactively would be especially helpful for school administrators who will be tasked with providing effective support to novice teachers in their buildings. Additionally, the information can be used by teacher preparation programs to direct PSTs to possible avenues through which the support may come. This PST-OTMS subscale details the level of support PSTs feel they will need to be successful in digital learning environments when they enter the field. This includes technical support, professional development, support for developing online learning experiences, and guidance for assessing students in online environments. Administrators can use this information to proactively build support systems that may allow pre-service teachers to transition more smoothly into in-service positions. Research suggests that when teachers are embedded within effective support systems, it correlates with positive outcomes such as teacher retention and job satisfaction (Ventista & Brown, 2023).

Limitations

Although the current study supports the PST-OTMS as a reliable and valid measure within the context of PST motivations for online teaching, there are several notable limitations. First, the sample was drawn from one public university in the Midwest and the vast majority of the responding PSTs were enrolled in a single academic program. As a result, the sample was not randomized and relied instead on convenience sampling. In addition, sampling participants from the same university and same academic program is not ideal for representing a variety of

demographics and participant characteristics. These factors may necessitate further testing of the PST-OTMS with more diverse populations to provide additional insights about the psychometric properties of the instrument.

Another limitation of this study lies in the self-report nature of survey instruments like the PST-OTMS. The PST-OTMS requires participants to self-report elements of their motivation for online teaching and learning and to make a reflective judgment about each item. Generally, self-reported surveys are limited by the sincerity and introspective capacity of the participants. As such, the self-report nature of the items of the PST-OTMS may affect the reliability and validity of the instrument. However, this limitation is common to the development of all survey measures that require participants to self-report internal constructs.

Participants bring to the table myriad prior experiences related to online teaching and learning, which could affect their self-reported responses on the PST-OTMS. For example, it should be noted that this group of participants likely brought additional extraneous variables to the table. Due to the year the participants entered their post-secondary education, some of their high school education occurred during the pandemic. Therefore, their perceptions of the online learning environment may be biased by their experiences during emergency remote learning. Although terms were defined for participants, some participants may hold different definitions for *online teaching and learning* which could have affected their responses to PST-OTMS items. As common definitions are critical in validating survey instruments, these differing semantics may have influenced the results of this study.

Future Research

This research study is just the starting point of the PST-OTMS instrument evolution. The current study supports the continued development of reliability and validity results of the PST-OTMS to further validate the promising results of this research study. However, further testing and continual evaluation of the instrument is needed. During this study, the instrument was validated through an EFA. Therefore, the potential use of and confidence in the instrument beyond the scope of this validation cycle is still unknown. Further research should include a confirmatory factor analysis (CFA) to provide insight into the reliability and validity of the factor structure on other collected data. Additionally, exploration of other contexts and populations will further confirm reliability and validity of the instrument.

For example, the use of the PST-OTMS instrument should be explored with more diverse geographical and demographic populations. Expansion of the theoretical framework is another possible avenue of research. As we move further from the pandemic and online teaching and learning experiences are perceived from a different context, additional factors may emerge as a part of the equation. In addition, the application of the PST-OTMS in pre-service teacher preparation programs as a pre-and post-measure might provide insight into how well those programs are preparing teachers to teach within technology-based learning environments. Post-COVID, teacher preparation programs have a prime opportunity to support the development of

quality online pedagogical skills in their teacher candidates. The PST-OTMS may function as a critical assessment of the process.

Declarations

References

Algaze, L. (2023). Online learning can help with teacher shortages. *California Schools, Winter*. https://publications.csba.org/issue/winter-2023/online-learning-can-help-with-teacher-shortages/

Anuar, P. F. R. F., Teoh, S.-H., & Koo, A.-C. (2022). Preservice teachers' teaching efficacy and motivation in Online Learning (OL). *International Journal of Academic Research in Progressive Education and Development, 11*(4), 476–487. http://dx.doi.org/10.6007/IJARPED/v11-i4/15871

Archambault, L. (2014). Teaching virtually: Strategies and challenges in the 21st century online classroom. *International Journal of Online Pedagogy and Course Design*, *4*(1), 1–15. https://doi.org/10.4018/ijopcd.2014010101

Archibald, D. E., Graham, C. R., & Larsen, R. (2021). Validating a blended teaching readiness instrument for primary/secondary preservice teachers. *British Journal of Educational Technology*, *52*(2), 536–551. https://doi.org/10.1111/bjet.13060

Backfisch, I., Lachner, A., Stürmer, K., & Scheiter, K. (2021). Variability of teachers' technology integration in the classroom: A matter of utility. *Computers and Education*, *166*, 104159. https://doi.org/10.1016/j.compedu.2021.104159

Baldwin-Clark, T. C. (2022). A joke no more: Online education in the face of COVID-19. *Local Development & Society*, *3*(2), 293–297. https://doi.org/10.1080/26883597.2021.1935303

Başaran, B., & Yalman, M. (2022). Determining the perceptions of pre-service teachers on technology-based learning during the Covid-19 process: A latent class analysis approach. *Education and Information Technologies*, *27*(6), 7471–7490. https://doi.org/10.1007/s10639-022-10910-2

Benedict, A., Holdheide, L., Brownell, M., & Foley, A. M. (2016). Learning to teach: Practice-based preparation in teacher education. Special Issues Brief. *Center on Great Teachers and Leaders*. https://ceedar.education.ufl.edu/wp-content/uploads/2022/03/CEEDAR-Virtual-Teacher-Prep.pdf

Billington, B. (2023). *A case study: Exploring pre-service teachers' readiness for teaching in K–12 online learning environments while enrolled in a university-based teacher preparation program* [Doctoral dissertation, Drexel University]. Drexel Libraries. https://researchdiscovery.drexel.edu/esploro/outputs/doctoral/A-Case-Study-Exploring-Pre-Service-Teachers/991020879314204721

Brabeck, M. M., Dwyer, C. A., Geisinger, K. F., Marx, R. W., Noell, G. H., Pianta, R. C., Worrell, F. C. (2014). Assessing and evaluating teacher preparation programs. *APA Task Force Report*. https://www.apa.org/ed/schools/teaching-learning/teacher-preparation-programs.pdf

Carrillo, C., & Flores, M. A. (2020). COVID-19 and teacher education: A literature review of online teaching and learning practices. *European Journal of Teacher Education*, *43*(4), 466–487. https://doi.org/10.1080/02619768.2020.1821184

Coppe, T. (2023). Teacher networks: From a catalyst for enactment of professional development to a source of professional development. *Teachers and Teaching*, 1–14. https://www.tandfonline.com/doi/full/10.1080/13540602.2023.2263734

Crawford, J., Butler-Henderson, K., Rudolph, J., Malkawi, B., Glowatz, M., Burton, R., ... & Lam, S. (2020). COVID-19: 20 countries' higher education intra-period digital pedagogy responses. *Journal of Applied Learning & Teaching*, *3*(1), 1–20. https://doi.org/10.37074/jalt.2020.3.1.7

Dansereau, F., Graen, G., & Haga, W. J. (1975). A vertical dyad linkage approach to leadership within formal organizations: A longitudinal investigation of the role making process. *Organizational Behavior and Human Performance*, *13*(1), 46–78.

Daniels, L. M., Goegan, L. D., Radil, A. I., & Dueck, B. S. (2021). Supporting pre-service teachers' motivation beliefs and approaches to instruction through an online intervention. *British Journal of Educational Psychology*, *91*(2), 775–791. https://doi.org/10.1111/bjep.12393

Davis, F. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340.

DeVaney, X., & Quintana, X. (2020, April 15). Preparing for future disruption: Hybrid, resilient teaching for a new instructional age. *Inside Higher Education*. https://www.insidehighered.com/blogs/learning-innovation/preparing-future-disruption-hybrid-resilient-teaching-new-instructional

Dorsah, P. (2021). Pre-service teachers' readiness for emergency remote learning in the wake of COVID-19. *European Journal of STEM Education*, *6*(1), 01. https://doi.org/10.20897/ejsteme/9557

Field, A. (2013). *Discovering statistics using IBM SPSS statistics*. Sage.

Flemming, N. (2021). How to get a teaching job in 2021. *Edutopia*. Retrieved from https://www.edutopia.org/article/how-get-teaching-job-2021

Graham, C. R., Borup, J., Pulham, E., & Larsen, R. (2019). K–12 blended teaching readiness: Model and instrument development. *Journal of Research on Technology in Education*, *51*(3), 239–258. https://www.tandfonline.com/doi/abs/10.1080/15391523.2019.1586601?casa_token=lQteaOJbShMAAAAA:cNy88yo1d_izgypctN3_SyahTD99zIXpub1Z776bhFMZzpKxItzIHq_D3Ht9Qc3JF59dSQE5GkBqCNOBAg

Green, J. (2023). Paradoxical narratives about online learning during the COVID-19 pandemic: The struggle was real, but so was the resilience. *Journal of Latinos and Education*, 1–15.

Green, L. S. (2019). Online learning is here to stay: Librarians transform into digital instructors. *American Libraries, 50*(6). https://americanlibrariesmagazine.org/2019/06/03/online-learning-is-here-to-stay/

Guadagnoli, E., & Velicer, W. F. (1988). Relation of sample size to the stability of component patterns. *Psychological Bulletin*, *103*(2), 265.

Hill, J. B. (2021). Pre-service teacher experiences during COVID 19: Exploring the uncertainties between clinical practice and distance learning. *Journal of Practical Studies in Education*, *2*(2), 1–13. https://doi.org/10.46809/jpse.v2i2.18

Herold, B. (2021). Remote learning is changing schools. Teacher-preparation programs have to adjust. *Education Week*. https://www.edweek.org/teaching-learning/remote-learning-is-changing-schools-teacher-preparation-programs-have-to-adjust/2021/05

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

Jayanthi, K., Priya, M. S., Saranya, S., Gomathi, R., & Sam, D. (2023). E-learning as a desirable form of education in the era of Society 5.0. In *Advances in Distance Learning in Times of Pandemic* (pp. 23–51). Chapman and Hall/CRC. https://www.taylorfrancis.com/chapters/edit/10.1201/9781003322252-2/learning-desirable-form-education-era-society-5-0-jayanthi-sugantha-priya-saranya-gomathi-dahlia-sam

Jin, M. (2023). Preservice teachers' online teaching experiences during COVID-19. *Early Childhood Education Journal*, *51*(2), 371–381. https://doi.org/10.1007/s10643-022-01316-3

Johnson, C. C., Walton, J. B., Strickler, L., & Elliott, J. B. (2023). Online teaching in K–12 education in the United States: A systematic review. *Review of Educational Research*, *93*(3), 353–411. https://journals.sagepub.com/doi/abs/10.3102/00346543221105550

Kearney, M., & Maher, D. (2019). Mobile learning in pre-service teacher education: Examining the use of professional learning networks. *Australasian Journal of Educational Technology*, *35*(1). https://ajet.org.au/index.php/AJET/article/view/4073/1543

Kearney, M., Maher, D., & Pham, L. (2020). Investigating pre-service teachers' informally-developed online professional learning networks. *Australasian Journal of Educational Technology*, *36*(1), 21–36. https://ajet.org.au/index.php/AJET/article/view/4766/1601

LeBourdais, C. (2024). *Immediate and residual effects of emergency remote teaching: A Canadian case study* [Doctoral dissertation, Athabasca University]. DTheses. . https://dt.athabascau.ca/jspui/handle/10791/437

Lemon, N., & Garvis, S. (2016). Pre-service teacher self-efficacy in digital technology. *Teachers and Teaching, Theory and Practice*, *22*(3), 387–408. https://doi.org/10.1080/13540602.2015.1058594

Lieske, P., Wetzl, A., & Mechenbier, M. X. (2022). Teaching during a pandemic: A study of instructors' preparedness for online composition delivery. *Composition Studies*, *50*(3), 59–207.

Los, R., De Jaeger, A., & Stoesz, B. M. (2021, October). Development of the online and blended teaching readiness assessment (OBTRA). In *Frontiers in Education* (Vol. 6. Frontiers. https://www.frontiersin.org/articles/10.3389/feduc.2021.673594/full

Martindale, T., & Dowdy, M. (2010). Personal learning environments. *Emerging Technologies in Distance Education*, *7*, 177–193.

Mishra, P., & Koehler, M. J. (2006). Technological pedagogical content knowledge: A framework for teacher knowledge. *Teachers College Record*, *108*(6), 1017–1054. https://doi.org/10.1111/j.1467-9620.2006.00684.x

Moreillon, J. (2016). Building your personal learning network (PLN): 21st-century school librarians seek self-regulated professional development online. *Knowledge Quest*, *44*(3), 64–69. https://www.proquest.com/docview/1770101663?pq-origsite=gscholar&fromopenview=true&sourcetype=Dissertations%20&%20Theses

Oddone, K., Hughes, H., & Lupton, M. (2019). Teachers as connected professionals: A model to support professional learning through personal learning networks. *International Review of Research in Open and Distributed Learning*, *20*(3). https://www.erudit.org/en/journals/irrodl/2019-v20-n3-irrodl04799/1062524ar/

Ormrod, J. E. (2006). *Essentials of educational psychology*. Merrill Prentice Hall.

Paetsch, J., & Drechsel, B. (2021). Factors influencing pre-service teachers' intention to use digital learning materials: A study conducted during the COVID-19 pandemic in Germany. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.733830

Poortman, C. L., Brown, C., & Schildkamp, K. (2022). Professional learning networks: A conceptual model and research opportunities. *Educational Research*, *64*(1), 95–112. https://www.tandfonline.com/doi/full/10.1080/00131881.2021.1985398

Ritzhaupt, A. D., Huggins-Manley, A. C., Ruggles, K., & Wilson, M. (2016). Validation of the survey of pre-service teachers' knowledge of teaching and technology: A multi-institutional sample. *Journal of Digital Learning in Teacher Education*, *32*(1), 26–37. https://doi.org/10.1080/21532974.2015.1099481

Schriesheim, C. A., Kopelman, R. E., & Solomon, E. (1989). The effect of grouped versus randomized questionnaire format on scale reliability and validity: A three-study investigation. *Educational and Psychological Measurement*, *49*(3), 487–508.

Siemens, G. (2004). Connectivism: A learning theory for the digital age. *Journal of Instructional Technology and Distance Learning,* 2(1). , http://www.itdl.org/Journal/Jan_05/article01.htm

Simpson, M., & Anderson, B. (2012). History and heritage in open, flexible and distance education. *Journal of Open, Flexible, and Distance Learning*, *16*(2), 1–10. https://files.eric.ed.gov/fulltext/EJ1080085.pdf

Strauss, V. (2021). New report provides reality check on virtual schools. *The Washington Post*. https://www.washingtonpost.com/education/2021/05/06/reality-check-on-virtual-schools/

Teo, T. (2010). The development, validation, and analysis of measurement invariance of the Technology Acceptance Measure for Preservice Teachers (TAMPST). *Educational and Psychological Measurement*, *70*(6), 990–1006. https://doi.org/10.1177/0013164410378087

Teo, T. (2012). Examining the intention to use technology among pre-service teachers: An integration of the Technology Acceptance Model and Theory of Planned Behavior. *Interactive Learning Environments*, *20*(1), 3–18. https://doi.org/10.1080/10494821003714632

Uçar, R., & Acar, C. (2022). Virtual class management experiences of teachers. *International Journal of Psychology and Educational Studies*, *9*, 1085–1098. https://doi.org/10.52380/ijpes.2022.9.4.903

Ventista, O. M., & Brown, C. (2023). Teachers' professional learning and its impact on students' learning outcomes: Findings from a systematic review. *Social Sciences & Humanities Open*, *8*(1), 100565. https://www.researchgate.net/publication/371111711_Teachers'_professional_learning_a nd_its_impact_on_students'_learning_outcomes_Findings_from_a_systematic_review

Watson, J., & Murin, A. (2014). A history of K–12 online and blended instruction in the United States. In Ferdig, R. & Kennedy, K (Eds.) *Handbook of research on K–12 online and blended learning* (pp. 1–23). ETC Presshttps://dl.acm.org/doi/epdf/10.5555/2811036.2811038

Watt, H. M. G., & Richardson, P. W. (2013). Teacher motivation and student achievement outcomes. In *International guide to student achievement* (pp. 271–273). Taylor & Francis. https://doi.org/10.4324/9780203850398-90

Wiles, D., Morrison, A., Smart, J., Bennett, L., & Peters, S. (2023). The Online Teaching Motivation Scale (OTMS): Development and validation of a survey instrument. *Online Learning*, *27*(4).

Wilhelm, A. G., Woods, D., del Rosal, K., & Wu, S. (2020). Refining a professional network. *Teacher Education Quarterly*, *47*(3), 96–119. https://www.jstor.org/stable/26977517

Yeung, A. S., Tay, E. G., Hui, C., Lin, J., & Low, E.-L. (2014). Pre-service teachers' motivation in using digital technology. *The Australian Journal of Teacher Education*, *39*(3), 135–153. https://doi.org/10.14221/ajte.2014v39n3.1

Yilmaz Ozden, S. (2015). *Designing and validating a survey to measure technological, pedagogical and content knowledge among pre-service teachers* (Publication No. 1727750833) [Doctoral Dissertation, University of Delaware]. ProQuest Dissertations and Theses Global. https://www.proquest.com/dissertations-theses/designing-validating-survey-measure-technological/docview/1727750833/se-2

Appendix A

Pre-service Teacher Online Teaching Motivation Survey
(PST-OTMS)

Thank you for completing the Pre-service Teacher Online Teaching Motivation Survey.

<u>Directions</u>: For each item, please answer to the best of your knowledge.

The first five items are demographic items. There are then 31 multiple-choice items. For each of these items, think about your **future** <u>online/virtual/hybrid</u> teaching experience. Think about your current understandings and beliefs about online teaching and how it will impact your teaching

When thinking about online/virtual/hybrid, please consider any online teaching you believe you will likely use. This can include (but is not limited to):
- Virtual instruction
- e-Learning days (e.g., inclement weather days, quarantine days)
- Students working on Chromebooks, iPads, or other technology devices during learning centers
- Students using Chromebooks, iPads, or other technology devices for assessment *
- Students using learning apps (e.g. Dreambox, Epic, Kiddle, Flipgrid, Padlet, Google Docs, etc.)

If you plan to utilize any virtual/online instruction in your classroom during normal in-person instructional hours we would consider this to be 'Online and Face-to-Face' or hybrid.

For the final 31 items (the non-demographic items), please indicate your level of agreement with each statement by selecting the appropriate response (Disagree, Somewhat Disagree, Somewhat Agree, Agree).

Item	Question	Rating
Demographic Questions		
	With which gender do you identify?	Male Female Non Binary/3rd Gender Prefer not to say
	In what state do you attend school?	
	What grade level do you plan to teach?	
	In what modality do you prefer to learn?	
	Based on the following definitions of traditional and non-traditional student, which do you identify as: • Traditional student- I am a full-time undergraduate who enrolled at a college/university shortly out of high	Traditional Non-traditional

	school/secondary school. I generally attend classes on campus and am under the age of 25. • Non-traditional student- I delayed my college/university enrollment for at least several years after high school/secondary school. I balance school and a job/career and am over the age of 25.	
Self-Efficacy for Online Teaching		
1	I am confident in my ability to make online learning engaging for students.	Disagree Somewhat Disagree, Somewhat Agree Agree
2	When teaching online, I feel confident I can meet each individual student's needs.	Disagree Somewhat Disagree, Somewhat Agree Agree
3	I feel confident in my ability to manage student behavior in an online environment.	Disagree Somewhat Disagree, Somewhat Agree Agree
4	I am confident in my ability to nurture students' social-emotional needs in an online environment.	Disagree Somewhat Disagree, Somewhat Agree Agree
5	I am confident in my ability to effectively deliver content to students online.	Disagree Somewhat Disagree, Somewhat Agree Agree
6	I am confident in my ability to formatively assess student learning in an online environment.	Disagree Somewhat Disagree, Somewhat Agree Agree
7	I am confident in my ability to respond to students' academic challenges in an online environment.	Disagree Somewhat Disagree, Somewhat Agree Agree
8	I am confident in my ability to manage my time while teaching online.	Disagree Somewhat Disagree, Somewhat Agree Agree
9	I am confident that I can become proficient with the technology needed to be an effective online educator.	Disagree Somewhat Disagree, Somewhat Agree Agree
Anticipated Need for Support of Online Teaching		

10	I will need my school or district leaders to offer technical support to effectively deliver online instruction.	Disagree Somewhat Disagree, Somewhat Agree Agree
11	I will need my school or district leader to provide training to support my development as an online educator.	Disagree Somewhat Disagree, Somewhat Agree Agree
12	I need my school or district leaders to support my professional decisions in my online teaching.	Disagree Somewhat Disagree, Somewhat Agree Agree
13	I will need my school or district leaders to support me in developing my online curriculum.	Disagree Somewhat Disagree, Somewhat Agree Agree
14	I will need my school or district leaders to provide guidance in assessing student learning in an online environment.	Disagree Somewhat Disagree, Somewhat Agree Agree
15	I will need my school or district leaders to provide guidance in assessing student learning in an online environment.	Disagree Somewhat Disagree, Somewhat Agree Agree
16	It is important for my school or district leaders to ensure I have a support system of other colleagues that I can contact for help during online teaching.	Disagree Somewhat Disagree, Somewhat Agree Agree
17	It is important that my school or district leaders have well-defined expectations of me as an online educator. I will need my school or district leaders to be encouraging throughout the process of online teaching.	Disagree Somewhat Disagree, Somewhat Agree Agree
Online Teaching Professionalism		
18	I know how to locate resources that support my development as an online educator.	Disagree Somewhat Disagree, Somewhat Agree Agree
19	I know where to locate professional learning networks for online educators.	Disagree Somewhat Disagree, Somewhat Agree Agree
20	I know where to locate current research in the field of online teaching.	Disagree Somewhat Disagree, Somewhat Agree Agree

21	I can create a personal professional learning plan that includes resources for teaching online.	Disagree Somewhat Disagree, Somewhat Agree Agree
22	I know where to locate professional standards for online educators that support my developmentas a professional.	Disagree Somewhat Disagree, Somewhat Agree Agree
23	I can set personal professional learning goals that are directly applicable to teaching online.	Disagree Somewhat Disagree, Somewhat Agree Agree
Perceptions about Online Teaching and Learning		
24	I believe that students can learn effectively in an online environment.	Disagree Somewhat Disagree, Somewhat Agree Agree
25	I believe online learning is an effective form of instruction for students.	Disagree Somewhat Disagree, Somewhat Agree Agree
26	I believe that online learning is the best fit for some students.	Disagree Somewhat Disagree, Somewhat Agree Agree
27	I believe students' are motivated to learn in an online environment.	Disagree Somewhat Disagree, Somewhat Agree Agree
28	Online learning provides a positive learning environment for students.	Disagree Somewhat Disagree, Somewhat Agree Agree
29	I believe students can learn as effectively through online instruction as through face-to-face instruction.	Disagree Somewhat Disagree, Somewhat Agree Agree
30	I believe online instruction allows for meaningful interaction among students.	Disagree Somewhat Disagree, Somewhat Agree Agree
31	I believe online education has increased equity in education.	Disagree Somewhat Disagree, Somewhat Agree Agree