Are We Ready? Investigating Educators' Post-Pandemic Readiness for the Transition to Online Teaching

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Abstract— A study was conducted to investigate factors influencing educators' preparedness for transitioning to online teaching following the global pandemic. The analysis of data gathered from 281 teachers through a survey, which included demographic information, utilization of online tools, and their reflections on the transition to online teaching, aimed to identify the variables that affected their perceived readiness for potential online schooling. The findings revealed that high school teachers considered themselves more prepared compared to teachers at other school levels, while no significant differences in perceived readiness were observed across subject areas. Additionally, teachers' prior experience with online tools seemed to enhance their preparedness. The implications of these results for teachers are discussed in relation to potential future disruptions to traditional schooling.

Keywords— K-12 education, online teaching, readiness, educators

I. Introduction

The COVID-19 pandemic was an "acute case of cumulative risk" [1] that left an irreversible impact on human society. Since the breakout of the pandemic, there has been extensive research on efforts made to cope with the unprecedented catastrophe at the individual level [2], school level [3], government level [4], and global level [5]. Emergency Online Teaching (EOT) was predominant in the early 2020s when education was mostly improvised in many countries around the world [6]. The experience of EOT called for the need of professional development for online teaching, well-established Internet access over the country, and reinterpretation of the curriculum [7]. While there has been an improvement in the systematic support for teachers such as digital devices and access to online tool licenses [5], little is currently known about K-12 teachers' perception of their experience during online teaching in the pandemic era.

The modern society is changing in an unparalleled speed and entropy is constantly increasing, which may cause another unimaginable disaster that may compromise the social infrastructure including education. Many futurists, such as Jeremy Rifkin, expect even greater chaos with unpredictable natural disasters, diseases, and resource crisis to come up in the near future. To establish a better understanding of the impact on teachers' perspective of their readiness and provide a better transition to any potential online schooling, it is necessary to investigate what the experience with the pandemic meant to current teachers and what lessons we can learn. After all the transformation in educational policies, contents, means, and dynamics, are teachers ready for another transition to teaching online? Has the experience from the pandemic left some permanent impact on teachers' expertise and philosophy on teaching? Exploring teachers' readiness for potential online schooling will help stakeholders design better professional development and teaching environment for teachers, which leads to a more adaptive and nimble public education system. Thus, the following research questions are addressed in this paper:

Research Question 1: Do teachers' years of experience, prior experience with online tools, and change in teaching practice affect their perceived readiness for transitioning to online teaching?

Research Question 2: To what extent does the perceived readiness for transitioning to online teaching vary based on school level and subject areas?

II. Method

To provide answers for the research questions, an online survey distributed via social media for four days from February 27th to March 2nd, 2023. It consists of three parts in 5-point Likert scale (1) Demographics (age, gender, years of teaching experience, subject area of teaching), (2) Use of online tools (online tools they use for teaching and lesson planning, purpose of using online tools), (3) Reflection (self-reports on how much they feel their teaching style has changed, they depend on online tools when teaching and lesson planning, and they are ready for another potential online switching). A total of 324 anonymous responses were collected and cleaned. Responses from duplicate IP addresses and responses having inadequate response time (less than 30 seconds)

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were removed for better validity. As a result, 281 responses were used for a linear regression analysis to figure out the variables that correlate with teacher ¶ perceived readiness for potential online schooling.

III. Result

A linear regression analysis is conducted to answer the posed research questions. For a sound linear regression analysis, the assumptions of normality and homoscedasticity about residuals should be met [8], which means, the residuals are normally distributed with a mean of 0 and they have a constant variance at each X value. This is checked with Figs. 1 and 2, respectively. The 5-point Likert scale used in this survey assumes an equal distance between each option, which allows the analysis to treat the variable as continuous [9].

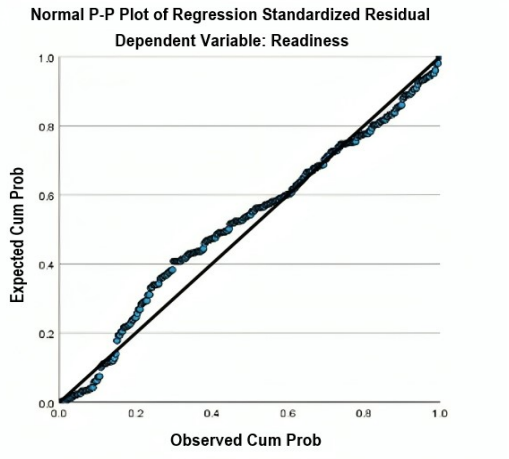

Fig. 1. Normal P-P plot for homoscedasticity assumption check.

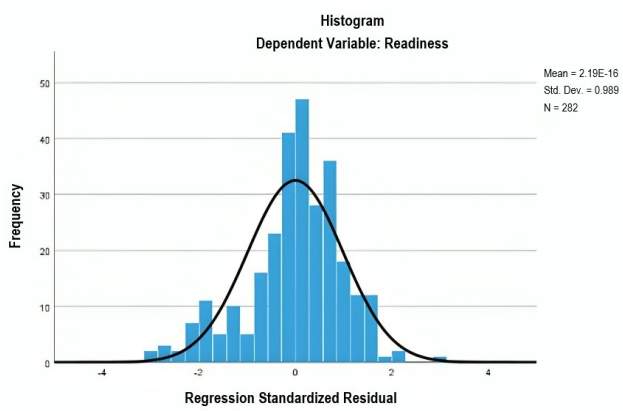

Fig. 2. Histogram of standardized residuals for normality assumption check.

Green [10] suggested the sample size for individual slope tests should be equal to or greater than 104 + the number of predictors, which is 107 in this case. With stricter standard suggested by Maxwell [11], a sample size of 218 is suggested for three predictors. As we have 281 responses, it is concluded to be safe to run the analysis with the current dataset.

For the first research question, an overall slope test was run to see if any of the three predictors are statistically significant and if there is a multicollinearity issue (see Table I). The omnibus F test was statistically significant ($F(3, 278) = 70.685$, $p < 0.001$), which means at least one of the three predictors has some predictive power for the perceived readiness. Then Tolerance and VIF were checked to detect multicollinearity.

TABLE I. Collinearity Statistics for the Three Predictors

Independent Variable	Tolerance	VIF
Change of Teaching Style (StyleCh)	0.881	1.136
Use of Online Tools (Onlineuse)	0.882	1.134
Years of Experience (YearofEx)	0.998	1.002

A multicollinearity is usually detected when the tolerance is less than 0.333 and VIF is greater than 3. In this case, all variables show tolerance higher than 0.881, which means only 11.9% of variance in *StyleCh* is explained by other predictors at most. Thus, all predictors in the model can be independent from one another. Next, a linear regression analysis was run independently for each variable: years of experience (*YearofEx*), online tool using experience (*Onlineuse*), and the change of teaching practice (*StyleCh*). The results are shown in Table II.

TABLE II. Model Summary for YearofEx, Onlineuse, and StyleCh

	YearofEx	*Onlineuse*	*StyleCh*
R	0.108	0.390	0.631
R Square	0.123	0.152	0.398
Adj. R Square	0.008	0.149	0.396
Std. Error	1.337	1.239	1.044
R Square Change	0.012	0.152	0.398
F Change	3.306	50.267	184.987
df1	1	1	1
df2	280	280	280
Sig. F Change	0.070	< 0.001	< 0.001

Note: *Readiness* is the dependent variable.

Based on the results, the change of teaching practice was the strongest predictor for teachers ¶ perceived readiness ($F(1, 280) = 184.987$, $p < 0.001$). The second strongest predictor was the online tool using experience ($F(1, 280) = 50.267$, $p < 0.001$). Years of experience did not have a statistically significant predictive power for the perceived readiness for a potential online schooling ($F(1. 280) = 3.306$, $p = 0.070$) at the alpha level of 0.05.

For the second research question, we investigated the effect of school level and subject area on teachers ¶ perceived readiness. We ran a linear regression analysis with two dummy variables and *Readiness* as a dependent variable. The reference group was high school. As shown in Table III, high school teachers reported to have a statistically significant high *Readiness* compared to teachers in other school levels.

TABLE III. Parameter Estimates of School Level on Perceived Readiness

Parameter	B	Std. Error	t	Sig.
High school	4.182	0.103	40.492	< 0.001
Middle school	í1.291	0.209	í6.165	< 0.001
Elementary school	í0.924	0.165	í5.615	< 0.001

Next, the effect of the subject area on teachers ¶ perceived readiness was tested with six dummy variables. The subjects included English (n = 65), mathematics (n = 79), science (n = 59), social science (n = 44), physical education (n = 44), second language (n = 22), and others (n = 5). The reference group was English. The results are shown in Table IV.

TABLE IV. PARAMETER ESTIMATES OF SUBJECT AREAS ON PERCEIVED READINESS

Parameter	B	Std. Error	t	Sig.
English	2.000	1.342	1.490	0.137
Mathematics	1.472	1.352	1.089	0.277
Science	1.734	1.351	1.284	0.200
Social science	1.678	1.354	1.239	0.216
Physical education	1.727	1.358	1.272	0.204
Second language	2.091	1.373	1.523	0.129
Others	1.200	1.471	0.816	0.415

According to the result, subject areas did not have statistically significant predictive power on teachers ¶ perceived readiness for potential online schooling.

IV. DISCUSSION

At the onset of the global pandemic, approximately 30% of schools worldwide were compelled to close solely due to its impact. This unprecedented situation led to various consequential effects, including mental health concerns [12], learning disparities [13], and feelings of isolation [14]. Recognizing the need to avoid such circumstances in the future, online schooling has transitioned from being an alternative to becoming an indispensable complement to traditional educational practices, necessitating preparedness among all teachers.

This study aimed to delve into the intricate web of factors that shape educators ¶ preparedness for the challenges of online education. It sought to understand the diverse experiences and perspectives of teachers who navigated the uncharted waters of remote teaching during the pandemic. By doing so, we hope to shed light on the crucial aspects of training, infrastructure, and support systems that contribute to educators feeling equipped to tackle the ever-evolving landscape of education.

The findings revealed a significant relationship between teachers ¶prior experience with online tools and their perceived readiness for transitioning to online schooling. Furthermore, teachers who actively engaged with various online tools to enhance their virtual teaching reported a higher level of preparedness. These outcomes suggest that factors such as mindset and efficacy among teachers warrant further investigation in relation to their perceived readiness for online instruction.

The study also found that those teachers who had experience trying different teaching styles such as moving from lecture-based to project-based felt more prepared. Perhaps the nature of online teaching is more student-centered [15], therefore, teachers were more able to transition to a different mode of teaching more easily. Also, due to certain limitations of online settings, such as not being able to physically interact with others, may have forced some teachers to seek a new way of teaching. For example, if a math teacher mainly used worksheets to help students practice certain concepts in the past, he or she had to find an alternative for the worksheets during the pandemic, which naturally led them to use online tools and open-source websites. As this paper shows a correlation between the use of online tools and perceived readiness for online teaching, it adds an emphasis on helping teachers with professional development by using online tools or supporting systems such as certification or licensure for online tools and resources. For instance, the public school system may purchase institutional access to certain prevalent online tools or develop one tailored to teachers ¶needs.

The findings from our study not only underscored the variations in teacher preparedness across different school levels but also offered valuable insights into the potential factors behind these differences. Interestingly, the data revealed that secondary teachers emerged as the most prepared among the three school level groups that were studied. This intriguing observation suggests a convergence of factors that may contribute to this phenomenon.

One possible explanation could be the developmental stage of the students themselves. Adolescents at the secondary level may be at a stage where they are better equipped to self-regulate their learning and take on greater responsibility for their schoolwork. This maturity might allow teachers to place more trust in their students to engage with the curriculum independently, which, in turn, could lead to a higher level of preparedness among secondary educators.

In contrast, elementary and middle school students typically rely more heavily on teacher-directed lessons. Elementary education, in particular, carries additional responsibilities beyond purely academic instruction. Elementary schools play a crucial role in shaping young minds and nurturing holistic development. This includes establishing a sound daily routine, ensuring regular and healthy meals, and facilitating the development of essential social skills through interactions with peers [16]. These multifaceted duties can demand more direct teacher involvement and potentially reduce the time and resources available for preparing exclusively for remote or online instruction.

Therefore, the relatively lower level of readiness observed among elementary school teachers might be attributed, at least in part, to the multifaceted nature of their roles. It ¶ not merely about imparting academic knowledge but also about creating a nurturing and supportive environment that addresses the overall well-being and development of young children. This dual role may have limited their capacity to pivot seamlessly into remote teaching during the study period.

Understanding these nuances in teacher preparedness across different school levels provides an opportunity for educators, policymakers, and researchers to tailor support systems and professional development initiatives accordingly. By acknowledging the unique challenges faced by elementary educators and recognizing the potential for increased self-regulation among older

students, we can better equip our education system to respond effectively to future disruptions, ensuring that all students receive the best possible learning experiences, regardless of their age or grade level.

Results from survey analysis indicated little difference between subjects, which was not statistically significant. However, some subjects that involve more physical interaction, such as physical education or science, may have had extra trouble delivering an online lesson [17]. More research can be done on these subjects.

V. Conclusion

This study provides important insights into the factors influencing teachers ¶readiness for transitioning to online schooling in the context of the global pandemic. The findings highlight the significance of teachers ¶ prior experience with online tools and their openness to adopting diverse teaching approaches. The results also suggest the need for comprehensive support and professional development opportunities to enhance teachers ¶ proficiency in utilizing online resources effectively.

In a world where uncertainty prevails, this research endeavor carries the promise of informing policy decisions, teacher training programs, and institutional strategies, ultimately working towards a more resilient and adaptable educational system. As we stand on the precipice of an uncertain future, the insights gleaned from this study may serve as a beacon, guiding educators and policymakers alike towards a more prepared and agile approach to education, ready to face whatever challenges lie ahead.

Conflict of Interest

The authors declare no conflict of interest.

Author Contributions

Chaewon Kim conceptualized the research idea, designed the method, collected and analyzed the data, and wrote the original draft; Dave Pratt reviewed and edited the original draft for clarification; both authors had approved the final version.

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