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Preparing Teacher Candidates for the Post-Pandemic Classroom: Insights through a transformative learning perspective

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Abstract

This study examines the effects of hybrid teaching on K-12 student learning during and after the COVID-19 pandemic, as perceived by Florida's preservice teachers (PSTs). We conducted two mixed-method studies in fall 2020 and 2022, exploring how PSTs' views on teaching and learning evolved in these new post-pandemic learning environments. Using transformative learning theory as our foundation, we analyzed PSTs' experiences as they navigated this shift in education. Initially, PSTs reported concerns about student isolation and focus on hybrid settings. Later, they noted persistent challenges with engagement and academic performance, alongside improved student technology skills. Our findings highlight the need for adaptive teacher preparation programs that address these emerging classroom realities. We propose strategies for enhancing PST training, emphasizing remediation, classroom management, and technology integration. By reflecting on our own transformative education journey alongside our students, we aim to contribute to more resilient and innovative teaching practices. This research offers insights into the enduring impact of the pandemic on education and informs sustainable approaches in teacher preparation for evolving learning environments.

Keywords: Transformative Learning, Post-Pandemic, Learning Environments, Transformative Education

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Introduction

The pandemic has had a multifaceted impact on both K-12 and higher education. While we cannot yet fully understand the lasting implications the pandemic will have within the field of education, research indicates that hybrid modalities impacted the landscape of our educational communities (Goldberg, 2021). According to the United Nations (2020), school closures due to the pandemic affected 1.6 billion learners from 190 countries, or 94% of the world's student population. In the fall of 2022, the Institute of Education Sciences, a division of the United States National Center for Education Statistics released the first set of findings of the Nation's Report Card since the inception of the pandemic. The report showed the first declines in reading and math scores after the pandemic across the United States, with the largest score drops amongst lower-performing students (United States Department of Education, 2022). These findings corroborated concerns outlined in 2021 by the United States Department of Education in a report titled *Education in a Pandemic,* which stated that

> the educational gaps that existed before the pandemic—in access, opportunities, achievement, and outcomes—are widening... [which] and can be a cause for great concern, especially when they interfere with a student's opportunity to learn, grow, and contribute to our nation's future. (United States Department of Education, 2021, p. ii)

Further, the *Education in a Pandemic* report also stated some startling facts: in May 2020, only 15% of elementary school districts in the United States "expected their elementary students to be receiving instruction for more than four hours per day during remote learning" and 17% reported that instruction in spring of 2020 was "designed not to teach new skills and understanding, but to review what had already been taught—in a sort of pandemic holding pattern" (United States Department of Education, 2021, p.2).

However, these problems were not isolated to the 2019-2020 school year, rather, they persisted throughout much of the following school year as well. Additional reports on the impact of the pandemic on student learning indicated that although 67% of adult respondents who had children enrolled in public and private schools in the United States relayed that their students' classes had shifted to a distance learning format at the beginning of the 2020-2021 school year, only 59% reported that the school districts provided computers and internet access to students engaged in distance learning (Irwin et.al, 2021). A whitepaper from the McKinsey group found that worldwide access to high caliber hybrid learning differed "across and within countries" which led students globally to be an average of eight months behind where they would have been had the pandemic not occurred (Bryant, 2022). These outcomes are in direct opposition to the United Nation's Sustainability Development Goals (United Nations Statistics Division, 2023) which recently updated sustainability efforts in education to "ensure inclusive and equitable quality education" via indicators such as access, quality, and increased proficiency in literacy and math. Students in higher education also struggled to find equitable access to technology during the pandemic and reported lower academic performance (Faura-Martínez et al., 2022); seemed to be less engaged in their studies and had insufficient social support from classmates and instructors during the pandemic (Cifuentes-Faura et al., 2021); and reported learning less and rated their learning during the pandemic as fair or poor (Ezarik, 2021).

This manuscript relays the findings of two mixed-method phenomenological research studies that explored the impact of the hybrid teaching model and perceived K-12 student learning amongst preservice teachers (PSTs) within the state of Florida. According to US News and World Report (n.d.), Florida ranks sixteenth in the nation for their public K-12 scores, yet they came in first place for higher education offerings rounding out to an overall score of third place across the United States. In this manuscript, our aim was to investigate the difference in educational offerings cited in United Nations sustainability reports through the lens of preservice teachers (PSTs) enrolled in a teacher preparation program during two distinct time frames: fall 2020 and fall 2022. Additionally, we will provide valuable suggestions and considerations for higher education faculty involved in teaching preservice education programs.

Utilizing Mezirow's (1991/2009) phases of Transformative Learning as the theoretical framework, findings suggest implications in sustainability practices in teaching and learning were evident. Transformative Learning posits that learners will reconsider their beliefs when adjusting to a new experience, such as the initial shift to hybrid modalities and continued remediation efforts. Specifically, we were interested in exploring the continued instructional implications of teaching and learning within the K-12 post-pandemic classroom. Study 1 (2020) was designed to address the initial phases of Mezirow's Transformative Learning, where learners often find themselves in a process of reconsidering beliefs as they adjust to a significant situation, such as the initial shift to hybrid modalities many experienced during the pandemic. This adjustment often leads to transformation, and we sought to explore some of the issues surrounding the cognitive dissonance/transformation aligned to hybrid learning in our teacher preparation program. Study 2 (2022) sought to expand our initial insights and explore Mezirow's later stages (1991/2009) where learners are actively aware of their transformation as they investigate their new roles and obtain the understanding and expertise necessary to plan new courses of action. Our reflections suggest higher education faculty should be involved in a dynamic process of transformation alongside our students to ensure sustainability efforts in teaching and learning. This continued work is

critical to the United Nations Development Programme's (UNDP) goal of ensuring equitable education by increasing the "supply of qualified teachers." If we are to improve the sustainability of education for all, one important indicator is high-quality intentional teacher training.

Literature Review

During the pandemic, preservice teachers reconsidered their beliefs regarding teaching and learning as they adjusted to the new experience of hybrid teaching. Post-pandemic, preservice teachers reported on what they are currently experiencing in the classrooms based on perceived notions of previous hybrid instruction. Mezirow's Transformative Learning Theory (TLT) (1978) was utilized to undergird our analysis of the data.

Transformative Learning Theory

Jack Mezirow's Transformative Learning Theory was used as the theoretical framework for these studies. TLT was first conceptualized in 1978 and has undergone several reiterations, culminating with Mezirow's own 2009 overview, which we utilized in this study. According to Mezirow (2009),

> Transformations may be epochal—sudden major reorientations in habit of mind, often associated with significant life crises—or cumulative, a progressive sequence of insights resulting in changes in point of view and leading to a transformation in habit of mind.

As such, TLT is especially salient to this study as we explored teaching in a time of great upheaval, such as the sudden shift in teaching and learning experienced during the pandemic, but also during post-pandemic teaching where change is still ongoing.

Mezirow (2009) holds that TLT is a theory connected to examining one's identity and that the process is metacognitive. There are ten phases to TLT, however, in this manuscript, we focused on the first seven phases of transformation: a disorientation dilemma, self-examination, critical assessment of assumptions, recognition of transformation, exploration of options, planning a course of action, and acquisition of knowledge and skills (Mezirow, 2009). According to the theory, learning begins with an experience that leads to a "disorienting dilemma." We theorise that the abrupt shift to hybrid teaching was one such disorienting dilemma experienced by our participants that catapulted them into an epochal transformation (Phase 1). As they reconsidered their beliefs as they adjusted to these new experiences and dilemmas, a process of self-examination (Phase 2) and a critical assessment of assumptions (Phase 3) was underway. Our initial study saw evidence of Phases 1-3, whereas it was not until the second study that we saw evidence of more advanced stages of transformative learning emerge from Phases 4- 7 (see Figure 1).

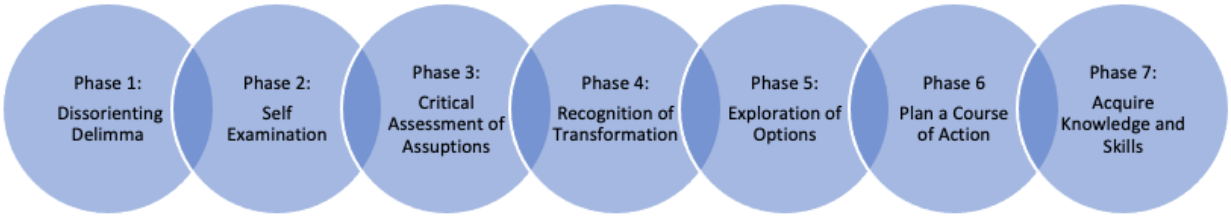

Figure 1. Mezirow's Phases of Development (2009)

Hybrid Learning

Hybrid learning is an educational model that incorporates technological tools and online elements to facilitate learning in place of traditional in-person instruction (Singh et al., 2021). When the pandemic emerged, schools faced the need to reimagine their teaching methods, and hybrid learning quickly became a popular choice. Its appeal was attributed to the flexibility it offered in terms of time, space, and pace of learning, especially during such unprecedented times (Xiao et al., 2020, p. 1204). However, the abrupt transition to hybrid learning posed challenges. Schools had little time for well-planned instructional design due to the immediate nature of the pandemic's impact (Hodges et al., 2020). The shift was chaotic, lacking in professional development and comprehensive curriculum maps (Ali, 2020; Howard et al., 2021). Many school districts adopted hybrid models uncertain of how long they would be necessary. In our study, we utilized a Likert scale with five metrics, including Strongly Agree, Agree, Undecided, Disagree, and Strongly Disagree, to assess preservice teachers' perceptions of hybrid teaching modalities on K-12 student learning during and after the pandemic. The Likert scale was accompanied by constructed responses to provide additional context for the scale ratings. Nevertheless, this widespread adoption highlighted critical areas for educational improvement. One significant issue that surfaced is the need for equitable access to education for all K-12 students (American Association of School Administrators, 2020; American Academy of Pediatrics, 2020; Darling Hammond, 2020; United Nations, 2023). Equitable access is a foundational tenet outlined by the UDNP (United Nations, 2023), crucial for achieving sustainability in education and providing lifelong learning opportunities for everyone.

Teaching and Learning Disorientation

The COVID-19 Pandemic caused schools to close, restructuring teaching and learning platforms to online or hybrid formats. Abruptly shifting these reinvented learning spaces challenged the norm for conventional education settings. Millions of students experienced an interruption in learning from absenteeism, decreased learning times, and lack of technology, teacher training, and support (Anderson, 2020). Teachers are confronted with a disorienting dilemma; as a result of the sudden transfer of developing new spaces for teaching and learning, their experiences may not fit into current beliefs, values, assumptions, or practices of teaching and learning experienced during the onset of the Pandemic (Mezirow, 2009).

One of the groups uniquely impacted by this disorientation was preservice teacher candidates. At a time when they were still learning about how to teach in traditional schools, they too were catapulted into chaos. Yet, in contrast to in-service teachers, these preservice teachers were still trying to figure out what it meant to be a teacher in K-12 schools. Furthermore, Buschelman (2020) explored the unique experience that preservice teacher candidates faced post-pandemic, offering that field-based experiences were both tumultuous yet offered "the opportunity for great growth" (p. 146). In this vein, Garcia and Weiss (2020) note the "emergency remote teaching" implementation hindered teacher professional development. The systematic and routine exploration of instructional routines during this time has yet to be determined. Furthermore, the quality and methods of teaching may also give rise to largely unexplored questions connected to teacher preparation and training during the pandemic impacting plans on the development of comprehensive strategies to support contingency planning. Therefore, the research on what alternative instructional methods and modes work and how these structures align with our teaching beliefs and practices are highly encouraged to inform the field of education. The necessity for recovery during this time should begin to explore new or reimagined learning modes that can reach all students while promoting a system of resiliency (Azz-Huck, & Shmis, 2020). Further, to help teacher candidates move beyond "crisis management" towards transformation and sustained professional growth, continued reflection was found to be a crucial factor (Burn et al., 2022). Reflection is an embedded component in Mezirow's TLT; reflection is necessary and aids individuals as they experience a shift in their thinking once they encounter a "disorienting dilemma" and move towards transformation (Mezirow, 1991/2009).

Method

In this manuscript, we examined the results of two distinct mixed-method phenomenological research (MMPR) studies exploring the impact of hybrid teaching model and perceived K-12 student learning amongst preservice teachers (PSTs) within the state of Florida. We define the hybrid learning model as the choice for students to attend in person by physically being present on the school campus, while others have the alternative to participate remotely through virtual platforms such as Zoom, Microsoft Teams, or Google Meet in a synchronous fashion. In K-12 settings, hybrid learning provided students and their families the flexibility to decide whether to attend classes in person or engage remotely, according to their preferences and circumstances during the pandemic. Additionally, it presented teachers with the opportunity to blend traditional face-to-face teaching methods with digital tools to enhance student learning. Our research had a limited sample size, making generalization challenging. However, the data we collected from hybrid learning provided valuable insight into the disparity in educational offerings mentioned in United Nations sustainability reports.

We focused on data from preservice teacher candidates (n=45 in 2020, n=13 in 2022) at two time points: fall 2020 (study 1) and fall 2022 (study 2). In 2020, we distributed the survey to all current students in our educational program, and we followed up with the same sample in 2022. The response rate for the follow-up survey was lower, mainly due to some students having graduated from the program and attrition. In both study 1 and study 2, we developed research questions that explored how preservice teachers described the perceived influence of hybrid teaching modalities on K-12 student learning during and post-pandemic. The survey was sent to all education students at our university's educational centers in the Central, West Central, North Central, and North-eastern regions of Florida. In study 1, the survey included five metrics using a Likert scale, with constructed responses providing additional context for the scale ratings (ranging from Strongly Agree to Strongly Disagree). In study 2, we solely used constructed responses to gain insight into the impact of previous hybrid instruction during the pandemic on teaching and learning in post-pandemic classrooms. These results provided a better understanding of the pandemic's impact on student learning from the perspective of preservice teachers, offering a more holistic view of its perceived implications.

The amalgamated data from our findings in study 1 allowed us to highlight and address issues surrounding the “disorienting dilemma” of hybrid teaching through the theoretical frame of Transformative Learning (Mezirow, 1991/2009). The increase in demand for hybrid teaching models and the relative stressors caused by such striking changes and demands to conventional teaching methods led our participants to self-examine their beliefs on teaching and learning to critically assess their previously held assumptions. Our findings from study 2 assisted in providing insight as to the impact of the pandemic in current classrooms and the new roles, target areas in promoting change, and reflection on supports need to actively situate the changes necessary for the post-pandemic classroom. Since the onset of the pandemic, our educational institutions have faced and continue to face changes that have challenged some of the most conventional theories and practices governing almost every aspect of educational delivery.

This two-stage study examined this initial period in which preservice teacher candidates reconsidered their beliefs by first understanding some of the issues surrounding the cognitive dissonance aligned to the hybrid learning shift. This study also aimed to provide an understanding of hybrid learning pedagogy, perceived impact on student populations, and teaching and learning from the lens of preservice teachers. By reporting on this transformation, we can begin to understand the impact of the pandemic on teaching and learning and how to better support our PSTs in this time of recovery.

Research Design

We explored the shared phenomenon as an approach to describe the transformative learning experience that preservice teachers shared as they traversed the impact of hybrid learning both during and post-pandemic. This research sought to explore the ‘shared experiences and understandings of educational professionals as they navigated the new experience of hybrid learning (Ezzy, 2002). Using an MMPR

approach aided in highlighting the participants' unique and "subjective experiences" (Bogdan & Biklen, 2003) by capturing those transformative moments within teaching and learning. Using a phenomenological lens aided us as we sought to understand and accurately analyse the shared experience that was being described regarding cognitive dissonance and disorientation to assist with our understanding of this transformative learning experience. We followed the definition of the mixed method research offered by Tashakkori and Teddlie (1998) where data, findings, and inferences are informed by both the qualitative and quantitative data collected, enabling us "to obtain different but complementary data on the same topic" (Morse, 1991, p. 122). Similarly, Creswell and Plano Clark's (2006) mixed methods triangulation method models propose the researchers "collect and analyse qualitative and quantitatively data separately on the same phenomenon and then different results are converged by comparing and contrasting the different results during the interpretation" (p. 64). Mayoh and Onwuegbuzie (2015) provide a conceptualization for using MMPR in practice when looking for "one method to inform another" because "the strength of quantitative research (identifying common aspects of a phenomenon) is used within a phenomenological framework to provide orientation and focus to a study where the phenomenological method is dominant" (p. 99). The use of the MMPR lens was specifically helpful in our design because we wanted to both understand the lived experience of any perceived 'disorientating dilemmas 'perceived by our participants and use these to develop an intervention in the latter application of our findings. The MMPR lens allowed us to honor the first-person lived experience "on its own terms" while infusing quantitative data to capture the perceived influence upon student learning.

Results

Likert Scale – Study 1

In study 1, Survey Questions (SQ) 1 and 3, PSTs were asked to rate their response utilizing a 5-point Likert scale. The responses ranged from (1) Strongly Agree; (2) Agree; (3) Undecided; (4) Disagree; (5) Strongly Disagree. Utilizing simple descriptive statistics, these ratings from *Strongly Agree* to *Strongly Disagree* for each SQ are presented below.

SQ 1. Hybrid teaching modalities have negatively impacted K-5 student learning during the 2020 school year.

Overall, the sample indicates that 65% of PSTs surveyed agree that hybrid teaching has had a negative impact on teaching, with 25% rating their response as *Strongly Agree.* The category of preservice teachers rating their response as *Undecided* was 22% indicating that there may be a positive or negative impact, but neither was obvious during classroom instruction. Within the *Disagree* category, 13% of PSTs felt there were no negative impacts within classroom instruction observed during the school year, with a 0% rating in the category of *Strongly Disagree* (see Figure 2).

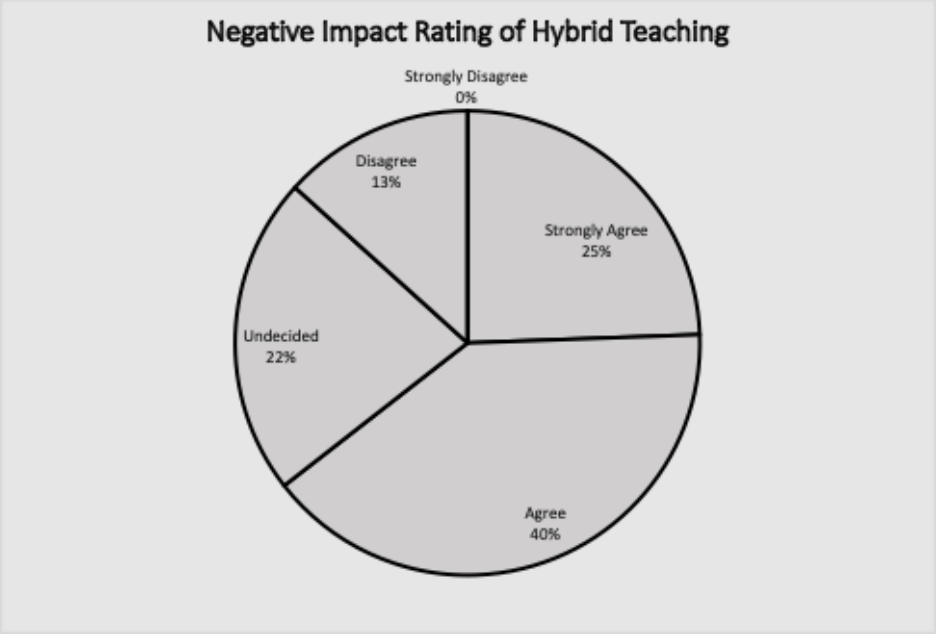

Figure 2. Negative Impact Rating of Hybrid Teaching

SQ 3. Hybrid teaching modalities have positively impacted K-12 student learning during the 2020 school year.

Overall, the sample indicates that 24% of PSTs surveyed agree that hybrid teaching has had a positive impact on teaching, with 2% rating their response as *Strongly Agree.* The category of preservice teachers rating their response as *Undecided* was 36% indicating that there may be a positive or negative impact, but neither was obvious during classroom instruction. Within the *Disagree* category, 40% of PSTs felt there were no positive impacts within classroom instruction observed during the school year, with 16% rating their response as *Strongly Disagree*. To provide a deeper understanding of the rating for Question 3, PSTs were asked to provide a constructed response statement to justify their response (see Figure 3).

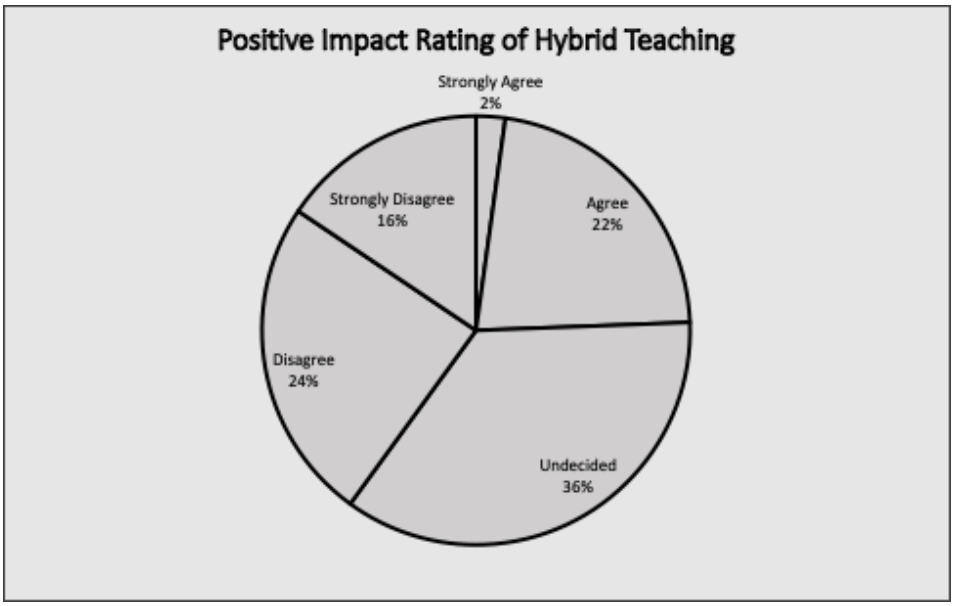

Figure 3. Positive Impact Rating of Hybrid Teaching

Constructed Responses – Study 1 and Study 2

Data collected from study 1 provided the PSTs with the opportunity to *explain* their ratings in the form of constructed responses for the Likert Scale questions above. The constructed responses in study 1 provided insight into the Likert scale ratings qualitatively. Additionally, in Study 2, constructed responses were utilized solely to provide insight gleaned from previous hybrid instruction during the pandemic and the impact on teaching and learning in the post-pandemic classroom. In Study 2 an additional question was asked in the form of a "follow-up" question to provide a clear understanding of PSTs' decision-making processes corresponding to their responses. To support each themed category, we selected participant responses that captured each themed category by the highest number of references when coded. The analysis of the data provided from the constructed responses into SQ 2 in study 1 and study 2 assisted in the development of themed categories for analysis during the coding process. Each theme was then quantified by the number of times identified within each PSTs' response.

In study 1, the largest percentage of Likert Scale responses aligned to *Strongly Agree and Agree. T*he emergence of themed categories, from the constructed responses aligned to, *Social Emotional/Group work, Distractions, Focus, and Home Environment and Non-participatory/Non-active Roles/Motivation low* rated the highest number of references when coded in the sample responses. According to our participants, the shift to hybrid learning has negatively impacted student achievement in three main areas noted above. First, PST responses indicated that reduced in-person collaboration and group work minimized social-emotional development and peer engagement. Additionally, responses indicated that PSTs felt home environments often lacked necessary support systems and structure, which amplified student struggles with concentration and self-regulation. Finally, comments indicated that predominantly passive online instruction diminished student participation, hands-on practice, motivation, and retention. In these ways, hybrid models failed to facilitate interactive learning, classroom community, and relationship building. Students disengaged without sufficient prompting, participation, or guided support. By not adequately addressing these community, environmental, and methodological pitfalls, hybrid modalities seemed to hinder student learning across domains (see Table 1).

Table 1. Categorical Themes and Sample Responses for SQ2

Study 1 - SQ 2. *In what ways have hybrid teaching modalities negatively impacted student learning? Explain below:*
Categorical Themes
1. Social Emotional/Group work
2. Distractions/Focus/Home Environment
3. Non-participatory/Non-active Roles/Motivation low
PST Sample Responses
"Motivation seems to dissipate when being online. It leads to easy distractions, ultimately making learning difficult." *"Students do not have the concentration skills to learn everything on their own.*" *"Children at home often do not have support systems in place to assist them through their school day. If caretakers are not able to keep them on track, some students are unable to regulate their day appropriately."* *"The student-teacher, student-student interaction is minimal."* *"Strategies that work in person do not necessarily work online, and vice versa."*

In study 2 the themed categories from the constructed responses aligned to, *Lack of Focus/Engagement, Lower Level/Lack of Learning, and Low Social Skills* rated the highest number of references when coded. In Study 2, a supplementary question was introduced to gain further understanding of PST perceptions regarding the link between hybrid teaching methods and perceived adverse effects on student learning (SQ 2). This question aimed to explore instructional decisions made

by PSTs, aligning with the insights provided by them. These constructed responses were directly connected to the reporting of what the PSTs had done *differently* to support the negative impacts on teaching and learning after the pandemic. The themed categories, *Lack of focus/Engagement, Low Level/Lack of Learning and Low Social Skills* remerged as the ones with the highest number of references during coding.

Teacher candidates reported observing significant negative impacts on student learning stemming from previous hybrid model instruction. Most notably, PSTs reported that students demonstrated a pervasive lack of focus and short-term engagement in lessons. As a result, veteran teachers often resorted to only instructing small groups, providing minimal retention in whole-class settings. Academically, PSTs noted that students appeared and tested behind grade level across subject areas. Socially, diminished interpersonal skills hinder teamwork and peer relationships. Students required substantial prompting to start assignments, displaying reduced attention spans, intrinsic motivation, and persistence. In these responses, PSTs perceptions indicated that the residual effects of passive hybrid learning continued handicapping student achievement, participation, collaboration, and socioemotional growth. Addressing these engagement and skill deficits remains imperative for teacher candidates moving forward (see Table 2).

Table 2. Study 2 Categorical Themes and Sample Responses for SQ2

Study 2 - SQ 2. *In what ways do you perceive that previous hybrid teaching modalities **negatively** impacted student learning based on what you are seeing in your placement (e.g., CT discussions, student observations)? Explain below:*
Categorical Themes
1. Lack of focus/Engagement
2. Low Level/Lack of Learning
3. Low Social Skills
PST Sample Responses
"I am seeing a large lack of focus and short-term engagement for students across grade levels. My CT, who is a veteran teacher, will only teach to small groups in rotations due to the lack of learning that seems to be received by students in a whole group setting." *"The social skills of students seem very low which negatively impacts their personal relationships and teamwork. Academically, several students appear, and often test, one to two grade levels below."* *"Students are reluctant and slow to start on writing assignments. They also struggle with engagement and motivation to get started. I think from using hybrid teaching, students developed a shorter attention span and have less intrinsic motivation."*

In the following table, we presented insights derived from participants in Study 2 through constructed responses. These insights delved into their experiences with hybrid instruction during the pandemic and its implications for teaching and learning in the post-pandemic classroom. Additionally, we explored PSTs' decision-making processes through a follow-up question, which asked them what they have done differently in response to these insights. The participant responses highlighted in the table represented various thematic categories, selected based on their frequency during coding. The themed categories, *Remediation, Engagement/Classroom Management and Cooperative Learning/Peer Discussions* emerged with the highest number of references during coding.

Teacher candidates indicated making several instructional shifts based on observing the lingering impacts of hybrid learning. They often remediated by teaching content below grade level across the board to account for noted deficits. Additionally, PSTs noted that creative engagement strategies helped reactivate student focus, participation, and enjoyment in lessons. Candidates also prioritize cooperative structures like peer discussions to rebuild collaboration and interpersonal skills. However, based on PST

responses classroom management remained challenging amidst these efforts. Despite candidates tailoring remediation, activities, and groupwork to support students, undoing the effects of passive hybrid learning persisted as an uphill battle. Teacher preparation programs must continue emphasizing engagement and relationship-building strategies to equip future educators for these realities (see Table 3).

Table 3. Study 2 Follow-up Question Categorical Themes for SQ2

Study 2 – Follow-up Question SQ 2. What have you done differently because of these insights in your teaching? Explain below:
Categorical Themes
1. Remediation
2. Engagement/Classroom Management
3. Cooperative Learning/Peer Discussions
PST Sample Responses
"Yes, I find myself teaching more content based on lower grade ability to the whole class than I expected. Also, my CT has found classroom management implementation challenging so it tends to make it more difficult on me during my 8 hours a week. I feel like I spend as much time redirecting poor choices as I do teaching." *"I have been implementing creative practices into my lessons and the students are finding engagement once again; I think we need to do a little unwinding of the last three years."* *"Yes. Through my own course discussions as well as my own lesson plans, I have placed an extended emphasis on collaboration and peer discussion in the classroom to allow students the opportunity to practice these skills."*

An analysis of the data provided from the constructed responses for SQ 4 in study 1 and study 2 assisted in the development of themed categories for analysis during the coding process. Each theme was then quantified by the number of times identified within each PSTs' response. In study 1, the largest percentage of Likert Scale responses aligned to *Undecided.* The emergence of themed categories from the constructed responses aligned to, *Safety (due to pandemic), Learning Styles/Needs, and Social Emotional* rated the highest number of references when coded in the sample responses.

While predominantly negative, PSTs do identify some potential benefits of hybrid learning modalities. Primarily, keeping students home ensured safety amidst health concerns like the pandemic. Additionally, hybrid options allowed for more personalized learning tailored to unique styles and needs. For example, fully online formats better served students with anxiety who struggled socializing. However, PSTs overwhelmingly noted those advantages only applied to a small percentage of learners. Their responses indicated that they perceived that most students required in-person peer collaboration and teacher support to sufficiently progress. Therefore, while hybrid instruction may have provided some differentiation support, the majority of students seemingly depended on school community and structure for academic growth and socioemotional development (see Table 4).

Table 4. Study 1 Categorical Themes and Sample Responses for SQ4

Study 1 - SQ 4. *In what ways have hybrid teaching modalities positively impacted student learning? Explain below:*
Categorical Themes
1. Safety (due to pandemic)
2. Learning Styles/Needs
3. Social-Emotional

PST Sample Responses
It has been easier on some parents to keep their students home. Students are safe in their own home, and can get into a routine. *"There are clear benefits and draw backs, but it is going to be radically different for each student and their learning styles/needs."* *"There are some students who are able to handle the course load work entirely online and keep up with their grades, but I am only seeing a small percentage of students being able to do that. Another thing that I can't decide on is that impact this has with socialization for students who have anxiety this hybrid learning is a dream sent, but it is necessary for students to interact with each other, and they can only do so much via online."*

In study 2, the emergence of one themed category from the constructed response, *Technology* rated the highest number of references when coded. In study 2, a follow-up question provided additional insight to SQ 4 related to instructional decisions that supported the insights reported by PSTs. These constructed responses are directly connected to the reporting of what the PST has done *differently* to support the positive impacts in teaching and learning post-pandemic. The themed category, *Technology* emerged with the highest number of references during coding.

Despite broader challenges, teacher candidates noted one clear positive outcome of hybrid learning – increased student technology skills. Candidates observed learners efficiently navigating laptops, learning platforms, and digital tools independently. They highlighted how earlier hybrid instruction necessitated students developing self-sufficiency online to access materials and complete assignments. While technology cannot wholly replace in-person teaching, this fluency better prepares students for leveraging digital resources purposefully. Moving forward, teachers can build on this baseline to integrate technology in meaningful ways that enhance, rather than replace, hands-on learning. With guidance, students' tech-savviness provides promising foundations for more responsive blended instruction (see Table 5).

Table 5. Study 2 Categorical Themes and Sample Responses for SQ4

Study 2 - SQ 4. *In what ways do you perceive that previous hybrid teaching modalities* ***positively*** *impacted student learning based on what you are seeing in your placement (e.g., CT discussions, student observations)? Explain below:*
Categorical Themes
1. Technology
PST Sample Responses
"Students are well aware of technology and the era in which they are living. It is necessary to become fluent in using technology, however, there should be limits to these usages. I do see the positive of students knowing how to help themselves, especially should we need to move into remote learning again. Students know how and where to log in, and where to find assignments to complete." *"Students can navigate their laptops fairly well on their own. They also have an awareness of how technology can be used for learning."* *"Students are increasingly more prepared for technology usage in the classroom."*

In the following table, we present insights drawn from participants in Study 2 through their constructed responses. These insights shed light on their experiences with hybrid instruction during the pandemic and how it has influenced teaching and learning in the post-pandemic classroom. Additionally, we delved into the decision-making processes of preservice teachers with a follow-up question, prompting them to share any adjustments they have made in response to these insights. The participant responses

highlighted in the table encompass various thematic categories, selected based on their frequency during coding. The emergence of one themed category, *Technology* rated the highest number of references when coded.

Teacher candidates indicate leveraging students' strengthened technology skills by integrating digital tools more frequently in instruction. While using technology sparingly and purposefully, they created interactive Nearpod lessons and self-paced learning through educational programs. However, candidates balanced this with hands-on creative assignments to maintain engagement and comprehension. In this way, they built on the baseline tech fluency students developed through earlier hybrid model instruction, while still prioritizing tangible skills practice and relationship-building. As candidates prepared to lead their own future classrooms, these insights help shift perspectives on responsive educational technology integration to enhance, rather than replace, in-person learning (see Table 6).

Table 6. Study 2 Follow-up Question Categorical Themes for SQ 4

Study 2 – Follow-up Question SQ 4. What have you done differently because of these insights in your teaching? Explain below:
Categorical Themes
1. Technology
PST Sample Responses
"I have implemented both hands-on creative assignments into my teaching, along with creating my own Nearpod assignments with formative assessments that integrate the technology through a Time to Climb quiz. I find the right content for the correct implementation, and instead of using it for every lesson, I would use it sparingly." *"I ended up incorporating that tech piece more often than I thought I would when coming into the program."* *"Increased use of technology."* *"Incorporated more technology in my lessons."*

Discussion

The onset of the pandemic and the abrupt shift to hybrid learning models have had a lasting impact on our nation's schools. Mezirow's (1991/2009) Transformative Learning Theory holds that as adults adjust to new experiences, they will reconsider their beliefs. The present two-stage study examined the beginning phases of reconsidering beliefs about how students learn exhibited by our preservice teacher participants as they were first understanding some of the issues surrounding the cognitive dissonance aligned to hybrid learning. The analysis of both qualitative and quantitative data assisted in uncovering PSTs' previous experiences during the pandemic and current assumptions post-pandemic related to teaching and learning in the hybrid environment. This was important to understand so we could better assist with any pedagogical shifts that needed to occur in the classroom to support post-pandemic teaching and learning. Within the first study, we saw evidence of the first three phases of Mezirow's TLT phases 1-3, initial disorienting dilemma, self-evaluation, and critical assessment of assumptions. Our second study provided us with evidence of phases 4-6 of Mezirow's TLT: recognition of transformation, exploration of options, plan a course of action, and acquiring knowledge and skills. A cross-analysis of PST comments aligned to Mezirow's initial seven phases assist in exploring elements of critical reflection to provide insight for support in educational program preparatory courses aligned to the needs of PSTs to serve our K-12 learners (see Table 7).

Table 7. Transformative Learning phases and sample responses (adapted from Beer 2019)

Mezirow's Phases of Development	Description of Phase	Comments Aligned to Phase
Phase 1: Disorienting Dilemma	An experience that does not fit with one's expectations. A resolution happens when the person changes their view of the world.	*"Strategies that work in person do not necessarily work online, and vice versa."* *Another thing that I can't decide on is that impact this has with socialization for students who have anxiety this hybrid learning is a dream sent, but it is necessary for students to interact with each other, and they can only do so much via online.*
Phase 2: Self Evaluation	Reflection of one's feelings about the dilemma (usually feelings of shame or guilt).	*I feel the social/emotional impact this pandemic has had on students has been immeasurable. I think hybrid learning modalities were implemented with the hope of maintaining a sense of normalcy for students while also attempting to provide the highest possible level of education from the safety and comfort of their homes.* *I feel that there are benefits to hybrid teaching, but like all things with education things that could be seen as negatively impacting some students could positively impact other students. I feel that hybrid learning allows for students to learn in a safer environment in terms of COVID.*
Phase 3: Critical Assessment of Assumptions	Through reflection, identification, and analysis of limiting assumption e.g., what does it mean to you to feel this?	*Students fell behind in the content that needed to be learned. Students learn best in the classroom and need to be face-to-face all the time. I noticed in my practicum that students' basic math skills in an upper level were not high. A lot on the hybrid really didn't focus like they should and I feel barely listened.* *There are some students who are able to handle the course load work entirely online and keep up with their grades, but I am only seeing a small percentage of students being able to do that.*
Phase 4: Recognition of Transformation	The emergence of thought as to how this could be different by engaging in new roles.	*In returning to schools, students in our district are now 1:1 on devices; this is interestingly enough becoming too tied into daily routines. I do not believe every lesson should be integrated into technology, however, this is what I am seeing. I have been implementing creative practices into my lessons and the students are finding engagement once again.* *I find myself teaching more content based on lower grade ability to whole class than I expected*
Phase 5: Exploration of Options	Target areas in promoting change, analyzing the dangers/benefits of	*Through my own course discussions as well as my own lesson plans, I have placed an extended emphasis on collaboration and peer discussion in the classroom*

Mezirow's Phases of Development	Description of Phase	Comments Aligned to Phase
	staying the same/changing.	*to allow students the opportunity to practice these skills*
Phase 6: Plan a Course of Action	Identifying what one needs to know/ accomplish/overcome for change to occur.	*I want to try to implement new ideas, however, there does not seem to be much room for this with the district and administration adding in more and more frequent testing days*
Phase 7: Acquire Knowledge and Skills	Actively situating the understanding to make the necessary change	*I have become an expert in pivoting my instruction and honing in on the needs of my students in the moment. I have done additional research, especially YouTube examples, of more management and SEL strategies.* *I am interacting with the children and getting to know them.* *I have been pre-teaching beginning concepts so that grade-level concepts can be understood.*

During the pandemic, study 1 captured PSTs' negative views of hybrid instruction by noting students were isolated impacting social and emotional needs. Furthermore, the home environment may have been distracting, causing students to lose focus and not pay attention to the instruction delivered. This lack of focus may factor into the lack of motivation and engagement that reportedly declined when learning in the hybrid modality (Mezirow's Phases 1-3). In study 2, the negative views of *previous* hybrid instruction connected directly to the concerns reported from study 1 by noting a continued concern about engagement and focus during post-pandemic instruction. Furthermore, PSTs noted that students are below grade level expectations and are demonstrating social/emotional behaviors that are reportedly low. In study 2, the follow-up question, "what have you done differently because of these insights in your teaching" PSTs noted, a focus on remediation for content, a higher emphasis on classroom management techniques, and the integration of cooperative learning/peer discussions (Mezirow's Phases 4-7).

Aligned to the *positive* views of hybrid instruction during the pandemic from study 1. PSTs noted students were safe in a time of uncertainty related to health concerns. Furthermore, PSTs reported how students may have benefited by learning in a more isolated environment compared to the classroom environment where aspects of socializing and group work are required (Mezirow's Phases 1-3). Interestingly, in study 2, the *positive* views of hybrid instruction seemed to have shifted to technology specifically. PSTs reported increased use of technology in the classroom during post-pandemic instruction. Many remediation programs that are online track progress and assign remediation lessons based on student needs. PSTs also noted that K-12 students are much more proficient in technology in the post-pandemic classroom with navigating laptop use to include logins and finding/completing assignments. In study 2, the follow-up question, "what have you done differently because of these insights in your teaching" PSTs noted, the integration of technological supports for post-pandemic classroom instruction as a method of formative assessment. PSTs also noted that they ended up incorporating more technology than they thought would be required during their instructional experiences in the classroom (Mezirow's Phases 4-7).

Conclusion

A deeper understanding of our PSTs' journey of transformation during this time assisted in providing us with the awareness that we too were experiencing the phases of transformative learning with our students. Vygotsky (1978) noted, "Through others, we become ourselves." Within this vein, a reflection of our instructional practices mirrored a similar state of dissonance. This mirroring of

experiences and pedagogical shifts has helped us to understand how to better serve our PSTs during this time of recovery in the K-12 classroom. Higher education institutions play a critical role in promoting sustainability practices by promoting reflective practitioners. Encouraging preservice teachers to regularly engage in self-reflection on their teaching methods, student interactions, and instructional strategies is key to achieving this goal. Additionally, integrating technology and arts into education are further sustainability practices that hold much potential during this time of recovery. Effectively incorporating technology and infusing arts in the curriculum empower preservice teachers to enrich student engagement, creativity, and foster critical thinking skills (Capone and Leopre, 2021; Hirsh and Baronak, 2020; Long, 2022). These practices align with areas of future research opportunities, providing avenues for exploring Mezirow's later phases of transformative learning (Phases 8-10), which encompass trying new roles, building self-efficacy, and finally achieving reintegration.

As we actively situate our PSTs' needs to facilitate sustainable teaching and learning practices, we are beginning to understand that an increase in technology integration into our course instruction is needed, with a clear connection to lesson planning and reflection. We also embedded supports in our courses and adjusted our instruction to include an increased emphasis on classroom management techniques aligned with student sense of belonging and social-emotional learning strategies. Aligned to both the lower ability, learning, and engagement amongst students reported by our PSTs, we have begun adding instructional course supports that integrate authentic arts-infused literacy strategies to complement the application of intensive remediation efforts. As a result, we designed a third intervention study focusing on bridging K-12 teaching with arts-infused instructional support for entry-level teachers. We are offering this support to entry and beginning teachers who seem to be struggling with reconciling best practices with what they are experiencing in their post-pandemic classrooms. Through this intervention process, we hope to address the dissonance experienced as PSTs prepare to remediate learning loss that occurred during school closures or while in-between hybrid and in-person modalities (Engzell, et al., 2021; Spector, 2021).

As we embark on this journey with our students, we feel that critical reflection is needed as instructors of future teacher candidates. The UDNP's goal of ensuring inclusive and equitable education for all students by increasing the supply of qualified teachers through intentional teacher training aligns with our goals for providing a more sustainable future in the field of education.

Conflict of Interest

The author(s) disclose that they have no actual or perceived conflicts of interest. The authors disclose that they have not received any funding for this manuscript beyond resourcing for academic time at their respective university.

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