

*ArATE Electronic Journal*  
**Volume 12, Number 2**  
**Fall 2022**

**Editor:**

Dr. Misty LaCour, Purdue University Global

**Co-Editors:**

Dr. C. Neelie Dobbins, Southern Arkansas University

Dr. Lynze Greathouse, Southern Arkansas University

**Peer Reviewers:**

Dr. Shellie Hanna, Arkansas Tech University

Dr. Ryan Kelly, Arkansas State University

Dr. Lisa Oden, Southern Arkansas University

Dr. Alicia Show, Arkansas State University

**Article and Authors:**

**Analysis of Factors Influencing implementation of Project-Based Learning in Career and Technical Education Classrooms**

Sophia Bodishbaugh, University of Arkansas

Sheri Deaton, University of Arkansas

Betsy Orr, University of Arkansas

**Learning Communities are Relationship-Based**

Chelsea K. Bradley, University of Arkansas at Little Rock

**Deepening Learning in Teacher Education: A Framework of Professional Praxis for Teacher Candidates**

Lydia Brauer, Arkansas Tech University

Jan Westrick, Valparaiso University

**Instructional Alignment Research and Answering Correctly: Did I Teach? Did They Learn?**

John Hobe, Georgia Southern University

**Advocating for the Use of Mursion Virtual Reality (VR) Simulation in Preparing Teachers: Charlotte Danielson's Framework for Teacher Preparation, Instruction, and Professionalism of Preservice Teachers During the Covid-19 Pandemic and Beyond**

Natalie Johnson-Leslie, Arkansas State University

H. Steve Leslie, Arkansas State University

**Gifted and Talented Students and Teachers' Perceptions of Effective Teaching Strategies and Engagement**

Emma Riemenschneider, George Junior High School, AR

Betsy Orr, University of Arkansas

Sheri Deaton, University of Arkansas

**Understanding the Need for Collaboration in Response to Intervention in the Schools**

Melinda Salloukh, Hot Springs School District, AR

## **Analysis of Factors Influencing implementation of Project-Based Learning in Career and Technical Education Classrooms**

Sophia Bodishbaugh, University of Arkansas  
Sheri Deaton, University of Arkansas  
Betsy Orr, University of Arkansas

### **Abstract**

Project-based learning (PBL) is a student-based teaching method encouraging individual exploration of specific topics. Teachers of PBL facilitate the process, providing guidance to students as they acquire knowledge. This study analyzed the use of PBL in classrooms and the demographics of the teachers who use it. A survey was distributed to career and technical education (CTE) teachers across the nation. Researchers analyzed the data to determine if there was a link between the demographics of participants and their use of PBL. Results indicate that there was no statistically significant difference in use of PBL based on geographic location, years of experience, or teacher preparation. However, there were significant differences between specific subcategories including use, perceived benefit, and ease of implementation.

### **Introduction**

Teacher education and preparation has been a long-debated topic in the education field and has increased in prevalence due to national teacher shortages. According to the National Center of Education Statistics (NCES), 3.7 million teachers in the United States in the fall of 2019 served the 48.1 million students enrolled in public and private schools (2021). Despite these large numbers, there has been a significant increase in the number of teachers leaving the profession. The U.S. Bureau of Labor Statistics predicts that more than 270,000 educators will leave the profession each year from 2016 to 2026 (Torpey, 2018). This has led to a decrease in the supply of teachers and an increase in teacher demand. To address the discrepancies in teacher supply and demand, some districts are hiring educators with fewer years of experience or alternatively licensed teachers. Many districts are focusing on the quantity of staff needed rather than the qualifications of those teachers.

Additionally, teachers have begun to increase their use of student-centered learning techniques. Student-centered learning techniques help students to construct knowledge and enhance higher learning thinking skills (Jaiswal & Al-Hattami, 2020). One student-centered learning technique is project-based learning (PBL). This study aims to identify the statistical difference between teacher demographics, including geographic location, years of experience, licensure methods, and degree level, and their implementation of PBL.

### **Review of Literature**

The term project-based learning (PBL) was officially coined by William Heard Kilpatrick (Lauzon, 2015). Inspired by John Dewey's educational theories regarding hands-on learning, Kilpatrick wrote and published "The Project Method" in 1918 (Lauzon, 2015). This publication and his teachings at Columbia University promoted an educational system that engaged students in every part of the learning process (Lauzon, 2015). Though the origin of PBL was over a

century ago, the method has remained popular and has been modified to better adapt to today's learners.

Similar to Kilpatrick's project method, PBL involves students in all aspects of learning. Students start by asking questions about a topic, then continue researching their topic, creating a product to present to others, and then evaluating themselves (Deaton & Daugherty, 2020). Meanwhile, the teacher serves as a facilitator, providing assistance and guiding, rather than leading the lesson (Helle, Tynjala & Olkinuora, 2006). PBL allows students to apply the content they are learning as they engage in creating a project. Lectures, worksheets, and rote memorization provide surface-level knowledge of content, while projects allow students to dive deeper and apply their knowledge (Deaton & Daugherty, 2020). The presentation aspect of PBL allows students to achieve the highest level of Bloom's Taxonomy of Learning (Nkhoma, Lam, Sriratanaviriyakul, Richardson, Kam & Lau, 2017). Educators who implement PBL enable students to achieve the highest level of thinking and demonstrate their complete understanding of a topic.

In addition to PBL, problem-based learning is another instructional method employed in classrooms. In problem-based learning, students are still self-guided and perform their own research (Helle et al., 2006). However, instead of creating an end product, work is theoretical and strictly used to answer questions as learners solve problems (Brassler & Dettmers, 2017). While these methods can lend themselves to one another, this study analyzes PBL or self-guided learning that results in a product. Documented benefits of PBL include promoting collaboration skills, increasing active listening skills, and developing discipline, responsibility, and independence in students (Bell, 2010). PBL has also been found to have a positive effect on students' standardized test results. When comparing the standardized test results of students exposed to PBL versus those not exposed, the students who participated in PBL were found to do better (Bell, 2010).

The most notable factor in comparing teacher effectiveness and geographic location has been found to be the school's socioeconomic status (Gagnon, 2015). Students in disadvantaged communities are more likely to face factors outside of school that impact learning (Berliner, 2009). This can make it more difficult for teachers to be effective, regardless of their ability (Gagnon, 2015). Additionally, schools with a higher percentage of students in the low socioeconomic range are twice as likely to hire educators certified in a field different from what they will be teaching (Gagnon, 2015).

When analyzing the difference between years of experience and student achievement, studies have found an increase in student achievement after teachers' second year of teaching (Blazer, 2012). Educators produce more successful students after teaching for at least two years. This means that teacher experience has been found to have more of an impact on student achievement than teacher preparation (Blazer, 2012). Previous research conducted with the emphasis on analyzing student success through alternatively licensed teachers has been found to be contradictory (Blazer, 2012). Some studies find that traditionally licensed educators produced more consistent student success (Blazer, 2012). Results of other studies indicated that alternatively licensed teachers produce greater student achievement gains (Blazer, 2012). No true correlation has been found between teacher licensure pathways and student success.

### **Methodology**

The purpose of this study was to determine if there is a relationship between the frequency of PBL use in the classroom and the demographics of teachers, including geographic location, years

of experience, and method of teacher preparation. The following research questions were developed to better understand the relationship between the use of PBL in the classroom and the demographics of teachers who use this strategy.

1. What is the difference in teachers' perspectives on PBL activities based on teachers' geographic locations?
2. What is the difference in teachers' perspectives on PBL based on years of teaching experience?
3. What is the difference in teachers' perspectives on PBL activities based on teachers' preparation in two specific subcategories: a) traditional or alternative licensure and b) degree level: bachelors or postgraduate (masters or doctorate degrees) work?

### **Development of the Instrument**

A pilot study of the instrument was conducted in September of 2021. Participants of this study were CTE teachers in the researcher's state. The convenience audience ranged from 1-45+ years of being an educator. The participants in this pilot study were emailed a link to the Google Form survey with an invitation to participate. Embedded within the Google Form were the informed consent and survey questions. The instrument was separated into three categories: teacher demographics, use of PBL in the classroom, and professional development related to PBL.

The first part of the survey included questions related to teacher demographics including teacher's geographic location, education preparation pathway, degree and certifications, and grade levels taught. Participants answered questions related to their frequency of use of PBL, perceived benefit of PBL, ease of using PBL, the impact of PBL in their classroom, and the role that PBL plays in furthering students' development of 21st-century skills. Individual responses were on a five-point scale where 1= Strongly Disagree and 5=Strongly Agree. Quantitative questions were converted to a numerical scale to compare data. A Cronbach's coefficient alpha test was conducted on the completed assessments to establish reliability. Cronbach's alpha is used to measure the internal consistency of a test or study (Tavakol & Dennick, 2011). The reliability of this study was found to be high (Cronbach's alpha = 0.94).

Based on feedback from the pilot audience, changes were made to the survey instrument prior to sending it out to the national audience. Changes included addressing grammatical issues, increasing clarity in directions, and formatting issues. A question regarding 21st-century skills students gain when educators do not intentionally focus on PBL was deemed unrelated to research questions and deleted from the survey.

### **Research Design Overview**

This study was a quantitative study, which involved processing and analysis of numerical data. Quantitative studies are often used to make predictions or analyze the relationship between two ideas or concepts (Warren, 2020). Analysis of quantitative data was selected to investigate the relationship between the geographic location, years of experience, mode of preparation, and the use of PBL.

### **Population of the Study**

The description of the study and a link to the survey were distributed through social media posts and emailed to CTE teachers across the United States. These were posted to the

Arkansas Family and Consumer Science Facebook wall (potential audience = 375 members), National Family and Consumer Sciences Teachers Facebook wall (potential audience = 18,200), and the National Business Technology Education Facebook wall (potential audience = 9,600). Furthermore, a description of the research study and a link to the survey was emailed to the Arkansas Family and Consumer Sciences state listserv (potential audience = 2,000). A total of 76 participants granted consent and completed the electronic survey. Participants involved in this study included 63 educators from the Southeast region of the United States (AL, AR, FL, GA, KY, LA, MS, NC, SC, TN, VA, WV), four participants from the Midwest (IA, IL, IN, KS, MI, MN, MO, ND, NE, OH, SD, WI), one participant from the Northeast (CT, DC, DE, MA, MD, ME, NH, NJ, NY, PA, RI, VT), three from the Southwest (AZ, NM, OK, TX) and five participants from the West (AK, CA, CO, HI, ID, MT, NV, OR, UT, WA, WY).

### **Data-Collection Methods**

This survey was disseminated through social media and email listservs in September 2021, using Google Forms to collect data. A consent form was embedded at the beginning of the survey, and continuation in the survey indicated consent of data to be used. There were 76 responses to the survey. The researcher collected and analyzed the results of this assessment by utilizing Google Sheets to create a spreadsheet. Data were cleaned, organized, sorted, and then uploaded and analyzed utilizing Microsoft Excel. Data were organized according to research questions related to geographic location, years of experience, and teacher preparation pathways.

### **Findings and Analysis**

This study sought to find the differences between the demographics of CTE teachers and their implementation of PBL, specifically the use, benefit, ease, and perceived excitement of students. When looking at the use of PBL, participants were asked to rank how frequently they used PBL in their classroom. Benefit refers to the perceived benefit that participants have seen PBL have on their students' learning. Participants were also asked to rank how easy it was to implement PBL in their classroom. Excitement refers to how excited participants perceived their students to be regarding PBL. Results from this study indicate that while participants view these four areas differently, their perceptions are not correlated to their geographic location, years of experience, or teacher preparation.

Research Question 1: What is the difference in teachers' perspectives on PBL activities based on teachers' geographic locations?

To better understand differences in teachers' perspectives on PBL activities and the connection this has to their geographic location, a one-way analysis of variance (ANOVA) was conducted. ANOVA is a statistical strategy used to compare the means of more than two sets of data to determine if there is a statistical difference (Maxwell & Delaney, 2004). Specifically, the ANOVA was used to determine if there was a statistical difference in participants' perceptions for the specific subcategories of PBL integration (use, excitement, benefit, and ease) on the assessment. The independent variable included four different categories related to participant perceptions related to PBL: participants' use of PBL in the classroom, perceived student excitement when using PBL as an instructional approach, perceived benefit of using PBL, and ease of implementing PBL in the classroom. The dependent variable was the participants'

perception scores. This study's data satisfied the three assumptions of independent observations, normal population distribution, and the same variances.

Research question one asks what the difference is between teachers' perspectives of PBL and their geographic location. Based on results from the survey, there was not sufficient data to analyze participants' responses from the Midwest ( $N = 4$ ), Northeast ( $N = 1$ ), Southwest ( $N = 3$ ), and West ( $N = 5$ ) regions. An ANOVA was run on participants from the Southeast region ( $N = 63$ ) to determine if there was a significant difference in how participants involved in this study viewed the four subcategories. There was a significant difference in the results for the participants' perceptions involved in this study with a  $p < .05$  level for the four conditions,  $F(3, 248) = 4.64, p < .001$ .

Post hoc tests were used to evaluate which subcategory the participants' perceived to be most important. When ANOVA results indicate a statistically significant difference, post hoc  $t$ -tests are used to determine differences between specific pairs of means (Frost, 2021).  $T$ -tests were conducted to evaluate pairwise differences among the means. With an alpha set at .05, the difference between the subcategories use ( $M=4.06$ ) and benefit ( $M= 4.59$ ) was statistically significantly different,  $t(63) = 2.00, p < .001$ . The difference between the subcategories excitement ( $M = 4.16$ ) and benefit ( $M = 4.59$ ) was statistically significant  $t(63) = 2.00, p < .001$ , and the difference between benefit ( $M = 4.59$ ) and ease ( $M = 4.17$ ) was also statistically significant  $t(63), = 2.00, p < .001$ . The differences between the following subcategories were not statistically significant: excitement ( $M = 4.16$ ) and ease ( $M= 4.17$ ) [ $t(63), = 2.00, p = .92$ ], use ( $M = 4.06$ ) and ease ( $M = 4.17$ ) [ $t(63), = 2.00, p = .51$ ], and use ( $M = 4.06$ ) and excitement ( $M = 4.16$ ) [ $t(63), =2.00, p= .55$ ]. See Table 1.

**Table 1**

*Participant responses from Southeast: ANOVA Analysis by Subcategory*

Subcategory	<i>M</i>	<i>SD</i>	Confidence Intervals
Benefit	4.59	0.61	4.43-4.74
Excitement	4.16	0.88	3.94-4.38
Ease	4.17	0.99	3.92-4.42
Use	4.06	0.90	3.84-4.29

Note: Chart reflects data from participants involved in this study.

Based on the limited data received from other regions, researchers were unable to determine if there was a statistical significance between how participants viewed the four PBL subcategories based on their geographical location. However, data from the Southeast region shows that participants in this study believe there is a benefit to using PBL. The largest mean difference was found between participants' opinions regarding the perceived benefit of PBL and

the frequency at which they use it. According to Deaton and Daugherty (2020), PBL requires students to ask questions, conduct research, and create a product to present to others. This process can take time. Participants in this study could feel that this process is long, taking away from time that could be dedicated to other curriculum. Results from this study also show that participants' mean perception of PBL in the classroom and the excitement of students to be about the same.

Research Question 2: What is the difference in teachers' perspectives on PBL based on years of teaching experience?

To analyze the findings of the individuals involved in this study, participants were placed into two groups, with participants with 0-10 years of teaching experience ( $N=41$ ) in one group, and participants with 11-40+ years of teaching experience ( $N = 35$ ) in the second group. Dividing the responses in this manner created relatively even groups due to participant responses and years of experience. An ANOVA was run on participants with 0-10 years of teaching experience to determine if there was a significant difference in how participants involved in this study viewed the four subcategories. There was a significant difference in the results for the participants involved in this study with a  $p < .05$  level for the four conditions,  $F(3, 160) = 3.88, p < .001$ .

Post hoc  $t$ -tests were used to evaluate which subcategory the participants' perceived to be most important. Follow up tests were conducted to evaluate pairwise differences among the means. With an alpha set at .05, the difference between the subcategories use ( $M = 4.17$ ) and benefit ( $M = 4.68$ ) was statistically different,  $t(41) = 2.00, p < .001$ . The difference between the subcategories benefit ( $M = 4.68$ ) and ease ( $M = 4.29$ ) was statistically significant,  $t(41) = 2.00, p < .001$ . The difference between excitement ( $M = 4.10$ ) and benefit ( $M = 4.68$ ) was also statistically significant,  $t(41) = 2.00, p < .001$ . The difference between the following subcategories were not statistically significant: use ( $M = 4.17$ ) and excitement ( $M = 4.09$ ) [ $t(41), = 2.00, p = .71$ ], use ( $M = 4.17$ ) and ease ( $M = 4.29$ ) [ $t(41), = 2.00, p = .56$ ], and excitement ( $M = 4.10$ ) and ease ( $M = 4.29$ ) [ $t(41), = 2.00, p = .37$ ]. See Table 2.

**Table 2**

*Participant responses with 0-10 years of experience: ANOVA Analysis by Subcategory*

Subcategory	$M$	$SD$	Confidence Intervals
Benefit	4.68	0.52	4.52-4.85
Excitement	4.10	0.92	3.81-4.39
Ease	4.29	1.03	3.97-4.62
Use	4.17	0.83	3.91-4.43

Note: Chart reflects data from participants involved in this study with 0-10 years of experience.



Participants in this study in the first group with 0-10 years of teaching experience ( $N = 41$ ) indicated they perceived the benefit of PBL to be significantly higher than the other three subcategories. This means participants see a benefit of using PBL in their classrooms, even if they do not perceive it to be easy to implement, use it frequently, or see students' excitement. The largest difference was between how participants viewed the benefit of PBL and their perceptions of students' excitement. Although participants do not perceive student excitement from using PBL as high, they do believe there is a benefit to using PBL. Consequently, there was little difference between the frequency of use of PBL and perceived students' excitement. Again, participants involved in this study reported they were less likely to do activities that their students do not enjoy. An increase in excitement can often lead to an increase in engagement and implementation in the classroom.

An ANOVA was run on participants with 11-40 years of teaching experience to determine if there was a significant difference in how participants involved in this study viewed at least one of the four subcategories. There was not a significant difference in the results for the participants involved in this study for the four subcategories conditions,  $F(3, 136) = 2.16, p = .10$ . Results from this sample show that participants involved in this study were more likely to view all four subcategories (use, benefit, excitement, and ease) in a similar manner. See Table 3.

**Table 3**

*Participant responses with 11-40 years of experience: ANOVA Analysis by Subcategory*

Subcategory	<i>M</i>	<i>SD</i>	Confidence Intervals
Benefit	4.42	0.70	4.19-4.67
Excitement	4.31	0.80	4.04-4.59
Ease	4.06	0.91	3.75-4.37
Use	3.97	1.01	3.62-4.32

Note: Chart reflects data from participants involved in this study with 11-40 years of experience.

When comparing groups of participants involved in this study that had 0-10 years of teaching experience ( $N=41$ ) to participants with 11-40+ years of teaching experience ( $N=35$ ), the data reveals participants in these groups did not view the four subcategories of PBL differently. A *t*-test was conducted and there was not a significant difference in the results on perceptions of the four categories based on the two teaching experience groups involved in this study [ $t(41, 35), = 2.00, p = 0.42$ ].

For participants involved in this study, results indicate that the number of years of teaching experience does not significantly impact participants' perceptions of PBL. Other research has shown that experience does not impact the effectiveness of teaching until after the second year (Gürgil, 2018). Since this study compares teachers with 0-10 years to 11-40 years of

experience, researchers were not able to determine if first- and second-year participants viewed PBL differently than those with 3+ years.

Participants with 0-10 years of experience viewed PBL as more beneficial ( $M = 4.68$ ) than participants with 11-40 years of experience ( $M = 4.43$ ). While variations of PBL have been around since 1918, it has gained popularity in the past decade (Lauzon, 2015). Participants who have less experience in the teaching professions (those that have taught for less than 10 years), might be more likely to have been taught about PBL in their teacher training program. This could lead to an increase in the perceived benefit of incorporating PBL in their classrooms.

Research Question 3: What is the difference in teachers' perspectives on PBL activities based on teachers' preparation regarding these two specific subcategories:

- a) traditional or alternative licensure
- b) bachelors or postgraduate (masters or doctorate degrees) work

An ANOVA was run on participants ( $N = 43$ ) who indicated that they were trained through a traditional teacher licensure program to determine if there was a significant difference in how participants involved in this study viewed the four subcategories. There was a significant difference involved in this study with a  $p < .05$  level for the four conditions,  $F(3, 168) = 4.13$ ,  $p < .001$ . Table 4 shows the participant responses trained through traditional licensure programs. Post hoc  $t$ -tests were used to evaluate which subcategory the participants' perceived to be most important.

**Table 4**

*Participant responses trained through traditional teacher licensure program: ANOVA Analysis by Subcategory*

Subcategory	$M$	$SD$	Confidence Intervals
Benefit	4.63	0.66	4.43-4.83
Excitement	4.09	0.95	3.80-4.38
Ease	4.37	0.82	4.12-4.62
Use	4.05	1.02	3.73-4.36

Note: Chart reflects data from participants involved in this study trained through traditional teacher licensure program

Follow up tests were conducted to evaluate pairwise differences among the means. With an alpha set at 0.05, the difference between the subcategories use ( $M = 4.05$ ) and benefit ( $M = 4.63$ ) was statistically different,  $t(43) = 2.00$ ,  $p < .001$ . The difference between the subcategories excitement ( $M = 4.09$ ) and benefit ( $M = 4.63$ ) was statistically significant,  $t(43) = 2.00$ ,  $p < .001$ . The differences between the following subcategories were not statistically significant: use ( $M =$

4.05) and excitement ( $M = 4.09$ ) [ $t(43) = 2.00, p = .83$ ], use ( $M = 4.05$ ) and ease ( $M = 4.37$ ) [ $t(43) = 2.00, p = .11$ ], and excitement ( $M = 4.09$ ) and ease ( $M = 4.37$ ) [ $t(43) = 2.00, p = .15$ ], benefit ( $M = 4.63$ ) and ease ( $M = 4.37$ ) [ $t(43) = 2.00, p = .11$ ].

The difference between use and benefit was found to be statistically significant. Participants who were traditionally licensed reported a higher perceived benefit for the use of PBL in the classroom, however, the score for use was significantly lower. The difference between subcategories excitement and benefit was also found to be statistically significant. According to Deaton and Daugherty (2020), PBL requires students to be an active part of the learning process. This means that students must participate in order to learn. It is possible that the participants' students did not want to take an active part in the learning, therefore not expressing excitement regarding PBL. By requiring more work, PBL could be less attractive to students. An ANOVA was run on participants ( $N=33$ ) who indicated that they achieved licensure through an alternative teacher licensure program to determine if there was a significant difference in how participants involved in this study viewed the four subcategories. There was a significant difference involved in this study with a  $p < .05$  level for the four conditions,  $F(3, 128) = 2.78, p < .001$ . See Table 5.

**Table 5**

*Participant responses trained through alternative teacher licensure program: ANOVA Analysis by Subcategory*

Subcategory	<i>M</i>	<i>SD</i>	Confidence Intervals
Benefit	4.48	0.57	4.28-4.67
Excitement	4.33	0.74	4.07-4.59
Ease	3.94	1.12	3.54-4.34
Use	4.12	0.78	3.84-4.40

Note: Chart reflects data from participants involved in this study trained through alternative teacher licensure program

Post hoc *t*-tests were used to evaluate which subcategory the participants' perceived to be most important. Follow-up tests were conducted to evaluate pairwise differences among the means. With an alpha set at 0.05, the difference between the subcategories use ( $M = 4.12$ ) and benefit ( $M = 4.48$ ) was statistically different,  $t(33) = 2.00, p < .001$ . The difference between the subcategories benefit ( $M = 4.48$ ) and ease ( $M = 3.93$ ) was statistically significant,  $t(33) = 2.00, p < .001$ . The difference between the following subcategories were not statistically significant: use ( $M = 4.12$ ) and excitement ( $M = 4.33$ ) [ $t(33) = 2.00, p = .26$ ], use ( $M = 4.12$ ) and ease ( $M =$

4.94) [ $t(33)$ , =2.00,  $p = .45$ ], and excitement ( $M = 4.33$ ) and ease ( $M = 3.94$ ) [ $t(33)$ , =2.00,  $p = .10$ ], excitement ( $M = 4.33$ ) and benefit ( $M = 5.48$ ) [ $t(33)$ , =2.00,  $p = .35$ ].

The difference between subcategories use and benefit were found to be statistically significant. Alternatively licensed participants' mean scores indicated they could see the benefit in using PBL but did not often incorporate it into their curriculum. This could be because many alternative licensure programs do not cover material relating to PBL. This would also explain the statistical difference found in benefit and ease. If alternatively licensed participants were not taught about PBL and how to incorporate it into their curriculum, it can be assumed that they would find it difficult to use and be less likely to use it. Additionally, other research has found that alternatively licensed teachers have less self-confidence when it comes to planning curriculum and incorporating learning techniques for diverse students (Gürgil, 2018). Participants that are not confident in their ability to use PBL are going to use it less often, even if they perceive student benefit.

When comparing groups of participants involved in this study that were traditionally licensed ( $N = 43$ ) to participants that pursued an alternative licensure program ( $N = 33$ ), the data revealed participants in these groups did not view the combined four subcategories of PBL differently. With an alpha set at 0.05, a post-hoc  $t$ -test determined there was not a significant difference in the results for the participants involved in this study [ $t(43,33)$ , = 2.00,  $p = .66$ ]. The results lead researchers to believe that the licensure program participants took did not impact any of the four combined subcategories of their perception of PBL. Participants that went through the traditional licensure process viewed the benefit, ease, use, and perceived student excitement the same as those who went through a non-traditional licensure process. Although the processes might differ or have different requirements, those variances did not impact participants' perceptions of PBL.

To better understand the second part of this research question, analyzing the differences in teachers' perspectives on PBL activities based on their degree obtained, two groups were created with participants who have obtained a bachelor's degree ( $N = 33$ ) in one group and teachers with postgraduate experiences ( $N = 43$ ) in the second group. An ANOVA was run on participants in the first group who had obtained a bachelor's degree to determine if there was a significant difference in how participants involved in this study viewed the four subcategories. There was a significant difference involved in this study with a  $p < .05$  level for the four conditions,  $F(3, 128) = 3.10$ ,  $p < .001$ . See Table 6.

**Table 6**

*Participant responses obtained bachelor's degree: ANOVA Analysis by Subcategory*

Subcategory	<i>M</i>	<i>SD</i>	Confidence Intervals
Benefit	4.55	0.62	4.33-4.76
Excitement	4.39	0.79	4.11-4.67
Ease	4.18	0.92	3.86-4.51
Use	3.97	0.92	3.64-4.30

Note: Chart reflects data from participants involved in this study who have received only a bachelor's degree

Post hoc *t*-tests were used to evaluate which subcategory the participants' perceived to be most important. Follow-up tests were conducted to evaluate pairwise differences among the means. With an alpha set at 0.05, the difference between the subcategories use ( $M = 3.97$ ) and excitement ( $M = 4.39$ ) was statistically different,  $t(33) = 2.00, p < .001$ . The difference between the subcategories use ( $M = 3.97$ ) and benefit ( $M = 4.55$ ) was statistically significant,  $t(33) = 2.00, p < .001$ . The difference between the following subcategories were not statistically significant use ( $M = 3.97$ ) and ease ( $M = 4.18$ ) [ $t(33), = 2.00, p = .35$ ], excitement ( $M = 4.39$ ) and benefit ( $M = 4.55$ ) [ $t(33), = 2.00, p = .39$ ], and excitement ( $M = 4.39$ ) and ease ( $M = 4.18$ ) [ $t(33), = 2.00, p = .32$ ], benefit ( $M = 4.55$ ) and ease ( $M = 4.18$ ) [ $t(33), = 2.00, p = .06$ ]. Participants in this group reported they were less likely to use PBL, but generally saw the benefits, found it easy to use, and perceived that their students were excited.

Participants in the second group ( $N = 43$ ) included those who have postgraduate experiences including teachers who have earned their masters or doctoral degrees. An ANOVA was run on participants in this second group to determine if there was a significant difference in how participants involved in this study viewed the four subcategories. There was a significant difference involved in this study with a  $p < .05$  level for the four subcategories,  $F(3, 168) = 3.00, p < .001$ . See Table 7.

**Table 7***Participant responses obtained postgraduate degree: ANOVA Analysis by Subcategory*

Subcategory	<i>M</i>	<i>SD</i>	Confidence Intervals
Benefit	4.58	0.63	4.39-4.77
Excitement	4.05	0.90	3.77-4.32
Ease	4.19	1.03	3.87-4.50
Use	4.16	0.92	3.88-4.45

\*Chart reflects data from participants involved in this study who have received a postgraduate degree.

Post hoc *t*-tests were used to evaluate which subcategory the participants' perceived to be most important. Follow-up tests were conducted to evaluate pairwise differences among the means. With an alpha set at 0.05, the difference between the subcategories use ( $M = 4.16$ ) and benefit ( $M = 4.58$ ) was statistically different,  $t(43) = 2.00, p < .001$ . The difference between the subcategories excitement ( $M = 4.05$ ) and benefit ( $M = 4.58$ ) was statistically significant,  $t(43) = 2.00, p < .001$ . The difference between the subcategories benefit ( $M = 4.58$ ) and ease ( $M = 4.19$ ) was also statistically significant,  $t(43) = 2.00, p < .001$ . The difference between the following subcategories were not statistically significant: use ( $M = 4.16$ ) and excitement ( $M = 4.05$ ) [ $t(43), = 2.00, p = .56$ ], use ( $M = 4.16$ ) and ease ( $M = 4.19$ ) [ $t(43), = 2.00, p = .91$ ], and excitement ( $M = 4.05$ ) and ease ( $M = 4.19$ ) [ $t(43), = 2.00, p = .50$ ]. Participants involved in some graduate level education perceived the benefit of PBL to be high. A statistically significant difference was found between perceived benefit and the ease, use, and excitement of PBL. It is possible that further education exposes participants to the benefits of using PBL, increasing their awareness of PBL and benefits for students.

When comparing groups of participants involved in this study that received a bachelor's degree ( $N = 33$ ) to participants who have completed some post graduate education ( $N = 42$ ), the data reveals participants in these groups did not view the four subcategories of PBL differently. With an alpha set at 0.05, a post hoc *t*-test determined there was not a significant difference in the results for the participants involved in this study [ $t(33, 42), = 2.00, p = .82$ ]. For participants involved in this study, the level of education did not impact their perceptions of PBL. Similar to the first part of research question three, where researchers analyzed the licensure path of participants, variances in programs did not impact participants' perceptions of PBL. This could be because PBL is not covered, or not covered in depth in the curriculum of graduate programs. Additionally, this survey did not ask participants to determine what kind of graduate experience they had received. It is possible that some participants received graduate experience in a field outside of education.

## **Limitations**

The limitations to this study include limited demographics. The survey was voluntary, and surveyors could not ensure a response from every demographic category. Because of this limitation, researchers did not receive adequate data to analyze the geographical locations of participants and their perceptions of PBL. Additionally, the findings from this study are based on one instrument. Use of a singular instrument could lead to inaccurate or biased data. Additionally, data from this study is self-reported by participants who chose to be a part of this study. Therefore, the findings only reflect the voices of those who chose to participate. Finally, this research was conducted as teachers were still engaged in facilitating learning during the COVID-19 pandemic. Researchers recognized that the pandemic and disruption of education flow could impact how participants view the use of PBL.

## **Summary of Findings**

Researchers did not receive enough geographical data and participants' perceptions of PBL to answer research question one. Therefore, results from only the Southeast region were analyzed. A notable finding for participants in the Southeast region was their reported perceived benefit of PBL was statistically significant in contrast with their reported use of PBL in the classroom. Regarding research question two, a statistically significant difference was not found between perspectives of participants with 0-10 years of teaching experience and participants with 11-40 years of teaching experience. Regarding the first part of research question three, a statistically significant difference was not found between participants' perceptions of PBL and their licensure path. Teachers who were traditionally licensed viewed PBL similarly to alternatively licensed educators. Regarding the second part of research question three, a statistically significant difference was not found between participants' perspectives on PBL who received a bachelor's degree and participants who had completed some post graduate work. Regardless of how the data was analyzed, participants involved in this study viewed the use, ease, and perceived student excitement of PBL to be about the same. Additionally, analysis of the data from multiple lenses revealed that participants involved in this study reported a higher perceived benefit for PBL than any other subcategory.

Results from this study indicate that participants across the board see the benefit of PBL implementation in the classroom; however, their reported use of PBL is significantly different. The last question on the survey (#17), asked "If my administration provided more resources and/or professional development targeted towards project-based learning, I would be more likely to utilize project-based learning in my classroom." While this was not a central research question, the data supplied by participants assisted the researchers with understanding the perspectives of the teachers in this sample.

Following the same five-point scale where 1= Strongly Disagree and 5=Strongly Agree the mean score for participants on this question was 3.84 with a standard deviation of 1.02. Only six participants (8%) either strongly disagreed or disagreed with the statement, whereas 45 participants (59%) strongly agreed or agreed with this prompt. Results from this sample indicate that participants involved in this study would be more likely to utilize PBL in the classroom if they were given more resources and/or professional development targeted toward the implementation of PBL.

### Recommendations for Future Research

At the conclusion of this study, researchers identified areas that require more extensive research to better understand the data that were found through this survey. The first recommended area of research would be to complete a mixed-method study that analyzes quantitative and qualitative data. This study would provide numerical data to support or oppose findings of this study and would provide case studies as to why participants answered the way they did. Additionally, researchers believe it would be beneficial to complete a more in-depth analysis of participants' geographical location. Data from other studies have led researchers to believe that teacher effectiveness could be impacted by the type of community a teacher teaches in (rural, urban, public schools, private schools, etc.). Analyzing this and a teacher's perceptions of PBL could provide insightful results.

### Conclusions

The National Education Association (NEA) recently reported a significant increase in the percentage of educators who considering leaving the profession earlier than they had planned (Walker, 2022). As teacher shortages have continued to rise, schools have experienced an increase in need for qualified individuals who will increase student engagement. While there is no singular answer to solving the problems of understaffed schools, one way to increase student engagement is to empower all educators in their abilities to facilitate PBL. Project-based learning reflects a student-centered approach built on investigating a topic and creating a product to showcase their understanding (Deaton & Daugherty, 2020). Regardless of method of licensure, years of experience, or geographic location, an increase in understanding about the implementation of PBL could prove beneficial to students' learning.

While participants in this study perceived a benefit behind implementing PBL, data revealed a significant difference between their perceived benefit and their actual use and reported ease of implementation in the classroom. Based on the results of this study, researchers believe that teachers may see that PBL is beneficial in increasing student engagement, but they still need to be trained to implement more in the classroom. Rather than adding another thing to educators' workload, professional development targeted toward specifics of how to use PBL may increase not only their understandings of PBL but may also increase their implementation of this student-centered strategy in the classroom. Classrooms filled with students who are on task and engaged are what teachers dream of creating. Implementation of PBL in the classroom will not solve every problem nor will it guarantee complete student engagement, however, research indicates that PBL, when implemented correctly, can be used to benefit students in a variety of ways, including developing 21st-century skills such as collaboration, communication, and dependability. Educators should consider how they could implement PBL in their classroom, and districts should consider how they could support teachers who want to grow in their professional competencies related to the implementation of PBL.

### References

- National Center for Education Statistics (NCES). (2021). *Back-to-School Statistics*.  
<https://nces.ed.gov/fastfacts/display.asp?id=372#K12-enrollment>
- Barghaus, K. M., Bradlow, E. T., McMaken Jennifer, & Rikoon Samuel H. (n.d.). Assessing and measuring workforce readiness: A discussion toward the development of a universal and valid measure book title: Preparing today's students for tomorrow's jobs in metropolitan



- america. In *Preparing Today's Students for Tomorrow's Jobs in Metropolitan America* (pp. 37–56).
- Bell, S. (2010). Project-Based Learning for the 21st Century: Skills for the future. *The Clearing House: A Journal of Educational Strategies, Issues and Ideas*, 83(2), 39–43. <https://doi.org/10.1080/00098650903505415>
- Berliner, D. C. (2005). The near impossibility of testing for teacher quality. *Journal of Teacher Education*, 56(3), 205–213. <https://doi.org/10.1177/0022487105275904>
- Blazer, C. (2012). What the research says about Alternative Teacher Certification Programs at a glance. *Information Capsule*, 1104.
- Brassler, M., & Dettmers, J. (2017). How to enhance interdisciplinary competence—Interdisciplinary Problem-Based Learning versus Interdisciplinary Project-Based Learning. *Interdisciplinary Journal of Problem-Based Learning*, 11(2). <https://doi.org/10.7771/1541-5015.1686>
- Britannica, T. Editors of Encyclopedia (2018). Secondary education. *Encyclopedia Britannica*. <https://www.britannica.com/topic/secondary-education>
- Bustamante, J. (2019). Percentage of high school graduates that go to college. *Education Data*. <https://educationdata.org/high-school-graduates-who-go-to-college>
- Claymier, B. (2014). *Teaching 21st Century Skills Through an Integrated STEM Approach*
- Deaton, S., & Daugherty, M. K. (2020). FCS: Meeting the needs of students through Project Based Learning. *Journal of Family & Consumer Sciences*, 112(2), 70–75. <https://doi.org/10.14307/JFCS112.3.70>
- Frost, J. (2021). Using post hoc tests with ANOVA. *Statistics By Jim*. <https://statisticsbyjim.com/anova/post-hoc-tests-anova/>.
- Gallup. (2013). *21st Century Skills and the Workplace*.
- Gagnon, D. (2015). School location and teacher supply: Understanding the distribution of teacher effects. In *Current Issues in Education*, 18(3). <http://cie.asu.edu/ojs/index.php/cieatasu/article/view/1473>
- Gürgil, F. (2018). Table, graphic, and diagram interpretation and preparation skills: Social Studies and Geography teachers' practice and beliefs. *Beliefs. Review of International Geographical Education Online (RIGEO)*, 8(3), 517–541. [www.rigeo.org](http://www.rigeo.org)<http://www.rigeo.org/vol8no3/Number3winter/RIGEO-V8-N3-6.pdf>
- Helle, L., Tynjälä, P., & Olkinuora, E. (2006). Project-Based Learning in Post-Secondary Education: Theory, practice and rubber sling shots. *Higher Education*, 51(2), 287–314. <https://doi.org/10.1007/s>
- Jaiswal, P., & Al-Hattami, A. (2020). Enhancing learners' academic performances using student centered approaches. *International Journal of Emerging Technologies in Learning (IJET)*, 15(16), 4. <https://doi.org/10.3991/ijet.v15i16.14875>
- Lauzon, G. P. (2015). Hidden in plain sight: The project method's obscured origins. *American Educational History Journal*, 42(1), 13–32.
- Maxwell, S. E., & Delaney, H. D. (2004). *Designing experiments and analyzing data: A model comparison perspective* (Second ed.). Lawrence Erlbaum Associates.
- Nkhoma, M. Z., Lam, T. K., Sriratanaviriyakul, N., Richardson, J., Kam, B., & Lau, K. H. (2017). Unpacking the revised Bloom's Taxonomy: Developing case-based learning activities. *Education and Training*, 59(3), 251–264. <https://doi.org/10.1108/ET-03-2016-0061>
- LibGuides. (n.d.). *Quantitative research and analysis: Quantitative methods overview*.

- <https://lib-guides.letu.edu/quantresearch>.
- Stone, J. R. (2017). Introduction to pathways to a productive adulthood: The role of CTE in the American high school. In *Peabody Journal of Education*, 92(2). pp. 155–165. Routledge.  
<https://doi.org/10.1080/0161956X.2017.1302207>
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach's alpha. *International Journal of Medical Education*, 2, 53–55. <https://doi.org/10.5116/ijme.4dfb.8dfd>
- Torpey, E. (2018). *Projections for teachers: How many are leaving the occupation?*  
U.S. Bureau of Labor Statistics.  
<https://www.bls.gov/careeroutlook/2018/data-on-display/how-many-teachers-are-leaving.htm>
- Walker, T. (2022). *Survey: Alarming number of educators may soon leave the profession*. National Education Association (NEA).  
<https://www.nea.org/advocating-for-change/new-from-nea/survey-alarming-number-educators-may-soon-leave-profession>
- Warren, K. (2020). Qualitative vs quantitative research, data & analysis. *Grad Coach*.  
<https://gradcoach.com/qualitative-vs-quantitative-research/>

## **Learning Communities are Relationship-Based**

Chelsea K. Bradley, University of Arkansas at Little Rock

### **Abstract**

This phenomenological study examined lived experiences of learning communities among pre-service teachers within online undergraduate college courses. Online learning continues to grow rapidly in higher education. As institutions of higher education develop online courses and students participate in those courses, various issues arise: retention rates, feelings of isolation, and a decrease in feelings of success. Learning communities can combat these issues, but they must first be effectively implemented. This study addressed participants' common lived experiences of learning communities. To collect data, the researcher conducted three in-depth interviews with each of the 12 study participants. Based on these interviews, online undergraduate pre-service teachers' lived experiences of learning communities in their online college courses were relationship-based.

### **Introduction**

As online learning continues to gain popularity (Allen & Seaman, 2010; Allen & Seaman, 2016; Yuan & Kim, 2014), institutions of higher education, as well as K-12 educators, are tasked with creating spaces where learning can flourish. Due to the important role of learning communities; the increase of online learning and its impact on higher education; and the important role of learners' perceptions, the author designed a phenomenological study to gain insight into common lived experiences of learning communities among pre-service teachers within online undergraduate college courses. The data were derived from a broader phenomenological study which implemented in-depth interviews to examine undergraduate pre-service teachers' perceptions of learning community. The data identified three sources in which learning communities were generated within online settings. This article describes the second identified source: online learning communities are relationship-based. Beins (2016) stated, "online instructors must recognize that a learning community is not just a cognitive environment but also a social one" (p. 160). Growing social relationships with classmates in an online class became more than holding conversations with peers; it was using tools to communicate with and understand one another, and it was creating an online presence for oneself, which ultimately conveyed each unique learner's personality and helped foster growth of learning communities.

### **Literature Review**

Research indicates that community is pivotal to human experiences. For example, Maslow (1954), in his work regarding humans and motivation, studied community; however, his work focused on community as the need to belong. Doolittle and MacDonald (1978) developed the Sense of Community Scale, which focuses on community in relationship to communication. Additionally, Conrad (2005), in her work regarding community and an online cohort of students, defined community as "a general sense of connection, belonging, and comfort that develop over time among members of a group who share purpose and commitment to a common goal" (p. 1). Not only does community formation enhance collaboration, it has also been found to increase engagement and feelings of satisfaction within a group atmosphere. When group members feel satisfaction within their group, they may become more motivated to contribute and work with

colleagues. In their work examining academic service-learning, researchers Darby et al. (2013), found that students' motivation increased when they enjoyed their experiences, formed relationships, and felt a sense of responsibility to their learning community. Maslow further explored the sense of belonging to a community and human motivation.

Maslow (1954) developed the theory of human motivation. His work was influential in describing how to best construct the foundation to properly fuel the development of human beings. Maslow's work defined five basic needs that all human beings strive to acquire: physiological needs, safety and security, the need to belong and experience affection, respect and self-respect, and self-actualization. This hierarchy of needs is applicable to community formation in both offline and online spaces. For the purpose of the broader study, the focus remained on Maslow's third defined need, the need to belong and experience affection, which speaks to the importance of belonging to a group. Maslow stated the following about the third need: "Any good society must satisfy this need, one way or another, if it is to survive and be healthy" (p. 44). When considering community formation, if a person does not feel like he or she belongs, his or her participation in the community will falter. Additionally, if other participants experience the same lack of belongingness, the community could experience failure.

Numerous studies show that learning communities play a vital role in online educational spaces (Cleugh, 2013; Jeong & Hmelo-Silver, 2016; Kozlov & Große, 2016). Learning communities provide a space for collaboration to occur, which positively impacts student learning (Cleugh, 2013; Luo et al., 2017). This collaboration among members in a learning community occurs in various ways, relying on multiple modes and tools. When learning communities are successfully generated, there is an increase in the effectiveness of the learning environment (Kucuk & Sahin, 2013).

In an educational setting, the experience of learning communities is important to students' success as well as feelings of satisfaction toward courses. The development of learning communities remains an essential feature of the classroom, either offline or online. Within the classroom setting, learning communities serve as support systems, safe spaces for experimentation and exploration, relationship builders, spaces to create, and places to engage in dialogue.

To gain an understanding of undergraduate pre-service teachers' common lived experiences of learning communities in online college courses, this study was guided by the following research question: What were the lived experiences of learning communities in online courses among undergraduate pre-service teachers from a new literacies perspective? Additionally, the following sub-questions were used:

1. How did participants experience learning communities in school as they were growing up?
2. How did participants experience learning communities in school as an adult?
3. How did participants experience online courses?
4. How did participants experience learning communities in their online courses?
5. Given what participants said about taking an online course and what they said about learning communities, how did they understand community in their online courses?

### **Methods**

The author's phenomenological study was largely based on work by Moustakas (1994), Vagle (2014), and van Manen (1990), which relied on data collection and synthesis to generate meaning about the phenomenon of participants' experiences of online learning communities.

The participants in this study were undergraduate pre-service teachers attending one university in the Midwest. At the time, the author was an adjunct professor at the university. The author relied on a method of sampling known as the snowball effect (Creswell, 2007), where current students passed on her contact information to other undergraduate pre-service teachers who might be interested in participating in the study. Measures were taken to ensure none of the participants would have the author as an instructor as she taught courses which occurred at the beginning of the teacher education program and participants were advanced in their program of study. Participants were gathered from a wide variety of courses and backgrounds, but all were undergraduate pre-service teachers.

The study included four phases: Orientation and Review, Connecting with Participants, Emergent Themes, and Interpretations and Conclusions. The purpose of the first phase, Orientation and Review, was to gain information about and become familiar with possible participants, the phenomenon being studied, and the site in which the study took place. Phase Two, Connecting with Participants, consisted of communicating with participants. During this time, participants signed and returned consent forms and filled out a brief information sheet. The author also began scheduling interviews with participants and building rapport with each of them through email or phone conversations. The third phase, Emergent Codes and Themes, consisted of initial data analysis. Each interview was transcribed in its entirety by the author. Once an interview was transcribed, initial codes and themes were noted. A research journal was used after each interview to record the author's thoughts, wonderings, and possible biases. These notes were used as a guide in future interviews and were also reviewed by two colleagues who served as member checkers throughout the entirety of the study. During Phase Four, Interpretations and Conclusions, emergent themes and codes were organized. The author conducted four rounds of analysis, which is explained below. There was overlap between phases of this study as data collection and analysis occurred simultaneously.

Data collection for the study included three in-depth interviews. The first interview focused on the life history of the participant. The second interview focused on the details of the experience. The third and final interview provided a space for participants to reflect on their experiences with the phenomenon and make meaning. The interviews were structured and conducted synchronously over the phone, as preferred by each participant. Each interview was recorded and later transcribed by the author. The author relied on transcripts and a research journal to collect data. Data analysis of the phenomenology consisted of constant comparative analysis (Vagle, 2014), which afforded the author to collect data and perform analysis simultaneously. Conducting analysis in this way assisted in reaching redundancy. After conducting and transcribing eight interviews, common themes regarding lived experiences of learning communities began to take shape. As coding of common themes continued, three main findings surfaced: learning communities are generated by communication, relationship-based, and technologically bound. The author's main goal for data analysis was to reach redundancy. Findings from this study were confirmed after 10 participant interviews and reached redundancy with the completion of interviews 11 and 12.

## **Results**

Participants revealed various ways in which they experienced learning communities through relationship-building. These included discussion boards, offline and online personalities, emotional support, types of learning opportunities, and face-to-face interactions. Through each of

these, participants were able to form relationships with both fellow classmates and instructors, which ultimately led to feelings to community within their online courses.

Additionally, participants shared 'Wish List' items that they wished were more prevalent in their online courses. Most of the characteristics of these items focused on improved peer interaction. Whether using technological tools or meeting face-to-face, participants desired more interaction with their peers. Multiple participants suggested the idea of in-person study groups, where classmates would meet outside of class to discuss course content, address any concerns, receive feedback, and even simply share resources and personal experiences. Along with face-to-face meetings, three participants suggested the use of various technological tools which would allow students to communicate and build relationships more easily, which they felt might help nurture learning communities. These ideas, which are addressed later in this section, included ways to communicate and work together in real time, such as using a chat room or video-conferencing tools.

### **Discussion Boards: Authenticity?**

The use of discussion boards remained an integral piece of each finding, but the role of discussion boards was different based on how students explored these boards. Sarah and Skyler spoke of their fondness for discussion board posts that felt like genuine conversations. Sarah shared that when classmates responded to her threads with posts that prompted her to reply to them, she felt as if she was participating in a real conversation and building relationships, which she found to be beneficial. Sarah disclosed that conversations such as those made her feel connected. As mentioned previously a connection is an integral piece of relationship building, which was a major finding regarding learning communities. Sarah said,

Because otherwise you're just kind of...you know...on your own and you could feel lost. You kind of get to know each other during the discussion boards; I would even feel comfortable emailing someone that I talked to on the discussion boards before, so yeah I think that [learning community] is important, it just helps you be sure about what you're supposed to read what you're supposed to do, you know, and you can get help from one another. (Sarah, interview 3)

Skyler echoed Sarah's thoughts about using discussion board posts to engage in conversations to build relationships with classmates in order to grow learning communities. Additionally, Skyler explained how discussion board posts helped him share about himself while also allowing him to learn more about his classmates. He said, "I have experienced learning community in online courses through discussion boards and sharing/reading varying opinions. Opinions are a big part of building community. They give you different viewpoints and let you discuss things" (Skyler, interview 2). Both Sarah and Skyler shared the importance of discussion board use for building learning communities. Not only did discussion boards allow Sarah and Skyler to share and learn about course content, discussion boards also created a space where they felt they could build relationships with classmates. While some participants found discussion boards helpful in building relationships, Beth did not agree. She said, "You're supposed to (experience community) with discussion boards, but it's arbitrary. Everyone just says the same thing" (Beth, interview 2). Beth continued on to describe how she experienced classmates repeating what their textbook stated and not sharing their own opinions. Due to this experience with discussion boards, Beth did not feel as if they helped grow relationships and establish learning community.

### Offline and Online Personalities

As participants divulged information about their experiences with online courses and learning communities, the topic of personalities became another common theme. Developing a personality in one's online course assisted participants in experiencing learning communities because they felt as if they were learning from and alongside real people. Participants expressed that online personalities assisted in making them feel less isolated in their online courses, which added a layer of support to their learning, though they understood that altering one's personality in an online course could occur.

Participants found it important to create their own social presence online because of the nature of their learning environment and to help grow learning communities. Participants desired to be seen as real persons behind their screens. While participants wished for this recognition for themselves, they also desired to understand their classmates' personalities as well. Sarah and Skyler shared their desire to come across as "friendly" (Sarah, interview 2; Skyler, interview 2). Sarah said, "I try to come across as friendly in my posts; I also try to get to know my classmates and talk about things that might interest them" (Sarah, interview 2). Sarah felt the addition of informal conversation to her own posts added a layer of connectedness within her online courses. Furthermore, Skyler admitted he tried "to be positive and encouraging in my comments. I like to be friendly" (Skyler, interview 2). Both participants believed these behaviors added enjoyment to their online courses.

While Sarah and Skyler conveyed being friendly added experiences of learning community and built relationships in their online courses, Heath, Beth, Lucy, and Sally felt knowing a classmate from a seated course before working with him or her in an online course helped create experiences of learning communities and build relationships. Lucy explained, "If I'm in a class with someone I already know, I collaborate with them, so that's building [learning] community, not necessarily with the rest of the class, but with our small group, and I definitely feel more connected" (Lucy, interview 2). Likewise, Beth shared that if she knew a classmate in an online course from a seated course they had had together, she would be more willing to reach out and contact them than if they were 'meeting' for the first time in the online course. While it is not always possible for students in online courses to know their classmates ahead of the course start date, these participants had experienced those types of learning environments and felt they benefited from them.

Another way in which participants sought to build relationships and form learning communities in their online courses was by sharing personal information. Lucy mentioned she preferred to "add personality to posts" because it "makes things more personal" (Lucy, interview 3). Lucy determined that by adding her own flare to posts and assignments, her classmates might feel more connected to her as a person. Sally echoed this sentiment, sharing her desire for all online instructors and students to share photographs of themselves. She experienced this in a few of her online courses, noting it was beneficial for building learning communities. Sally disclosed, "I like being able to put a face with a name, I wish that that was mandatory. I keep thinking I'll update my own profile...I think I had a picture at Outward Bound Community College, but I don't think I have one for Twin Lakes University. But that kind of gives me a sense of security, too, just knowing who I'm speaking to. (Sally, interview 3).

Similarly, Cathy found that in her online courses when instructors would record and post videos, it helped when they embedded their voices into each video. Cathy shared it was not only helpful for the learning process, but it also made her feel like she knew the instructor a better; it

“made them [sic] a real person” (Cathy, interview 3). Adding voice to videos helped create an online persona for these participants’ instructors, which better helped them establish a relationship and feel a connection. Rory similarly expressed,

I have experienced [learning] community in an online course, but I almost have to find it, if that makes sense. I have to find the personality of that individual while I’m reading their um, posts, or even just trying to find their personality to reply to whatever assignment I’m trying to do for the course. To add voice...where I wouldn’t be able to do that necessarily if I was turning something in for a seated course. So, um, I guess...finding a voice to, therefore, have [learning] community in an online course is the only way I think I would find community in it. (Rory, interview 2).

Despite participants desiring the development of personalities in their online courses, Steph and Sonya shared concerns about the creation of fake personalities online. Steph had encountered courses where she recognized her own posts were being influenced by what her peers were posting. She wondered if others felt that way and altered what they said based on posts made by others in order to fit in better. Steph admitted at times her classmates appeared to be influenced by what others said, and rather than speaking their own truth, they might alter their post in order to avoid offending someone. “It’s easy to hide behind a screen” (Steph, interview 3), she disclosed. Sonya’s concern also addressed “imitated community” (Sonya, interview 2). Sonya claimed that online courses “can feel like an imitated learning community. It feels like there should be some [community] with discussion boards, but people don’t really care. You can tell by their short responses” (Sonya, interview 2).

### **Emotional Support**

Another characteristic of online learning communities being relationship-based was emotional support. Participants experienced learning community among their classmates when they felt supported in their learning. This emotional support manifested itself in various forms. Participants addressed the importance of trust, honesty, friendship, voice, validation, and connectedness. As participants experienced these feelings in their online courses, they felt supported by their classmates and their instructors, which positively impacted their experiences of learning communities. Sally found trust at the forefront of her experiencing feelings of emotional support within her online courses. She urged other students to “be open and honest; don’t hide behind the keyboard or monitor” (Sally, interview 3). Sally said she worked hard to be honest in her own postings, and when she felt that other students were also being honest, she felt the most supported in her learning. Additionally, Skyler believed learning communities could be created by “making everyone feel connected. Classrooms are their own learning communities, people become friends” (Skyler, interview 2). Sonya echoed Skyler’s beliefs about feeling connected to a course. Likewise, Sonya shared that one of the benefits of feeling those connections might include being comfortable enough to contact fellow classmates to ask for help, clarification, or just to talk with them. Lilly and Skyler confessed receiving feedback and hearing validation from both classmates and instructors for their work was an important component of support, relationship building, and establishing learning communities, as those areas provided guidance and created feelings of understanding within their online learning space. In receiving feedback and validation, both felt supported in their learning and that they were part of a community of learners. Similarly, Adam, Sonya, Heath, and Sally acknowledged that establishing learning communities through emotional support created an attachment to the class



for each of them. This support helped alleviate feelings of isolation online learners can experience.

### **Types of Learning Opportunities**

A third component of learning communities being relationship-based included types of learning opportunities in which these participants partook. These learning opportunities stemmed from group work where participants felt validated in their learning while gaining exposure to different viewpoints. These opportunities helped establish feelings of learning communities within participants' online courses.

#### ***Group work***

Group work stood out as a major factor in establishing relationships within learning communities. These participants shared that when online instructors put them into small groups rather than keeping the class as a whole group, they felt the most learning community. Sarah and Sally both spoke about how when these small groups were implemented, they became acquainted with the other students in their small group. Not only was it more manageable to read every post by group members, but they found students within their groups shared more personal information and experiences than students tended to do when left to communicate using the whole class discussion board. Sally discussed one online course she had taken where the instructor had assigned a personality test as a way to determine small groups. Sally loved being grouped in this way because she was able to work with like-minded people in a small, manageable group, which she found to be beneficial to her learning. "You really go in-depth, you could sit down and it was logical to think you could read six classmates' opinions rather than the whole class" (Sally, interview 3). Moreover, Steph and Skyler shared their fondness for small group projects, where they felt safe to share their own opinions and work with other students.

Heath and Steph suggested these small groups of students not only influenced the learning communities they experienced, but the small groups increased their own accountability to finish and submit assignments in a timely manner within online courses. Both participants recognized when working in small groups, they were more likely to turn assignments in on time because they knew each of their small group members were depending on them. Similarly, Lucy commented on the importance of collaboration, which she believed groups afforded students. Lucy stated, when working collaboratively in small groups, "we can use each other's brains to complete the best work together. Community is supporting one another, circulating the power, and challenging one another" (Lucy, interview 3). Participants' comments about group work advocated learning communities were fostered when they felt supported and validated within their small groups. These groups provided a safe space for exploration and learning to occur within the online learning context.

#### ***Content conversations***

Lucy and Heath reported they retained more information from their courses when they were able to talk about what they were learning. Heath said he was more invested in his classes when he was able to discuss concepts with his classmates and teachers. Both Lucy and Heath acknowledged they learned significantly from these conversations with their classmates and teachers, which also helped establish a strong sense of learning community in their online courses.

### **Face-to-Face Interaction**

Lastly, as participants continued to describe ways in which they experienced learning communities through relationship building in their online courses, the topic of human interaction surfaced. Participants were passionate about seeing their classmates in person, while acknowledging that this one-on-one meeting did not need to happen every week. The participants shared that when they experienced face-to-face time with classmates or instructors, they felt more connected to their classmates when they returned to the online portion, which positively impacted their experiences of learning communities in their online courses. While Cathy and Lucy expressed their fondness for blended courses, in which students meet online as well as on campus in a classroom, they said simply meeting with their classmates outside of their online course was beneficial. This meeting helped bond both women to their classmates and better recognize who the person was they were communicating with within their online learning environment. Heath supported the idea of meeting with classmates face-to-face. He acknowledged those interactions truly helped build learning communities and foster relationship formation, which positively impacted students in their online courses.

Generally, most participants agreed relationships were important in any learning environment. Despite their importance, Sally and Sonya spoke of difficulties they encountered when attempting to build these relationships. Sally disclosed her frustration when attempting to reach out to other students in her online courses. She explained not everyone sought after the same learning outcome in an online course, and if students were just there to do the bare minimum and be finished, they would not desire to build a relationship with any other students. Sally is a nontraditional student and shared that perhaps she felt this way because she returned to school at an older age. According to the National Center for Education Statistics (n.d.), a nontraditional student is categorized as someone who is typically over the age of 24, often has family and work responsibilities, might not live on campus, and/or has a full-time career (Who is Nontraditional section, para. 1). Additionally, Sonya spoke of a concern regarding her own experiences with online courses. Sonya echoed some of Sally's concerns about students not necessarily craving the establishment of learning communities and building relationships. She felt frustrated with students such as these when she encountered them in her own courses.

Sonya disclosed she feared only creating relationships with her instructors when taking online courses. While she found those relationships to be beneficial, Sonya wished she could build strong learning communities and establish relationships with her classmates in all of her online courses. Despite these concerns, participants valued the relationships they built in their online courses and found them to be beneficial in their own learning.

### **Participant Wish Lists**

Most of the relationship-based characteristics for experiencing community focused on improved peer interaction. Whether using technological tools or meeting face-to-face, participants desired more interaction with their peers. Heath, Lilly, and Rory suggested the idea of in-person study groups, where classmates would meet outside of class to discuss course content, address any concerns, receive feedback, and even simply share resources and personal experiences. Lilly stated, I wish online classes were set up more like seated courses, where we could meet up with the instructor and/or other classmates occasionally. I'm just such a social person that sometimes I want to be able to see and speak with real people, not just through the computer screen. (Lilly, interview 3)

In addition to face-to-face meetings, Heath, Cathy, and Sonya suggested the use of various technological tools which would allow students to communicate and build relationships more easily, which they felt might help nurture learning communities. Heath and Cathy proposed the idea of a chat room, where students could talk with one another in real-time. Similarly, Sonya focused more on video-conferencing tools, suggesting the use of Skype as a group, where students could communicate and work together.

### **Implications**

As online learning continues to become a more popular option (Allen & Seaman, 2010; Allen & Seaman, 2016; Cleugh, 2013; Picciano et al., 2010; Yuan & Kim, 2014), participants desired a sense of connection to classmates and instructors in their online learning environments. These connections, or relationships, which assisted in establishing learning communities, can be developed in a variety of ways. Participants addressed four areas in which learning communities were fostered as they formed relationships with peers and instructors. The first area consisted of discussion board use. Participants felt most connected to classmates through in-depth discussion board conversations. In order to continue building relationships and community in this way, implications from this finding suggest course designers and instructors design courses in which students have ample opportunities to engage in authentic dialogue with their classmates. This dialogue should consist of content-based topics as well as informal conversations. It was within these informal conversations that participants felt the most connected to classmates. While engaged in these conversations, students worked to establish their online personalities, which was an additional method used to create a sense of connection and assisted in forming relationships. Seckman (2018) suggested faculty focus on establishing and facilitating activities where students are able to focus on social presence, which aids in relationship building, which ultimately impacts experiences of learning communities.

A second area in which participants considered relationships and learning community could be fostered was through emotional support. Participants felt more connected to their classmates and instructors when they were able to receive validation and feedback for their work. When instructors provided timely feedback—24 hours or less—to students in response to assignments, participants felt they retained more information. Additionally, participants experienced relationship formation through comfortable contact with classmates. The more opportunities participants were given to participate in dialogue with classmates, the more likely they were to reach out and ask for help or engage in informal conversations with their peers, which created learning communities in their online spaces.

A third component which assisted in relationship formation to build learning communities in online classrooms was an exposure to a variety of learning opportunities. When taking an online course, students can experience feelings of isolation (Lichtenstein, 2005). Participants expressed how beneficial the implementation of small group work was as they built relationships and developed learning communities. Within these small groups, participants felt safe sharing about their own learning; whether they posed questions about assignments or concepts or were providing clarification for a peer, participants felt supported within their small groups. Implications from this finding suggest instructors create and encourage work within small groups, those feelings of isolation can be diminished and even eliminated. Participants appreciated how participation in different learning opportunities provided them with a space for exposure to different perspectives. In experiencing different viewpoints, participants reported feeling supported in their learning while gaining new insights into various topics.

Lastly, participants experienced relationships and learning community through face-to-face interaction. While this is not always a possibility for online students, as some are long distance online students, for local online students, it was beneficial. When instructors were able to meet either with groups of students, perhaps for office hours or to go over a difficult concept, students felt a deeper connection to the course. Additionally, instructors can encourage students to meet outside of a course to collaborate with one another. These concepts aided in establishing strong relationships and growing online learning communities.

### **Conclusion**

As participants reflected on experiences of school as children, many had difficulty recalling specific details. The interview questions about this stage of schooling centered on elementary, middle, and high school. Most remembered friendships or disagreements with classmates, but none were able to actively recount working to build a learning community in their classrooms at this age.

As we moved to discussions regarding school experiences as adults, there were more accounts of working to grow community and build relationships with classmates and instructors. These interview questions focused on experiences with learning community in a college setting. Participants shared experiences with seated, online, and hybrid courses. Overall, participants shared experiences of learning community in all three modalities, with a wide range of instances and varying degrees of effort to grow community.

Generally, participants shared positive experiences concerning their online courses. While a few participants shared difficulties they encountered while learning in an online setting, most participants recalled positive experiences and worked to establish relationships with both peers and instructors, especially when in multiples courses with a peer or taking more than one course from a specific instructor. Participants also discussed how their sense of joy and motivation was often impacted by the sense of learning community within online courses. Almost all participants stated that a strong sense of learning community was beneficial for pre-service teachers.

Ultimately, the lived experiences of learning communities among undergraduate pre-service teachers were relationship-based. These relationships were formed between study participants and classmates as well as participants and instructors. Under the umbrella of relationships impacting participants' experiences of learning communities, five themes emerged: (a) authenticity of discussion board posts, (b) the development of online personalities, (c) experiencing emotional support, (d) involvement within various learning opportunities, and (d) face-to-face interactions. Participants conveyed appreciation for online courses that fostered relationship formation, as it positively helped generate learning communities. Through these relationships, participants had more positive experiences with their online learning. Participants also shared their desire to establish personalities online. In developing these online personalities, participants sensed they were learning alongside a real person rather than a robot on the other side of a computer screen. While feelings of disconnect within their online courses led to frustrations among participants, the ability to collaborate in an effective way appeared to combat those negative feelings. Thus, participants believed relationship formation was a positive aspect of online learning communities.

## References

- Allen, I. E., & Seaman, J. (2010). *Learning on demand: Online education in the United States*. Babson Survey Research Group. <http://files.eric.ed.gov/fulltext/ED529931.pdf>
- Allen, I. E., & Seaman, J. (2016). *Grade level: Tracking online education in the United States*. Babson Survey Research Group. <https://www.onlinelearningsurvey.com/reports/gradelevel.pdf>
- Beins, A. (2016). Small talk and chit chat: Using informal communication to build a learning community online. *Transformations: The Journal of Inclusive Scholarship & Pedagogy*, 26(2), 157-175. doi:10.5325/trajincschped.26.2.0157
- Cleugh, C. (2013). *Sense of community in post-secondary online blended courses: Importance of opportunities and implications for course development*. (Unpublished doctoral dissertation). Pepperdine University, Malibu, CA.
- Conrad, D. (2005). Building and maintaining community in cohort-based online learning. *Journal of Distance Education*, 20(1), 1-21. <https://files.eric.ed.gov/fulltext/EJ807822.pdf>
- Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five traditions* (2nd ed.). Thousand Oaks, CA: Sage.
- Darby, A., Longmire-Avital, B., Chenault, J., & Haglund, M. (2013). Students' motivation in academic service-learning over the course of the semester. *College Student Journal*, 47(1), 185-191.
- Doolittle, R. J., & Macdonald, D. (1978). Communication and a sense of community in a metropolitan neighborhood: A factor analytic examination. *Communication Quarterly*, 26(3), 2-7. <http://dx.doi.org/10.1080/01463377809369297>
- Jeong, H., & Hmelo-Silver, C. E. (2016) Seven affordances of computer-supported collaborative learning: How to support collaborative learning? How can technologies help? *Educational Psychologist*, 51(2), 247-265. doi:10.1080/00461520.2016.1158654
- Kozlov, M., & Große, C. S. (2016). Online collaborative learning in dyads: Effects of knowledge distribution and awareness. *Computers in Human Behavior*, 59, 389-401. <http://dx.doi.org/10.1016/j.chb.2016.01.043>
- Kucuk, S., & Sahin, I. (2013). From the perspective of community of inquiry framework: An examination of Facebook uses by pre-service teachers as a learning environment. *Turkish Online Journal of Educational Technology - TOJET*, 12(2), 142-156.
- Lichtenstein, M. (2005). The importance of classroom environments in the assessment of learning community outcomes. *Journal of College Student Development*, 46(4), 341-356. doi:10.1353/csd.2005.0038
- Maslow, A. H. (1954). *Motivation and personality*. New York, NY: Harper. [http://s-f-walker.org.uk/pubsebooks/pdfs/Motivation\\_and\\_Personality-Maslow.pdf](http://s-f-walker.org.uk/pubsebooks/pdfs/Motivation_and_Personality-Maslow.pdf)
- Moustakas, C. (1994). *Phenomenological research methods*. Thousand Oaks, CA: Sage.
- Picciano, A. G., Seaman, J., & Allen, I. E. (2010). Educational transformation through online learning: To be or not to be. *Journal of Asynchronous Learning Networks*, 14, 17-35. <https://files.eric.ed.gov/fulltext/EJ909909.pdf>
- Seckman, C. (2018). Impact of interactive video communication versus text-based feedback on teaching, social, and cognitive presence in online learning communities. *Nurse Educator*, 43(1), 18-22. <https://doi.org/10.1016/j.iheduc.2017.05.001>
- Vagle, M. D. (2014). *Crafting phenomenological research*. Walnut Creek, CA: Left Coast Press, Inc.

- van Manen, M. (1990). *Researching lived experience: Human science for an action sensitive pedagogy*. Ontario, Canada: University of Western Ontario.
- Yuan, J., & Kim, C. (2014). Guidelines for facilitating the development of learning communities in online courses. *Journal of Computer Assisted Learning*, 30(3), 220-232.  
doi:10.1111/jcal.12042

## **Deepening Learning in Teacher Education: A Framework of Professional Praxis for Teacher Candidates**

Lydia Brauer, Arkansas Tech University  
Jan Westrick, Valparaiso University

### **Abstract**

Research indicates that competence in a given field depends on a solid foundation of knowledge organized around a conceptual framework in ways that facilitate retrieval and use. While the knowledge base of teaching and learning is organized for teacher education in a framework that represents the “what” of teacher education, this framework’s relevance for candidates is limited. The literature suggests criteria that can guide the development of a Professional Praxis Framework designed for use with and by teacher candidates. This paper also presents examples of its use by teacher educators to demonstrate how a conceptual framework designed for deepening candidate learning through a dialogic learning environment can model and prepare them to teach their students for deeper learning.

### **Introduction**

Promoting deeper learning to prepare today’s students to meet the challenges of the future depends on their teachers’ understanding of and skills for creating challenging, engaging, and innovative learning experiences that make “content knowledge generative and transferable” (Darling-Hammond and Oakes, 2019, 5). This magnifies the already challenging work of teacher educators because candidates enter their preparation programs with a dearth of deeper learning experiences themselves, having spent their entire education in “passive, rote-oriented learning, (the) dominant practice (in schools) today” (Darling-Hammond et al., 2021, v.; Darling-Hammond & Oakes, 2019, p. 16).

Research indicates that competence in a given field depends on a solid foundation of knowledge organized around a conceptual framework in ways that facilitate retrieval and use by those building that competence, so it follows that if teacher educators can conceptualize the work of teaching for deeper learning and enact deeper learning experiences with candidates drawn from that conceptualization, they can scaffold the development of candidates’ competence to enact deeper learning in their future classrooms.

This paper examines this dual challenge – how teacher educators can conceptualize teaching for deeper learning in a program framework and how they can construct deeper learning experiences for their own classrooms using that framework. We first present a brief review of the literature on professional frameworks and a discussion of the Knowledge, Skills, and Dispositions for Teaching: The “What” of Teacher Education as the means for identifying criteria for a conceptual framework for use with and by candidates to deepen their learning. We then present a framework of professional praxis based on those criteria along with instructional strategies for teacher educators’ use that foster and model a dialogic learning environment to develop professional competence.

## Review of Literature

### Professional Frameworks

The role of conceptual frameworks in professional education is not new nor is their benefit to learning, teaching, and scholarship. The National Research Council (2000) found that “considerable research on learning indicates that competence in a given area depends on having a solid foundation of factual knowledge organized around a conceptual framework and held in ways that facilitate retrieval and use” (Feiman-Nemser, 2008, p. 699). Such frameworks, “conceptually organized, represented and communicated... (can) encourage beginners to create deep understandings of teaching and learning” (Barnes, 1989, p. 17), leading to increased professional competence, “a sense of purpose and efficacy” (Darling-Hammond et al., 2021, pp. 4-5), and the generalizability and transferability of professional knowledge.

Even very recently, leading scholars identify teacher education’s “failure to organize the knowledge base in a manner that can be readily accessed and deeply understood by practitioners and their preparers” (Darling-Hammond et al., 2021, p. 1). Theoretical frames are useful by “categorizing, interpreting, and ultimately explaining what happened and why” (Hoy, 2000, p. 267). While candidates in most programs now spend a good deal of time in clinical settings, without such a framework, they likely have “plenty instances of teaching to reflect on but little to reflect with” (Hoy, 2000, p. 267).

The Darling-Hammond and Oakes study of seven exemplar teacher preparation programs reveals that while they have considerable differences, “they (all) share a deep structure shaped by their common understanding of how people learn and their common commitments to a just society that focus them squarely on preparing teachers to teach diverse learners equitably” (Darling-Hammond & Oakes, 2019, p. 4). For a framework to deepen candidate understanding then, it should therefore make visible a structure for categorizing, interpreting, and explaining the teaching profession that centers the research on student learning and development along with the field’s commitment to enacting equity in schooling.

As teacher educators we want to support candidates to hold their knowledge conceptually “in ways that facilitate retrieval and use” (Feiman-Nemser, 2008, p. 699). We assume that a professional framework, designed for use by candidates, could support them as they learn to “interpret and organize their insights about students and to sort out the implications for teaching” (Feiman-Nemser, 2008, p. 701). Ideally, the framework itself could support candidates’ organization of their thinking, scaffold interpretations of learning experiences, and make connections to teaching decisions. Such a framework could, by design, lead to greater transferability and generativity of the knowledge base of the teaching profession, the ultimate goal of retrieval and use. The literature provides guidance to achieving these goals through deeper learning of candidates.

First, frameworks should help candidates “identify and question their assumptions about learning... and organize their own inquiry process” (Bransford et al., 2005, p. 79). By facilitating an inquiry stance in their profession, an effective framework for candidates would scaffold the kind of professional inquiry that underlies the work of teaching for deeper learning and equity. Second, Loughran reminds us that teacher educators need to help candidates uncover teaching as “problematic in such a way as to illustrate what they know, how they know it, why it matters and what it looks like in practice” (Loughran, 2008, p. 1181). When candidates grapple with the problematic nature and complexities of teaching, their own learning is deepened. A conceptual framework that makes these realities visible and acknowledges their influence on the work of teachers provides a mental schema to guide their thinking and analysis.



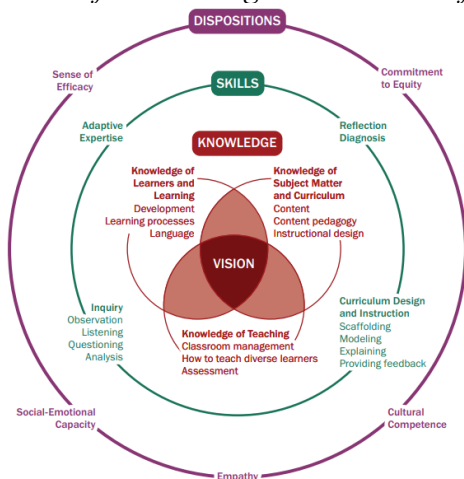
The literature on professional frameworks suggests the following criteria for a framework that deepens teacher candidates' learning: it is based on knowledge of how people learn and develop; it is centered around the teaching profession's commitment to and enactment of equity in schooling; it represents and organizes the field's factual knowledge conceptually in ways that support their deep understanding of teaching and learning; it guides candidates to develop an inquiry stance toward their students and sort out the implications for effective teaching and learning; and it prompts candidates to explore the problematic nature of and complexities inherent in teaching.

### The Framework for Understanding Teaching and Learning for Teacher Educators

In Figure 1, the Framework for Understanding Teaching and Learning (Darling-Hammond et al, 2021, p. 10) identifies three domains of the knowledge base of teaching and learning: knowledge of learners and their learning, knowledge of subject matter and curriculum goals, and knowledge of teaching. The framework identifies the underlying structures of teaching and their relationships to each other, with the center overlap being a vision of professional practice. This framework refines its prior versions (Bransford & Darling-Hammond, 2005; Darling-Hammond, 2006, p. 84; Darling-Hammond & Oakes, 2019, p. 54) by incorporating recent research on the importance of cultural competence and socio-emotional capacity of teachers. As its title states, this framework shows the “what” of teacher education; as such, it reflects the point of view of teacher educators.

#### Figure 1

*Knowledge, Skills and Dispositions for Teaching: The “What” of Teacher Education*



The “Vision” label at the center of this framework aptly describes the overlap of the three domains of teaching as a profession but what that vision looks like is not explicitly stated. The Skills and Dispositions components do, however, describe what teachers need to be disposed to do when teaching for deeper learning, quality, and equity: dispositions of efficacy, equity, socioemotional capacity, empathy, and cultural competence; and skills of adaptive expertise, reflection and diagnosis, inquiry, and curriculum design and instruction. Because the Dispositions articulate what teachers should be like and the Skills that teachers should be able to

do, the “dispositions unite ability with desire” and “orient teachers to act in particular ways” (Feiman-Nemser, 2008, p. 699).

Inquiry and Reflection, listed as Skills in the Darling-Hammond framework (2021), could arguably be considered as necessary companions to the four dispositions. For example, how could teachers live out a commitment to equity without inquiring into and reflecting on sociocultural influences on their students or on whether all students are deeply learning? Candidates who develop strong skills of inquiry can apply them to multiple challenges of teaching; thereby they become predisposed to delving deeper into those challenges as a regular feature of their professional praxis. This, in turn, further enhances their skills of adaptive expertise to the point at which adaptation becomes part of who they are as teachers, perhaps in a positive, self-reinforcing way. Naming and making visible this interplay of Skills and Dispositions as the vision at the center of a framework for candidates could focus and deepen their learning across their academic and clinical experiences.

This review of the Framework for Understanding Teaching and Learning suggests another criterion for a framework for teacher candidates: specify the vision of professional practice to capture the essence of how dispositions orient teachers to act in particular ways.

In sum, the criteria identified for a framework that deepens the learning of teacher candidates would

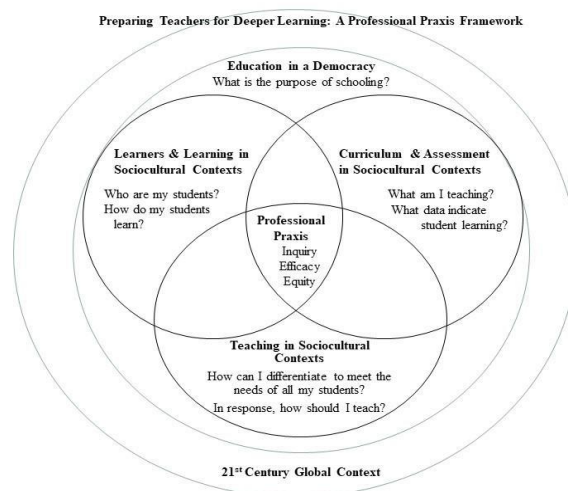
1. be based on knowledge of how people learn and develop
2. be centered around the teaching profession’s commitment to and enactment of equity in schooling, and
3. represent and organize the field’s factual knowledge conceptually in ways that support novices’ deep understanding of teaching and learning
4. guide candidates to develop an inquiry stance toward their students and sort out the implications for effective teaching and learning,
5. prompt candidates to explore the problematic nature of and complexities inherent in the three domains: learners and learning, curriculum, and teaching
6. specify the vision of professional practice to capture the essence of how dispositions orient teachers to act in particular ways.

### **A Framework for Deepening Learning of Teacher Candidates**

Building from the six criteria identified in the literature, we now discuss a framework for preparing teachers for deeper learning designed to be used by teacher candidates as they progress through their preparation programs. The Professional Praxis Framework, like the Knowledge, Skills, and Dispositions for Teaching model (Darling-Hammond, et al, 2021) begins with how people learn and develop (Criterion 1) and overlaps with the knowledge domains of curriculum, assessment, and teaching which are in turn part of the larger contexts of a changing world and learning in a democracy.

The Professional Praxis Framework defines the vision of teacher preparation as one of professional praxis characterized by candidate dispositions focused on inquiry, efficacy, and equity (Criterion 6). As a means to further make visible the intellectual and ethical work of teaching and deepen candidate learning, the Professional Praxis Framework introduces Essential Questions and Dialogic Tensions (Criteria 4 and 5). As a whole, this model represents and organizes the field’s factual knowledge conceptually (Criterion 3) and highlights the profession’s commitment to the dispositions and actions related to equity, inquiry, and efficacy (Criterion 2).

**Figure 2**  
*The Professional Praxis Framework*



### **Sociocultural Contexts in All Knowledge Domains of Teaching**

By situating all three domains of teaching within sociocultural, global, and democratic contexts in the Professional Praxis Framework, we highlight for candidates the responsibility of educators to integrate these realities into all components of their professional praxis. Previous models placed “in sociocultural contexts” only in the Learners and Learning domain of the knowledge base of teaching (Darling-Hammond and Bransford, 2005; Darling-Hammond, 2006). The Professional Praxis Framework intentionally names the relevance of sociocultural contexts to Curriculum and Assessment and to Teaching as well, particularly because candidates likely retain misconceptions from their own schooling that curriculum, assessment, and teaching practices exist outside of the contexts in which their students are situated. This prompts them “to broaden and make problematic their notions about social contexts and how these contexts interact with students’ backgrounds, characteristics, and needs” and should influence candidates’ decisions about curriculum, instruction, and assessment (Darling-Hammond, 2006, 233).

Stating the sociocultural contexts in the Curriculum & Assessment and Teaching domains supports candidates’ unpacking of assumptions about their students and the biographical, cultural, and linguistic influences on their learning. For example, in the Disciplinary Literacies course, candidates read James Gee’s *What is Literacy?*, Lisa Delpit’s *Acquisition of Literate Discourse: Bowing Before the Master?*, and Timothy & C Shanahan’s *Teaching Disciplinary Literacy to Adolescents: Rethinking Content Area Literacy?* to learn whose voices and presence are included and excluded in subject areas and about how their own education has been shaped by class, power, gender, and economics as it will for their future students.

Later, in the English Language Learning Methods course candidates analyze the demographic trends of the U.S. school population and research the history and cultural beliefs and practices of the major linguistic groups in their state prior to differentiating a unit plan and assessments they designed in a previous course. Their revised unit plan incorporates instructional

and assessment strategies that are more responsive to students' lives and tailored to their English skill levels in ways that treat their "differences" as assets that help them learn and learn more deeply.

Naming the influence of sociocultural contexts in all three knowledge domains in the framework

prompts candidates to actively apply what they know about their students, their lives, and the curriculum to their daily work in classrooms, challenging them to enact responsive, engaging, and meaningful learning experiences for all students. This also embeds an ecological perspective into candidates' thinking and inquiry, which increases the likelihood that candidates will be able to enact educational quality and equity for all students.

### **The Vision of Professional Praxis**

Labeling the overlap of the three domains as Professional Praxis instead of Vision is a means to make more specific the vision we have for our candidates. It also highlights the importance of connections between theory and practice. Candidates who theorize their practice "understand the practical relevance of theory...so that their actions are grounded and principled" (Darling-Hammond & Oakes, 2019, p.107). In other words, their learning is deepened.

The three dispositions of professional praxis - inquiry, efficacy, and equity - are derived from the skills and dispositions in the Darling-Hammond, et al framework (2021). Taken together, they form an integrated vision of professional practice by describing "what teachers should believe and care about" (McDiarmid & Clevenger-Bright, 2008, p. 134). Situated in the overlap of the three knowledge domains of professional praxis, these dispositions articulate a vision of teachers, who, given the needs of diverse students within democratic and global contexts, would be predisposed to choose actions based on inquiry, efficacy, and equity.

#### ***Inquiry***

Candidates who learn to inquire about their students and actively theorize their practice can develop research-based professional judgment and agency. Building from the research base of how people learn and develop and the data collected in clinical settings, candidates have an informed basis for critical analysis of curriculum, assessment, and teaching practices. For example, when learning about teaching reading while engaged in fieldwork with first graders, elementary education candidates' reference the extensive knowledge base in literacy they learn from their teacher educators, analyze ongoing assessments of students' skill development, and observe the variety of teaching strategies used by their mentor teachers. When this type of integrated learning experience is strategically designed and intentionally placed throughout a teacher education program, candidates can acquire both skills of inquiry and dispositions to inquire about their students and their practice.

The visibility of inquiry as a key characteristic of the vision in the Professional Praxis Framework reminds candidates of its integral nature to effective teaching practice. Darling-Hammond and Oakes (2019) point out that candidates

must be able to understand concepts deeply enough and have sufficiently developed inquiry skills that they can seek out, understand, and combine knowledge in many ways, and can apply what they know to novel, complex problems in different real-world situations. This means that they need to learn in ways that make content knowledge generative and transferable.

When teachers believe in and care about inquiry as a component of professional praxis, they develop a disposition to do it naturally. Inquiry thus becomes both a stance of professional praxis (an orientation to act in particular ways) and a warrant (a criterion through which to evaluate professional decisions).

### ***Efficacy***

Relatedly, efficacy results from the active, intentional theorization and evidence-based analysis of Learners and Learning, Curriculum and Assessment, and Teaching in sociocultural contexts.

Research suggests that teachers with higher levels of efficacy produce higher levels of learning (Darling-Hammond, 2006). Efficacious teachers choose instructional strategies that are more likely to make content knowledge generative and transferable. They use more efficient classroom management strategies. They enhance their efficacy as instructors by attending professional development events and asking students for feedback. Finally, they expend more effort and display more persistence in their quest to ensure that all students in their classes are motivated to learn and successful.

Professional praxis includes more than a commitment to the learning of all students; teachers need to believe in, care about, enact, and evaluate the efficacy of their practice so that all their students are learning deeply. Together with inquiry, efficacy becomes both a stance of professional praxis (an orientation to act in particular ways) and a warrant (a criterion through which to evaluate professional decisions).

### ***Equity***

Finally, and perhaps most significantly, is the question, “How can we prepare those who enter the profession to teach for deeper learning - and in doing so, to teach for equity and social justice as well?” (Darling-Hammond and Oakes, 2019, p. 4). Instruction, curriculum, and schooling needs to be informed by a commitment to equity and informed actions that decrease inequities and enhance equity. Instruction should fairly and equitably address the learning needs of all students. Curriculum should equitably represent a range of perspectives, identities and communities. Schools must offer equitable opportunities for education; they need teachers who inquire into inequitable circumstances and outcomes and provide leadership to reduce them.

Professional praxis includes more than a commitment to the learning of all students; teachers need to actively pursue the enactment of equity in their classrooms and schools using their understandings and skills of inquiry and efficacy. Like inquiry and efficacy, equity becomes both a stance of professional praxis (an orientation to act in particular ways) and a warrant (a criterion through which to evaluate professional decisions).

## **Deepening Understanding Through Essential Questions and Dialogic Tensions**

With the goal of deepening candidate learning and facilitating the transferability and generativity of professional content knowledge, the Professional Praxis Framework introduces seven Essential Questions of teaching, each associated with Dialogic Tensions (Darling-Hammond & Oakes, 2019). We discuss first the essential questions and examples of their use by teacher educators to deepen candidate learning.

**Figure 3***The Essential Questions of Professional Praxis***Essential Questions**

---

What is the purpose of schooling?

---

---

Who are my students?

---

---

How do my students learn?

---

---

What am I teaching?

---

---

What data indicate student learning?

---

---

How can I differentiate instruction to meet  
the needs of all of my students?

---

---

In response, how should I teach?**Essential Questions**

The Professional Praxis Framework uses seven essential questions as a central framing device through which candidates interrogate their learning and practice in the contexts of the three knowledge bases of teaching. By definition, essential questions lay at the heart of a discipline, thus they recur over time (Wiggins, G. P., & McTighe, J., 2011). They drive the thinking and development of a field, meaning that both novices and experts ask the same essential questions, though the level of sophistication of their answers increases as expertise develops.

Darling-Hammond and Oakes (2019) argue that “learning occurs as people try to make meaning of the world and use what they have learned in new situations” (pp 7-8). These essential questions can scaffold such meaning-making and cross-contextual work by candidates because they conceptually organize the factual knowledge of teaching and learning, making more visible the underlying structures and complexities of the teaching profession.

The essential questions also become tools of inquiry by modeling and scaffolding the intellectual labor of teaching. As such, designing a framework for candidates around essential questions signals that inquiry is a key goal of education; it also increases intellectual engagement, provides transparency for candidates, and encourages and models metacognition (McTighe and Wiggins, 2013, p.17).

Answers to essential questions of teaching are inherently complex and situated, but when used in connection with examining authentic problems of teaching and learning, they can encourage “grappling with principles and ideas in collaboration with others, exploring the meaning of new ideas, drawing connections to other ideas, and applying learning to real tasks in which the tools of work are used both to determine patterns and to practice new skills”; indeed, this type of learning leads to effective transfer (Darling-Hammond & Oakes, p. 206). The seven Essential Questions thus scaffold candidates’ inquiry into authentic problems of teaching; they encourage candidates to inquire about, interpret, and organize their insights about students and sort out the implications for effective teaching and learning.

***Pedagogical Uses of the Essential Questions***

For essential questions to lead to deeper learning, they need to be actively wrestled with in the context of compelling content, including making meaning of clinical experiences, as the following examples demonstrate.

“Who are my students?” is introduced in an Educational Psychology course when candidates write a Case Study of an elementary or secondary student. The design of this

assignment leads candidates to realize that answers to this essential question involve consideration of students' physical, emotional, social, interpersonal development, in addition to their intellectual development. This question is again encountered in a Disciplinary Literacies course as candidates read Patrick Finn's *Literacy with an Attitude: Educating Working-class Children in Their Own Self-interest* to they learn about the range of discourses and literacies their own students will bring to the classroom. Candidates then create a literacy concept map based on this and other readings in the course in which they define, connect, and relate sociocultural concepts and identity to each other. They transfer their insights into an essay on the sociocultural foundations of their own ideas about literacy, discourse, and "acceptable" language use in classrooms.

Later in an English Language Learning Methods course, candidates develop further depth of understanding of this question as they identify cultural and linguistic assets students bring to school and begin to realize the deficit mindsets they may have adopted from their own sociocultural background. By the time candidates ask "Who are my students?" at the beginning of student teaching, they have developed a much more informed sense of who their students are, as well as a more nuanced approach to answering it.

"What am I teaching" is first explored in a course on Communication for Engagement, Instruction, and Classroom Management as they learn about the social/emotional skills their students will need to thrive and learn and how teachers integrate the development of those skills into their unit plans and classroom routines. They study the CASEL Framework for Systemic Social and Emotional Learning, an integrated framework that highlights five social/emotional competencies promoted through multiple contexts, and embed their learnings in a classroom management plan as one response to What am I teaching?

This question is further explored in a Curriculum and Assessment course when candidates need to consider what they want their students to learn beyond knowledge and skills, including the deeper understandings of the content they are teaching and the essential questions of the disciplines they are teaching. For example, as they learn to design curriculum and assessment for understanding (Wiggins & McTighe, 2011), they evaluate the learning goals of published and teacher-made unit plans, discovering that they focus primarily on knowledge and skill goals.

Then, as we scaffold their writing of understanding and transfer goals for their own units (via Depth of Knowledge analysis, critique of drafts, application of definitions and criteria from Wiggins and McTighe, and classroom debate), they have grapple with what is worth knowing beyond simple knowledge and skills to articulate the deeper, less obvious meanings of their content area. For example, a candidate in physical education moves from saying she is teaching "basketball" to stating the deeper understanding about creating space on offense and legally deceiving an opponent (Wiggins & McTighe, 2011). A candidate in English moves from saying she is teaching *The Hunger Games* to the deeper understanding that texts are authors' representations and interpretations of the world with the transfer goal being to persuade others to act on issues they care about. The power of identifying deeper understandings as learning goals becomes evident when candidates realize the shallowness of their own educational experiences and typically vow to focus their future teaching on understanding.

At that point in the course, candidates tend to notice that their course syllabus contains the "enduring understandings" and "essential questions" of Designing Curriculum. They see their teacher educators modeling Understanding by Design and providing them with firsthand experience of curriculum design driven by essential questions at the heart of disciplinary inquiry-

- in other words, the kind of learning for deeper understanding they need to provide for their future students (Darling-Hammond & Oakes, 2019).

The Designing Curriculum course also includes an analysis of typical elementary and secondary tests which helps candidates realize that almost all the tests they have taken assess only knowledge and skills. This discovery prepares them for learning about project-based learning and performance assessments that elicit students' understanding and make content knowledge generalizable and transferable.

All these pedagogical strategies problematize candidates' original ideas about what they are teaching and deepen their thinking about what they really want their students to learn, all stemming from the Essential Question, What am I teaching?

"How should I teach?" is first explored in a School and Society course when candidates read memoirs like *Educating Esme: A Diary of a Teacher's First Year* (Codell, 2009) or *Losing My Faculties: A Teacher's Story* (Halpin, 2004). They then write an analysis of the authors' philosophical stances as applied to observations they have made in clinical placements to answer answer this essential question, How should I teach?

When faced with this essential question again in a World Languages Teaching Methods course, candidates consider what they are teaching beyond the simple declaration "Spanish" or "Chinese". They begin to recognize that most of them have learned a lot of grammar but little ability to actually communicate with the new language. This makes their acceptance of contextualized language instruction pedagogies both logical and compelling; it becomes the driving force behind learning a wide range of teaching and assessment strategies quite different from what most of them have experienced. When these candidates then encounter challenges in student teaching in a traditional grammar-based classroom, they can be guided back to their answers to "How should I teach?" from their methods course.

These examples of the use of three of the seven essential questions in teacher education programs show how they can be used to prompt candidates to explore the complexities inherent in learners and learning, curriculum, and teaching in particular contexts. The higher-level thinking engendered by the essential questions thus can deepen candidate learning and model their use in curriculum and instruction.

### ***Evaluating Potential Answers to Essential Questions***

In the Professional Praxis Framework, the dispositions of inquiry, efficacy, and equity orient professional behavior and act as tools through which to assess possible answers to the essential questions as they begin their professional practice. They prompt candidates to ask, Are the answers research-based? Efficacious? Equitable? Does an answer to "What am I teaching?" support equity and social justice? What about answers to, "What data indicate student learning?" or "In response, how should I teach?" Do they foster equitable instruction, curriculum, and schooling? The dispositions thereby represent practical professional commitments with which to negotiate responses to the essential questions.

### **Dialogic Tensions**

We have presented how essential questions make visible the questions that both novice and expert teachers grapple with continually and how the dispositions of professional praxis orient professional responses to those questions. To deepen candidates' understanding and shape their professional thinking and inquiry, the Professional Praxis Framework introduces Dialogic Tensions as a companion to the Essential Questions (Figure 4). The overall goal of Essential Questions and Dialogic Tensions in this framework is to nurture a dialogic learning environment



that models for and prepares candidates to teach their students for deeper learning. While the dialogic tensions do not appear on the framework graphic (Figure 2), they are nevertheless a central component of the Professional Praxis Framework. There are certainly other dialogic tensions candidates can explore; our experience using the ones listed below has shown their value in raising a number of fundamental problems in learning to teach stemming from, in particular, the apprenticeship of observation and the enactment of teaching.

#### Figure 4

##### *Pairings of Essential Questions with Dialogic Tensions*

<b>Essential Questions</b>	<b>Dialogic Tensions</b>
What is the purpose of schooling?	Reproductive/Transformative
Who are my students?	Individual/Community
How do my students learn?	Cognitive/Cultural Frameworks
What am I teaching?	Explicit/Implicit Curriculum
What data indicate student learning?	Assessment of/Assessment for Learning
How can I differentiate instruction to meet the needs of all of my students?	Differentiation/Uniformity
In response, how should I teach?	Theory/Practice

Drawing from Bahktinian concepts of the dialogical, in which there is a “constant interaction between meanings” (Bahktin, 1981, p. 426), dialogic tensions are two concepts or “big ideas” that are in conversation, or dialogue with each other, often embodying or negotiating both concepts. Dialogic tensions provide a context for deeper, more complex consideration of potential answers to the essential questions by making visible some of the competing concepts related to each essential question. Candidates’ inquiry into essential questions is guided by the dialogic tensions which act as a tool for developing robust, complex answers to the essential questions, allowing candidates to question their assumptions about learning and teaching.

Not only can answers to essential questions include both components of the dialogic tensions, this can be true even though the components can appear to contradict or oppose each other, such as transformative and reproductive purposes of schooling or differentiating for student learning needs while maintaining uniform course goals and methods. Thus, the dialogic tensions become an important grounding framework for thinking through the essential questions while simultaneously problematizing any simplistic answers.

Dialogic tensions also serve as guideposts, illuminating the complexities of the answers to the essential questions and the work of teaching. The dual nature of the dialogic tensions precludes a single, simplistic answer; candidates must consider each of the dialogic tensions and their relationship to each other. For example, schools and classrooms can be both reproductive and transformative; students reflect their own unique nature and also the shared culture of their communities; and learning involves both cognitive and cultural frameworks.

When we explicitly guide candidate learning with essential questions and dialogic tensions, we also model effective teaching of inquiry, helping candidates understand that “student inquiry is not random or unguided, as some novices may imagine” and needs to be

scaffolded to achieve the goal of deeper learning. The following examples demonstrate the use of dialogic tensions in teacher education programs (Darling-Hammond and Oakes, 2019, p. 207).

“What is the purpose of schooling?” prompts candidates consider the essential question in the context of writing their own philosophy of teaching in a School and Society course. The dialogic tensions illuminate schools’ efforts to recreate values, models of citizenship, and bodies of knowledge (a reproductive purpose), while also intervening as an agent of assimilation, or to create graduates who are agents of change (a transformative purpose). These two major ideas are at times conflicting ideas about the purposes of education which prompts candidates to create deeper, more nuanced answers.

As candidates ask “What am I teaching?”, they can use the concepts of explicit and implicit curriculum to identify social skills as learning goals (skills) in the unit plan they develop in Designing Curriculum. For example, when asking students to discuss what makes an election trustworthy, they can explicitly identify and teach social skills they expect students to use in their group work, such as turn-taking in elementary classrooms meetings or linking new comments to previous ones in a high school social studies debate.

Candidates can also deepen their understanding of the content they are teaching when they learn about enduring understandings in the Understanding by Design model. Secondary social studies candidates often begin by answering “What am I teaching?” by stating they are teaching a topic, for example, the three branches of government (the explicit answer). They dig for the deeper understanding about this topic and realize that what they really want their students to learn is an understanding that the three branches of government were designed to work “so that no single group will have too much power, because there is a tendency for power to corrupt” (the implicit) (Wiggins & McTighe, 2011, p. 45). Uncovering that implicit (the unstated, deeper purpose for teaching the topic) tends to elicit an excited “yes!” from candidates and to provide a much clearer focus on instructional and assessment strategies that lead to deeper learning.

In the same course, as candidates begin to write lesson plans, they engage with the essential question “What data indicate student learning?”. The dialogic tensions then become relevant to how different assessments are used in lessons to aid student learning and guide teaching decisions (assessment for learning) while other assessments that are more authentic can provide a summative view of student learning and understanding (assessment of learning).

When considering “Who are my students?” through the lens of the dialogic tension individual/community for a case study of a P12 student in an Educational Psychology course, candidates need to negotiate understanding the unique qualities of a particular student (individual) while also considering the ways in which such qualities inflect the cultural and social patterns of broader communities to which they belong (community). In doing so, they begin to get some insights into how the characteristics of an individual student and the community memberships of students may both align and contradict.

When asking “How can I differentiate instruction to address the learning needs of all my students?”, dialogic tensions help candidates understand and negotiate the needs of individuals and the class as a whole (differentiation and uniformity). Using a unit plan they have already created in an earlier course in the course Differentiated Instructional Practice, candidates determine which learning activities are conducted with all students and which ones need to be differentiated for students with specific learning needs.

Similarly, the essential question, “In response, how should I teach?”, introduces the complex relationship between theory and practice in which practice becomes a space where theory is both enacted and generated, and theory attempts to articulate assumptions and beliefs

that undergird practice. Candidates' textbooks about teaching students with a certain behavioral issue might suggest relevant strategies (theory), however, when analyzing a case study of a student with that issue (practice), candidates are faced with decisions that reflect complex philosophical and practical differences.

In sum, the Professional Praxis Framework is operationalized in teacher preparation programs through essential questions and dialogic tensions which both model and scaffold curricular approaches to deep learning. The dialogic tensions provide a structure through which to inquire about, organize, and interpret candidate insights about questions at the heart of teaching.

## **Summary**

### **Introduction**

This paper explores how teacher educators can construct and use a conceptual framework to deepen candidate learning and professional competence in teacher preparation programs. The criteria identified in the literature on professional frameworks suggest components for the candidate-oriented conceptual framework related to both the structure of the professional framework and its possible pedagogical uses by teacher educators with their candidates.

The Knowledge, Skills and Dispositions for Teaching: The "What" of Teacher Education (Darling-Hammond et al., 2021) which was designed as a conceptual framework that synthesizes the research for teacher educators, essentially providing a needed basis for a more common understanding of our field and a tool for program coherence. The Professional Praxis Framework builds from this synthesis of research and customizes it for candidate use with support and scaffolding from teacher educators. This new framework thereby supports deeper learning, generativity, and transferability of professional knowledge.

### **The Structure of the Professional Praxis Framework**

The criteria identified in the review of the literature related to the structure of professional frameworks recognize the need to make visible to candidates the major concepts, domains, and their relationships to each other in the field of teaching. The Professional Praxis Model is thus based on how people learn and the major knowledge domains of teaching in sociocultural contexts; centered around the professional commitment to equity; and visually represents the knowledge base of teaching. The central overlap of the three domains of teaching describes the vision of professional praxis as one characterized by commitment to and enactment of inquiry, equity, and efficacy in all teaching decisions.

The Professional Praxis Framework structures its retrieval and use by candidates through the inclusion of Essential Questions and Dialogic Tensions. It gives candidates a tool to think with as they encounter challenges in their coursework and clinical work, reminding them to consider the research on teaching and learning and the essential questions teachers need to grapple with as they think through specific teaching contexts and students. By identifying the field's Essential Questions and Dialogic Tensions, the problematic nature and complexities of teaching become more evident to candidates, deepening their learning, and modeling the kind of learning they should provide for their future students.

### **Pedagogical Uses of a Professional Praxis Framework by Teacher Educators**

In line with the research indicating that competence in a given field depends on the retrieval and use of a field's knowledge (as depicted in a conceptual framework), the Professional Praxis Framework is designed to be a pedagogical tool to deepen candidate learning. The Essential Questions and Dialogic Tensions act as a pedagogical tool for teacher

educators to prompt teacher candidates to consider the problematic nature, complexities, and nuances of teaching. When candidates practice the retrieval and use of the knowledge base of teaching, they develop professional competence as well as the dispositions to continue professional inquiry throughout their careers as they pursue increased efficacy and equity. The work of teacher educators is thus to scaffold candidate engagement with that knowledge base and the conceptualization of the field of teaching and learning to develop competence and the professional dispositions of inquiry, efficacy, and equity.

The examples shared in this article of teacher educators' use of the Professional Praxis Framework in courses and fieldwork demonstrate how the framework not only organizes the knowledge of the field of teaching for candidates, it serves as a pedagogical tool to deepen learning throughout their preparation programs. Their engagement with the Essential Questions and Dialogic Tensions in multiple courses and fieldwork settings deepens candidates' understanding of the complexities and challenges of teaching over time as they increase their knowledge of learners and learning, curriculum, assessment, instruction, and the purposes of schooling in a democratic country, the global context, and the realities of the 21<sup>st</sup> century.

Research indicates that competence in a given field depends on a solid foundation of knowledge organized around a conceptual framework in ways that facilitate retrieval and use. For teacher candidates to develop professional competence requires that they engage with a conceptualization of the knowledge bases of teaching and learning in ways that deepen their learning and their abilities to combine and apply their knowledge to novel, complex problems in different real-school situations. The Professional Praxis Framework is a means through which preparation programs can create a commonly held conceptualization and teacher educators can deepen candidate learning through a dialogic learning environment that models for and prepares them to teach their students for deeper learning.

## References

- Allen, A., Hancock, S. D., Starker-Glass, T., & Lewis, C. W. (2017). Mapping culturally relevant pedagogy into teacher education programs: A critical framework. *Teachers College Record, 119*, 1-26.
- Bakhtin, M. M. (1981). *The Dialogic Imagination* (M. Holquist, Ed.). Austin, Texas: University of Texas Press.
- Barnes, H. (1989). Structuring knowledge for beginning teaching. In *Knowledge base for the beginning teacher* (pp. 13-22). Oxford: Pergamon.
- Bransford, J., & Darling-Hammond, L. (2005). How teachers learn and develop. In K. Hammerness, L. Darling-Hammond, & J. Bransford (Eds.), *Preparing Teachers for a Changing World: What Teachers Should Learn and Be Able to Do* (pp. 358-389). Wiley.
- Bransford, J., Derry, S., Berliner, D., & Hammerness, K. (2005). Theories of learning and their roles in teaching. In *Preparing teachers for a changing world: What teachers should learn and be able to do* (pp. 40-87). San-Francisco: Jossey-Bass.
- Codell, E. R. (2009). *Educating Esme: A diary of a teacher's first year*. Chapel Hill, North Carolina: Algonquin Books of Chapel Hill.
- Darling-Hammond, L. (2006). *Powerful Teacher Education: Lessons from Exemplary Programs*. San Francisco: Wiley.
- Darling-Hammond, L., Flook, L., Schachner, A., & Wojcikiewicz, S. (2021). *Educator Learning*

- to Enact the Science of Learning and Development*. Learning Policy Institute.  
<https://doi.org/10.54300/859.776>
- Darling-Hammond, L., & Oakes, J. (2019). *Preparing Teachers for Deeper Learning*. Cambridge, Massachusetts: Harvard Education Press.
- Delpit, L. (2001). Acquisition of literate discourse: Bowing before the master? *Theory Into Practice*, 31(4), 296-302.
- Feiman-Nemser, S. (2008). Teacher learning: How do teachers learn to teach? In K. E. Demers, S. Feiman-Nemser, D. J. McIntyre, & M. Cochran-Smith (Eds.), *Handbook of Research on Teacher Education: Enduring Questions in Changing Contexts* (pp. 697-705). Abingdon, Oxford: Routledge.
- Finn, P. J. (2009). *Literacy with an attitude: Educating working-class children in their own self-interest*. Albany, New York: SUNY Press.
- Gee, J. P. (1992). What is literacy? In P. Shannon (Ed.), *Becoming political: Readings and writings in the politics of literacy education* (pp. 21-27). Portsmouth, New Hampshire: Heinemann.
- Halpin, B. (2004). *Losing my faculties: A teacher's story*. New York: Random House.
- Loughran, J. (2008). Toward a better understanding of teaching and learning about teaching. In M. Cochran-Smith, S. Feiman-Nemser, K. E. Demers, & D. J. McIntyre (Eds.), *Handbook of Research on Teacher Education: Enduring Questions in Changing Contexts* (pp. 1177-1182). Abingdon, Oxford: Routledge.
- McDiarmid, G. W., & Clevenger-Bright, M. (2008). Rethinking Teacher Capacity. In *Handbook of Research on Teacher Education: Enduring Questions in Changing Contexts* (pp. 134-156). Abingdon, Oxford: Routledge.
- McTighe, J., & Wiggins, G. P. (2013). *Essential Questions: Opening Doors to Student Understanding*. Alexandria, Virginia: ASCD.
- National Research Council. (2000). *How people learn: Brain, mind, experience, and school* (Expanded ed.). Washington, D.C.: National Academies Press.
- Shanahan, T., & Shanahan, C. (2008). Teaching disciplinary literacy to adolescents: Rethinking content-area literacy. *Harvard Educational Review*, 78(1), 40-59.
- Wiggins, G. P., & McTighe, J. (2011). *The Understanding by Design Guide to Creating High-quality Units* (G. P. Wiggins & J. McTighe, Eds.). ASCD.

## **Instructional Alignment Research and Answering Correctly: Did I Teach? Did They Learn?**

John Hobe, Georgia Southern University

### **Abstract**

Effect sizes (sigma) ranging from 1.2 to 3 sigma explain the instructional alignment effect. The evidence explains when critical features of instruction match the critical features of assessment, we can better answer the questions Did I teach? Did they learn? To appreciate the magnitude of these effects, a .65 effect size equals about one year's growth on commercially prepared norm referenced standardized tests. An effect size of 3 sigma is equal to about 4.5 years growth on commercially prepared norm-referenced standardized tests. Knowing the size of the difference between aligned instruction and assessment, and misaligned instruction and assessment, may help students' learning and teachers teaching.

### **Introduction**

When teaching we want to answer correctly: Did I teach? Did they learn? Answering these questions correctly lets students know what they learned, how they learned it and saves teacher time. Answering them incorrectly lets students know they did not learn, when in fact they did learn. Answering them incorrectly may lead a teacher to abandon or change teaching procedures that did work in the first place, wasting time. Time that could be used teaching others.

This article's purpose is to review research with significant effect sizes that explain Instructional Alignment (AL), and provide examples explaining how this evidence can be followed for teachers, school administrators, parents, and others concerned with increasing student learning. This information can help teachers and administrators answer the questions correctly: Did I teach? Did they learn?

### **Evidence Explaining Instructional Alignment**

Cohen described Instructional Alignment effects (Cohen, 1987). "When critical features of instructional stimuli match those of assessment, effect sizes routinely reach 1.2 to 3 sigma." (p. 1). To appreciate the magnitude of these effects, .65 sigma is equal to about one year's growth on commercially prepared norm-referenced standardized tests. It appears reasonable with effect sizes (sigma) this large, attention can be brought to these investigations. Schmidt (2001) in Squires (2012) provides further evidence supporting Cohen's (1987) effects including Tallarico (1984) and Wishnick (1989). Additional supporting evidence is found in MooSong, Bradley, & Yun (2015), including Martone & Sireci (2009) and Roach, Niebling, & Kurtz (2008), supporting Cohen's (1987) findings.

Breitsprecher (1991) investigated teaching 22 undergraduate students, randomly selected from 760 students studying introductory geography and geology. Verbal Mediation (VM), feedback monitoring (FM) and instructional alignment (AL) were investigated. Students studied material in peer groups with verbal mediation and feedback monitoring. An effect size of .89 sigma was received for FM, and when added to instructional alignment, the effect raised to 1.4 sigma. VM effects were less with incorrect information presented by a peer tutor and misalignment that happened during activities among the peer group.

Elia (1986) investigated teaching 45 lower social economic status fourth grade students from the inner city. All were taught synonyms for vocabulary words in phrases. One day after the instruction treatment was completed, one-third were tested using phrases. Another one-third was tested, using sentences. Another one-third was tested using paragraphs. Children also were tested on variations of the vocabulary words. The test format differences yielded a 91% score difference, and an effect size of 1.76. Variations of the vocabulary words showed an 85% difference. These details represented effect sizes ranging from .16 to 3.58 sigma. These questions were answered correctly with aligned instruction and assessment. Did I teach? Did they learn? The critical features between instruction and assessment Cohen (1987) explained above were changed using phrases, sentences, paragraphs, and vocabulary word variations.

Cohen and Stover (1981) taught students to solve math word problems with three experiments using aligned procedures with effects from 1.5-3.5 sigma. Koczor (1984) showed a 1.9 sigma difference between high-and low-aligned conditions with other skill and content areas. Fahey (1986) taught main ideas to community college students using aligned instruction and assessment successfully with effects to 1.2 sigma.

Hobe (1992) using aligned instruction and assessment, reported effect sizes of 1.50, .88, and 2.2 when teaching sentence and punctuation mark identification and sentence writing with second grade children using aligned instruction compared to the same lessons being taught with misaligned instruction.

Since 1966 (Reid, 2010) have developed fully aligned lessons for teaching reading and related skills. Reid (2010) provides the evidence under ECRI Short Description on the website. Evidence is included in the “Catalog of School Reform Models” by the [Northwest Regional Educational Laboratory](#) Reid (1996) ECRI is listed in Johns Hopkins University’s Best Evidence Encyclopedia (BEE) website as a program rated as having evidence of effectiveness for upper elementary reading (Slavin et al., 2009).

Regular education ECRI students demonstrate significantly greater gains ( $p < .01$ ) on the reading subscales of standardized achievement tests than (1) comparison group students receiving their regular reading instruction and (2) expectancies derived from national normative data (p. 1).

Special needs ECRI students (Chapter I, bilingual, remedial) and special education students (learning disabled) demonstrate significantly ( $p < .01$ ) greater than expected gains (derived from national normative data) and the Total Reading composite scales of standardized achievement tests (p. 1).

Reid also found significant gains with reading scores as explained in the “Catalog of School Reform Models” above from 1986-1990 with 2,274 students in 11 public schools, grades 1-10 in regular, special, remedial, bilingual, and Chapter 1 classes, coast to coast. More evidence is cited from 1990-1996, grades 1-11, at six sites, in five states with 1, also found significant 1,986 students.

### **How Can Teachers and School Administrators Follow this Evidence?**

When instruction and assessment are aligned the critical features in the instruction match the critical features in the assessment. The assessment uses the same critical features as in the instruction with a different example, unless the lesson is a rote lesson. If we are teaching students

to write the letter “A,” the lesson is rote because we want the children to write the “A” the way we showed them to write the “A.” If we teach the students to apply what we teach, the assessment example is different, but the critical features remain the same as the critical features used when the lesson was taught. Following, are aligned and misaligned examples I created. The principles here apply for all lessons at all complexity levels. See Table 1.

**Table 1**  
*Aligned and Misaligned Examples*

Teach	Assessment
<b>Aligned</b>	
<b>Critical Features- No regrouping</b> 34 + 22 = _____	<b>Critical features-No regrouping</b> 45 + 23 = _____
<b>Misaligned</b>	
<b>Critical Features-No regrouping</b> 22 + 34 = _____	<b>Critical features-subtraction</b> 34 + _____ = 41
Teach-What is taught	Assessment -What is assessed
<b>Aligned</b>	
<b>Critical features-write a sentence</b> Write a sentence. The boy ran.	<b>Critical features-write a sentence</b> Write a different sentence.
<b>Misaligned</b>	
<b>Critical features – write a sentence</b> Write a sentence. The dog barked.	<b>Critical features-picking a sentence</b> Pick a correct sentence from choices.
<b>Aligned</b>	
<b>Critical features- write Arabic Numerals for Roman Numerals.</b>	
LXX = _____	XXV = _____
<b>Misaligned</b>	
<b>Critical features-write Arabic Numerals for Roman Numerals</b>	<b>Critical features-write Roman Numerals for Arabic Numerals</b>



XII = \_\_\_\_\_

15= \_\_\_\_\_

**Aligned****Critical features-write an opinion****Critical features-write an opinion**

Write an opinion.

Write an opinion.

**Teach-What is taught****Assessment-What is assessed****Misaligned****Critical features-write an opinion****Critical features-write and explain an opinion**

Write an opinion.

Read an opinion and explain orally why it is an opinion.

Critical features - Explain in writing America's economic system using explanations for their educational, immigration, and income tax policies.

**Aligned**

Critical features - Explain in writing Poland's economic system using explanations for their educational, Immigration, and income tax policies.

Critical features - Explain in writing America's economic system using explanations for their educational, immigration, and income tax policies.

**Misaligned**

Critical features – Explain in writing Poland's economic system using explanations for their military, hospital care, and care for the elderly.

The above economic system lesson is misaligned because explanations taught to explain the economic system, were not the explanations required to explain the economic system for the assessment.

**Aligned**

Critical features - Read an author's qualifications for writing a text including education, employment, and other texts

Critical features – Read an author's qualifications for writing a different text including education, employment, and other

written. Explain in writing if the author is qualified.

texts written. Explain in writing if the author is qualified.

Teach-What is taught	Assessment-What is assessed
<p>Critical features - Read an author's qualifications for writing a text including education, employment, and other texts written. Explain in writing if the author is qualified.</p>	<p><b>Misaligned</b>            Critical features – Read another author's qualifications for writing another text using reviews of the author's text by others, number of the text reviewed being sold, and how long ago the text was written. Explain in writing if the author is qualified.</p>
<p>The above author qualifications lesson is misaligned because the qualifications being taught for explaining if the author is qualified to write the text were not the qualifications included in the assessment.</p>	

### Conclusion

A question often asked is when the critical features of instruction match the critical features of assessment does this mean the assessment problem is the same problem used when teaching? If it is a rote lesson, for example teaching a child how to write the capital "A," then the answer is "yes." The teacher teaches the child how to write the capital "A" and the child writes the capital "A" as the teacher showed the child how to write the capital "A." The critical features in the instruction and assessment match. When the teacher wants the child to apply the critical features being taught, the assessment critical features are the same as the features in the teaching, but the assessment problem is another example, using the critical features taught in the lesson. One example is the teacher teaches the children to write a sentence, beginning with a capital letter, explaining information and ending with a period. The assessment is to write a sentence beginning with a capital letter, explaining information, and ending with a period. The critical features used during instruction and assessment, beginning with a capital letter, explaining information, and ending with a period, match. They do not write the sentence for the assessment that the teacher used when teaching the children how to write a sentence. The instruction and assessment critical features match, but the children use the critical features taught to create an example, in this case, writing an original sentence. This assessment allows the teacher to answer correctly the questions: Did I teach? Did they learn?

### References

- Atchison, D., Garet, M. S., Smith, T. M., & Song, M. (2022). The validity of measures of instructional alignment with state standards based on surveys of enacted curriculum, *AERA Open*, 8, 23328584221098761
- Baez-Hernandez, R. A. (2019). Impact of instructional alignment workshop on teachers'

- self-efficacy and perceived instruction performance. *Educator Reform Journal*, 4(1), 1-13.
- Breitsprecher, C. (1991). *Relative effects of verbal mediation, feedback, monitoring, and alignment on community college learners' achievement (Instructional alignment, peer tutoring)* (Publication No. 303964318) [Doctoral Dissertation, University of San Francisco]. ProQuest Dissertations and Theses Global.
- Burroughs, N., Gardner, J., Lee, Y., Guo, S., Touitou, I., Jansen, K., & Schmidt, W. (2019). Relationships between instructional alignment, instructional quality, teacher quality, and student mathematics achievement. *Teaching for Excellence and Equity*, 63-100. Springer, Cham.
- Cohen, A. & Stover, G. (1981). Effects of teaching sixth-grade students to modify format variables of math word problems. *Reading Research Quarterly*, 2, 175-199.
- Cohen, A. (1987). Instructional alignment: Searching for the magic bullet. *Educational Researcher*, 16(8), 16-20. <https://journals.sagepub.com/toc/edra/16/8>
- Elia, J. (1986). *An alignment experiment in vocabulary instruction: Varying instructional practice and test item formats to measure transfer with low SES fourth graders.* (Publication No. 303546828) [Doctoral Dissertation, University of San Francisco]. ProQuest Dissertations and Theses Global.
- Fahey, P. (1986). *Learning transfer in main ideas instruction: Effects of instructional alignment and aptitude on main idea test scores.* (Publication No. 303465924) [Doctoral Dissertation, University of San Francisco]. ProQuest Dissertations and Theses Global.
- Hobe, J. (December, 1992). A comparison of two instructional methods in sentence and punctuation mark identification and sentence writing with second graders. *Quality Outcomes-Driven Education*, 2 (2).
- Martone, A., & Sireci, S. G. (2009). Evaluating alignment between curriculum, assessment, and instruction. *Review of Educational Research*, 79, 1332-136. <https://doi.org/10.3102/0034654309341375>
- MacPhail, A., Tannehill, P., Leirhaug, E., & Lars, B. (2021). Promoting instructional alignment in physical education teacher education. *Physical Education and Sport Pedagogy*. DOI: [10.1080/17408989.2021.1958177](https://doi.org/10.1080/17408989.2021.1958177)
- MooSong, K., Bradley, J., and Yun (2015). Enhancing student motivation in college and university physical activity courses using instruction alignment practices: Implication for research and practice. *Psychology in the Schools*, 45, 158-176. <https://doi.org/10.1080/07303084.2015.1085343>
- Koczor, M. (1984). *Effects of varying degrees of instructional alignment in posttreatment tests on mastery-learning tasks of fourth-grade children.* (Publication No. 303334731) [Doctoral Dissertation, University of San Francisco]. ProQuest Dissertations and Theses Global.
- Reid, E. (2010). *ECRI Short Description*. <http://www.ecri.cc/about.html>
- Reid, E. (2010). <http://www.ecri.cc/vita.html>
- Reid, E. (1996). *Exemplary Center for Reading Instruction (ECRI) validation study*. Salk Lake City, UT: Exemplary Center for Reading Instruction. (ERIC No. ED 414560).
- Roach, A. T., Niebling, B. C. & Kurz, A. (2008). Evaluating the alignment among curriculum, instruction, and assessments: Implications and applications for research and practice.

- Psychology in the Schools*, 45, 158-176. <https://doi.org/10.1002/pits.20282>
- Scanton, D., MacPhail, A. Walsh, C., & Tannehill, D. (2022). Embedding assessment in learning experiences enacting the principles of instructional alignment in physical education teacher education. *Curriculum Studies in Health and Physical Education*, 1-18.
- Schmidt, W. H., McKinght, C. C., Houang, R. T., Wang, H. C., Wiley, D. E., Cogan, L. S., & Wolfe, R. G. (2001). *Why schools matter: A cross-national comparison of curriculum and learning*. San Francisco. Jossey-Bass.
- Slavin, R.E., Lake, C., Chambers, B., Cheung, A., & Davis, S. (2009). Effective reading programs for the elementary grades: A best-evidence synthesis. *Review of Educational Research*, 79 (4), 1391-1466.
- Squires, D. (2012). Curriculum alignment research suggests that alignment can improve student achievement. *The Clearing House*. 85 (4), 129-135. <https://doi.org/10.1080/00098655.2012.657723>
- Tallarico, I. (1984). *Effects of ecological factors on elementary school student performance on norm-referenced standardized tests. Non-reading behaviors*. (Publication No. 303376115) [Doctoral Dissertation, University of San Francisco]. ProQuest Dissertations and Theses Global.
- Theobald, R. J., Goldhaber, D. D., Holden, K. L. & Stein, M. L. (2022). Special education teacher preparation, literacy instructional alignment, and reading achievement for students with high-incidence disabilities. *Exceptional Children*. 00144029221081236.
- Wishnick, K. T. (1989). *Relative effects on achievement scores of SES, gender, teacher effect and instructional alignment. A study of alignment's power in mastery learning*. (Publication No. 303802750) [Doctoral Dissertation, University of San Francisco]. ProQuest Dissertations and Theses Global.

**Advocating for the Use of Mursion Virtual Reality (VR) Simulation in Preparing Teachers:  
Charlotte Danielson's Framework for Teacher Preparation, Instruction, and  
Professionalism of Preservice teachers during the Covid-19 Pandemic and Beyond**

Natalie Johnson-Leslie, Arkansas State University  
H. Steve Leslie, Arkansas State University

**Abstract**

To positively impact preservice teachers' preparation and practice during the COVID-19 pandemic, Mursion Virtual reality (VR) simulation was selected as a viable field-experience option. The purpose of this qualitative case study is to present the experiences of preservice teachers utilizing Mursion VR in the context of Charlotte Danielson's Framework for teaching in teacher preparation. Media Naturalness Theory (MNT) was used to ground this case study. Results indicate there was efficacy in using Mursion simulations as preservice teachers learned the importance of planning lessons, maintaining a positive classroom environment, teaching effectively, and being professional at all times. An appeal for advocating the use of Mursion VR simulation is advanced to supplement the field experience of preservice teachers.

**Introduction/Study Context**

Mursion Virtual Reality (VR) can help future educators prepare themselves for teaching in the real world. VR offers a safe space where no physical or emotional harm can be inflicted as preservice teachers take risks in teaching. As a result, preservice teachers do not feel at risk from students or seen as unprepared, and are not at risk of being seen as "weak or insecure" because they are not in front of "an actual classroom full of students" (Hughes, et al., 2015, p. 135). Research has shown that a small but growing group of educators have integrated VR into their classrooms, with promising results (Castaneda et al., 2017). Furthermore, since the COVID-19 pandemic, VR has been used more frequently due to ubiquity, accessibility, the availability of commercially purchased VR equipment and applications, and technology being more available to everyday users (Bolkan, 2018; Lamkin, 2017; Orland, 2017; Taylor, 2017). Now, VR technologies are better and cheaper, resulting in more educators adapting to meet the needs of students (Mursion, 2021).

Mursion VR can be utilized to address classroom management and classroom discipline for a truly immersive experience. VR training leads preservice teachers to be fully immersed in this learning experience. Today's Generation Z students (Gen Zers) are attuned to technology because these 10-25 years-olds were born with the technology. Hence, Gen Zers (preservice teachers) are immersed in technology and are described as the most technologically saturated generation (Dorsey, 2022). Gen Zers are seen as "globally focused through the emergence of global pop culture, global brands, and a borderless virtual reality" (Generation Z., 2022, p. 1). Furthermore, Gen Zers are described as the "first true generation of digital natives" (Pertrock, 2021, p. 1). That means they are the first generation who has had constant access to the Internet. They have not lived a day without information at their fingertips, reality TV, on-demand information, streaming entertainment, online shopping capabilities, Cable TV, access to VR, and instantaneous communication via social media platforms, as indicated in Figure 1

**Figure 1**

*Gen. Zers use of Social Media Platforms Web 3.0. Source eMarketer (Pertrock, 2021)*

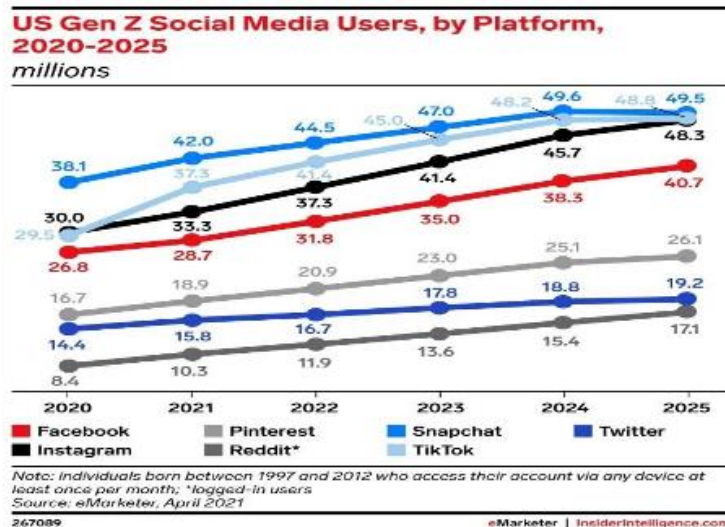


Figure 1 speaks to the high use of technology platforms by Gen Zers. This has implications for future teachers. The 21st Century preservice teachers experience the digital and physical worlds as interconnected, seamless, and fluid as they interface with business transactions, entertainment options, education, and communication in general (Dorsey, 2022; Pertrock, 2021). As educators strive to meet students where they are, training for preservice teachers to use various technologies, including VR, will connect with how Gen Zers think and learn (Lamb & Etopio, 2019). Educators in multiple fields have successfully used VR to deliver training and professional development for decades. For example, in the nursing field, using nanobots enables learners to take tours through the human body's various systems. In aviation and the military, VR has been used to train pilots and soldiers to succeed on the battlefield. Similarly, VR can be used in preparing preservice teachers by becoming immersed in multiple teaching scenarios to achieve a self-discovery experience in the classroom (Admiraal, 2017; Billingsley & Scheurman, 2014).

### Goal, Significance, Advocacy, and Research Questions

This study aims to use a dynamic VR simulation to provide High-Quality Instructional Materials (HQIM) for preservice teachers to keep abreast with high-quality classroom management and discipline strategies. Due to the COVID-19 pandemic, many preservice teachers did not participate in the level-one field experience. Therefore, this VR research is significant in creating a positive disruption in teacher preparation programs and providing needed field experience for preservice teachers. In addition, this research will help fill the gap in the literature, as only sparse research exists in the field of education addressing how VR can be used effectively in training preservice teachers. Furthermore, advocacy is made for using VR in teacher preparation, bringing an active, adaptive, student-centered experiential learning environment to preservice teachers (Dewitt, 2011; Thompson, 2011). The four research questions (RQu) outlined below are based on Charlotte Danielson's 2007 Framework for teaching.

### Research Questions

Research Question 1: How can you tell the teacher was prepared to teach the lesson? (Domain 1)

Research Question 2: How did the teacher ensure that the learning environment was conducive to

learning? (Domain 2)

Research Question 3: What were two classroom management challenges the teacher experienced during the lesson? (Domain 3)

Research Question 4: In what two ways did the teacher display professionalism during the lesson? (Domain 4)

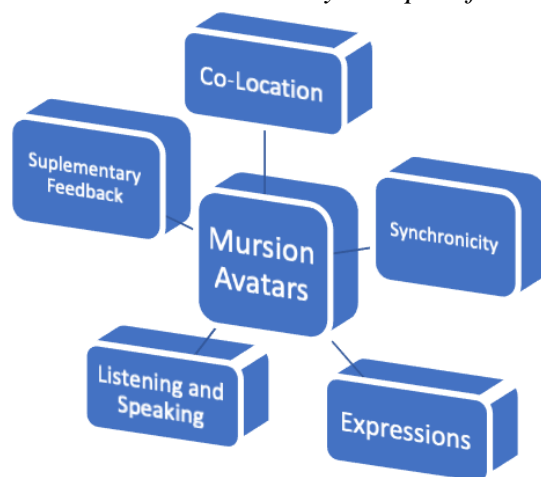
### Theoretical or Conceptual Framework

The Media Naturalness Theory (MNT) purported by Kock (2005) for the evaluation of the technology used for VR systems is appropriate for this case study. The theory builds on human growth and development as the ways people learn, interact, evolve, and change with technological advancements. MNT asserts that traditionally early humans communicated primarily face-to-face, and our brains have been wired for such communication. Jumping to our modern-day ways of communicating using primary and secondary technological means, including VR, require our brains to rethink and overcome cognitive obstacles.

MNT postulates that any digital communication medium that calls for the exchange of information in any form other than face-to-face will eventually pose cognitive obstacles to the preferred communication patterns (Kock, 2004). In other words, MNT places great emphasis on face-to-face communication. Furthermore, MNT argues that when external factors are controlled, the efficacy of digital communication leads to a decrease in the degree of naturalness of a communication medium (or its degree of similarity to the face-to-face medium) that will eventually result in predictable interactions such as (a) increased cognitive effort, (b) increased communication ambiguity, and (c) decreased physiological arousal (Roberts, 2011). In this case study, the external factors were not controlled for because this was not an experimental design study. However, what was observed when communicating with Mursion Avatars were the five key attributes of the MNT (Kock, 2005), as shown in Figure 2.

### Figure 2

*The five key attributes of Media Naturalness Theory. Adapted from Kock (2005)*



As shown in Figure 2, natural or traditional communication is comprised of 5 key elements. Kock (2005) posits that for digital communication to embody naturalness, five elements are crucial for success. First, *co-location*, the degree to which the user is removed from the physical reality they exist in and placed in the VR environment presented to them within the system digital medium, in this case, Mursion simulation teaching AVATARS. Second,

*synchronicity* refers to issues such as latency, lag, and the general speed of the VR immersive environment. Third, observation of expressions refers to the visual and optical aspects of VR. Visual enhancements such as stereoscopy, color gamut, and other display properties would also be observed. Fourth, The ability to convey and listen to speech focuses on the audio attribute. For teacher preparation programs to provide an immersive VR experience, there must be the capacity to convey and listen to clear audio with close attention paid to fidelity, volume, and directionality for the user. Fifth, Supplementary feedback refers to the extent to which additional inputs contribute to replicating traditional communication naturally and convincingly. Finally, additional inputs from the user and the AVATARS in the VR environment, such as body, face, and hand movements, provided feedback to the user, in this case, the preservice teachers.

### **Literature Review**

In the field of teacher education, teaching and learning are active, not passive. 21<sup>st</sup> Century technology continues to revolutionize how students learn, think, and by extension, how preservice teachers are trained (Darling-Hammond, 2000). The utilization of technology is significant in the field for educators to keep abreast with the changing landscape of K-12 education. With the rise in VR usage in education, it is warranted that more studies are carried out in this area (Thompson, 2011). Most articles and books reviewed throughout this process express the positive impact VR has on the world of education. Research shows that teaching simulations make educators more comfortable and confident in their subject area. The current simulations address real-life problems and consequences. These simulations include but are not limited to diversity, conflict management, parent-teacher conferences, and addressing individual student needs. VR provides a unique and safe environment for educators to become more comfortable and confident.

Teachers can use VR to provide preservice teachers with a safe space to address complex topics. For example, "teachers could use animation to teach strategies for dealing with high-risk safety situations, such as school intruders, attracting the student's attention to the animated character rather than a human intruder who might be particularly threatening to children" (Kellems, et al. p. 5). Being able to experience these events virtually allow students to be better prepared for when a similar event occurs in real life. VR can also be applied to less threatening situations. In a broad sense, VR could be used "[to] ensure that students were introduced to the concept of lateral violence and afforded the opportunity and time to practice conflict management skills" (Evans & Curtis, 2011, p. 653). This topic provides the students with skills and experiences that may be more relevant to their day-to-day lives.

The explosion of and improvements in technological advancements have resulted in many VR experiences recreating sensory experiences, including virtual taste, sight, smell, sound, and touch, as postulated in the works of (Corning, 2020; Kowitz, 2021; Yu et al., 2019). This is because the VR world aims at replicating the normal/natural experiences of humans in the virtual space. Sensory awareness is a powerful aspect of human experiences and existence. This concept has been experimented with since the 1950's when filmmaker Morten Heilig, known as the "Father of Virtual Reality," had the vision of a multi-sensory theater experience for patrons (Yu et al., 2019, p. 1). This vision has become a reality with features such as Sensorium in Regal 4DX theaters found in some museums, nature centers, theme parks, and entertainment places such as Disney. Learners learn best by doing or being engaged in a multimodal environment where all their senses are stimulated (Green, Chassereau, Kennedy, & Schriver, 2013) at a reasonable cost. The cost of MVRS systems has declined as the technology gets better and



cheaper with time. According to Byers (2022), based on his research, the number one tech trend is tech-enabled immersive learning due to lowered cost.

The price of a standalone VR headset is already lower than ever and expected to drop further to \$200 by 2023 (and even lower for mobile-based VR units). Cheaper units mean that more schools can use them as a standard part of their curriculum. Separately, the total value of Augmented Reality (AR) in education is expected to reach \$5.3 billion by 2023 (Byers, 2022, p. 1).

Therefore, preservice teachers have to be trained and ready to integrate immersive technologies in their classrooms to meet the need of students known as Generation Alphas (Gen Alpha). Gen Alphas are the current and future generations born between 2010 and 2025 (Dorsey, 2022). Realistically, some are not yet born, just like many future technologies. Gen Zers will be Gen Alphas' teachers for a long time. Therefore, Gen. Zers, who become teachers, have to develop the pedagogical content knowledge and skills regarding how to use all types of technologies to teach effectively

Based on the age and experience of many teacher preparers, VR has not been readily adopted (Dalinger, 2020; Kolitz, 2021), even though this technology can be influential with its impact on the teaching and learning landscape. These preparers must learn how to integrate these newer technologies in the teacher preparation programs to meet the learning needs of the Gen Zers in their classes. VR systems have changed with the power of technology, whereby there are multiple applications (APPS) available for students to experience VR. In Table 1, the 20 top VR APPs changing education are shown.

**Table 1**

*Top 20 VR Applications used in Education. Adapted from (The TECH ADVOCATE, 2022).*

Name	Description
1 <u>Anatomy 4D</u>	Study of the human body with clear images that come to life. Ideal for biology students or anyone with an interest in the inner workings of the body.
2 <u>Apollo 11 VR.</u>	This technology allows for a front seat in this documentary style app.
3 <u>Boulevard</u>	Students can tour six art museums, interact with famous artworks, and learn about the art, all thanks to the advancements of VR technology
4 <u>Cleanopolis</u>	Fighting climate change becomes interactive with this app. Students learn about CO <sub>2</sub> and battle along with Captain Clean to save the world.
5 <u>Cospaces</u>	Students are actively involved in the creation and creative process that goes into building a VR world

- 6 [Discovery VR.](#) Students explore futurist exotic natural locations anywhere on our planet
- 7 [Earth AR](#) See the globe from new unseen angles. Motion detection and zooming capabilities will make geography more interactive
- 8 [EON Experience](#) This collection of VR lessons encapsulates everything from physics to history. Students or teachers can create VR lessons from preloaded content
- 9 [Flashcards-Alphabet](#) Made for younger students, this immersive flashcard game teaches students words while bringing it all together with some colorful animal friends
- 10 [King Tut VR.](#) Explore the tomb of the legendary Egyptian king and get lost in the secret chambers full of hieroglyphics and treasures
- 11 [Google Translate](#) It's a new camera feature that students can use to translate 30 languages by aiming their camera at a student and watching in real-time as the text is translated. This additional feature is great for a language student
- 12 [Imag-n-o-tron](#) Stories jump off the page with Imag-n-o-tron. Downloadable content makes this app suitable for any age.
- 13 [InMind](#) Neurons and brain tissue have never looked more realistic. Travel into the brain and learn about anatomy with this great app
- 14 [Public Speaking VR.](#) Practice public speaking skills with this immersive VR experience. In a photorealistic environment, students prepare for job interview/presentation
- 15 [Quiver](#) Watch colored in creations come to life with Quiver. Through VR technology, 2D images become 3D and "walk" off the page.
- 16 [Sites in VR.](#) Explores famous landmarks in all their splendor. With an emphasis on Islamic temples, tombs, and ancient cities, students will get to see ancient sites
- 17 [Star Chart](#) Students can learn about constellations by aiming their phones at the night sky. These features allow students to interact with the planets and discover space
- 18 [TiltBrush](#) Creating 3D paintings with TiltBrush, is a reality. Painting is done using a handheld "paintbrush," to create anything students can possibly imagine

- |    |                        |   |
|----|------------------------|---|
| 19 | <u>Titans of Space</u> | This guided tour of space is both informative as it is breathtaking. With voice overs, facts, and scored music, it is a cutting-edge VR product |
| 20 | <u>Unimersiv</u>       | History comes alive with the apps developed by Unimersiv. Students can explore ancient Greece, the Titanic, or the Egyptian Mysteries           |
- 

As shown in Table 1, with the advances in technology, there are multiple VR applications (APPs) or Web 3.0 technologies for the 21<sup>st</sup> Century classrooms. The 20 VR applications tabulated above are usable at all levels for K-12 teachers and students. Preservice teachers need to be introduced to these various technologies; given a chance to play with each one; then, they can evaluate each one to make the decision regarding the VR technology that best fits the needs of their students based on the learning goals and objectives.

Billingsley et al. (2019) conducted a systematic review of the literature that addressed the use of VR simulations in teacher preparation programs. Their review found seven reports on this phenomenon. This analysis concluded that VR is a viable tool that can be used successfully in teacher preparation. However, they also concluded that more research needs to be conducted to measure the direct impact of VR training on teachers' performance and student learning. Finally, Sasaki et al. (2020) outlined how VR simulations were used successfully during the COVID-19 pandemic to prepare teacher candidates for their practicum experience, bringing in their personal and professional affordances.

### **Affordances**

To be adequately prepared for effective teaching in this digitized society, preservice teachers need to have quality content and pedagogical content knowledge and extensive field experiences. Therefore, teacher educators in colleges of education have to think outside of the proverbial box, to facilitate preservice teachers with these affordances. In the VR world, these affordances include presence, immersion, embodiment, agency, and empathy (Johnson-Glenberg, 2019; Schroter, Tiede, & Latoschik, 2021; Shin, 2018), as shown in Figure 3.

**Figure 3**  
*Five VR Affordances in Education*

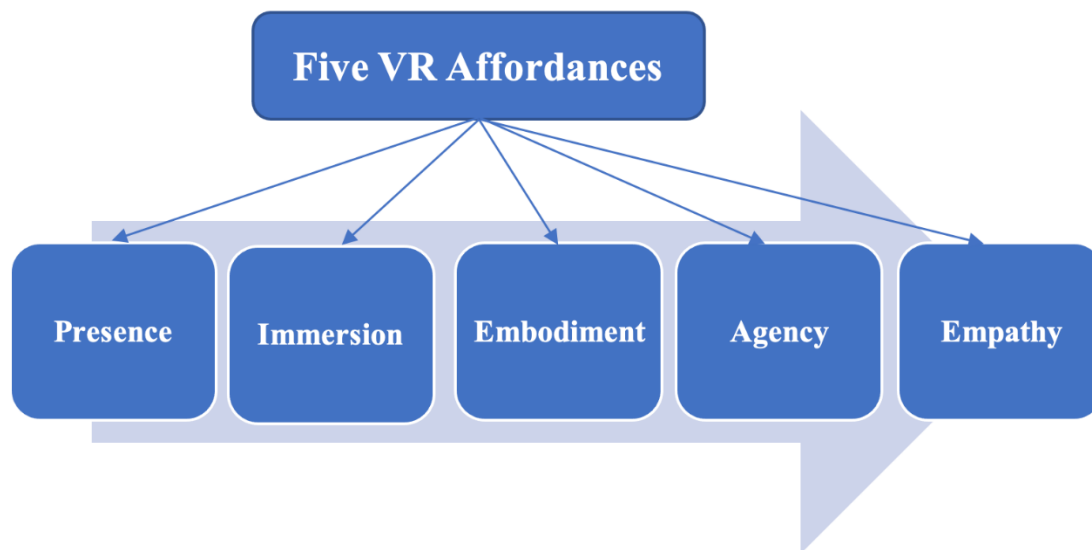


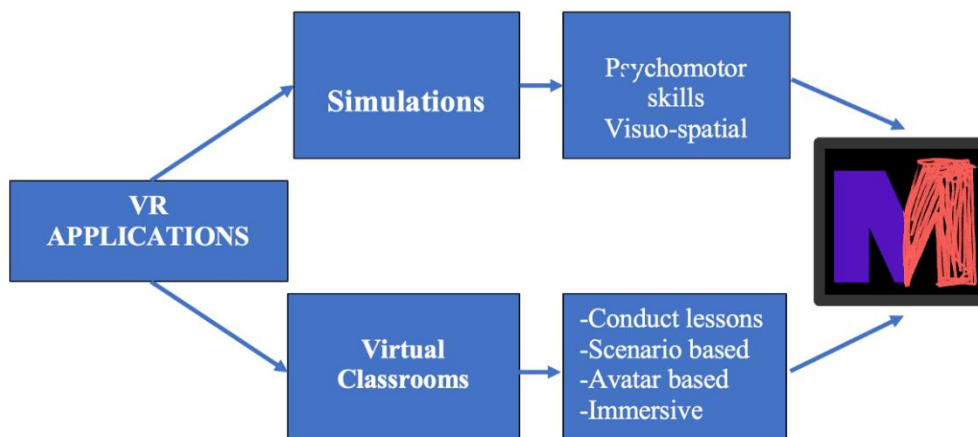
Figure 3 shows the five VR affordances found in the literature. Affordances can be defined as the capabilities of organisms to perceive possibilities for motor action according to the capacities of their bodies and environment (Penny, 2017; Sanders, 1999). Affordances are relational as they are always about individual characteristics embodying the organism. This affordance includes bodily dimensions, skills, knowledge, and goals. In this study, affordances in the VR world are understood based on the presence of the user, the depth of immersion, how the user embodies the VR, the agency or representation the user brings to the VR environment, and finally, the empathy showed as the user interacts with avatars in VR environment. Sanders (1999) indicated that in the future, while technological appropriation increases in society, affordances concerning the VR learning environment will be perceived similarly to affordances in the physical or face-to-face learning environment.

The research of Burlamaqui and Dong (2015) considered affordance as converging at the "user's perception of the environment, and the physical properties of the object" (p. 3). Hence, affordances are active and not passive or static for each user. This is in keeping with the fact that affordances are not all visible both in the physical and the VR worlds. In other words, some affordances are easily perceived, whereas some are present but not easily perceived (Norman, 2013). Contrasting Norman's work with that of Dreyfus and Dreyfus (1999), affordances are described as actionable based on the user's prior knowledge. Their findings also correlate with Kirsh (2009), who concluded that affordances are objective and actionable as the user interacts with the environment physically or virtually. In this study, the avatar-based Mursion VR simulation allowed preservice teachers to utilize their affordances as they supplemented their field experience.

### **Mursion™ VR Simulation**

There are two primary types of VR applications used in education and are described as simulations and virtual classrooms (Schroeter, Tiede, & Latoschik, 2021), as seen in Figure

**Figure 4**  
*VR Applications in Higher Education*

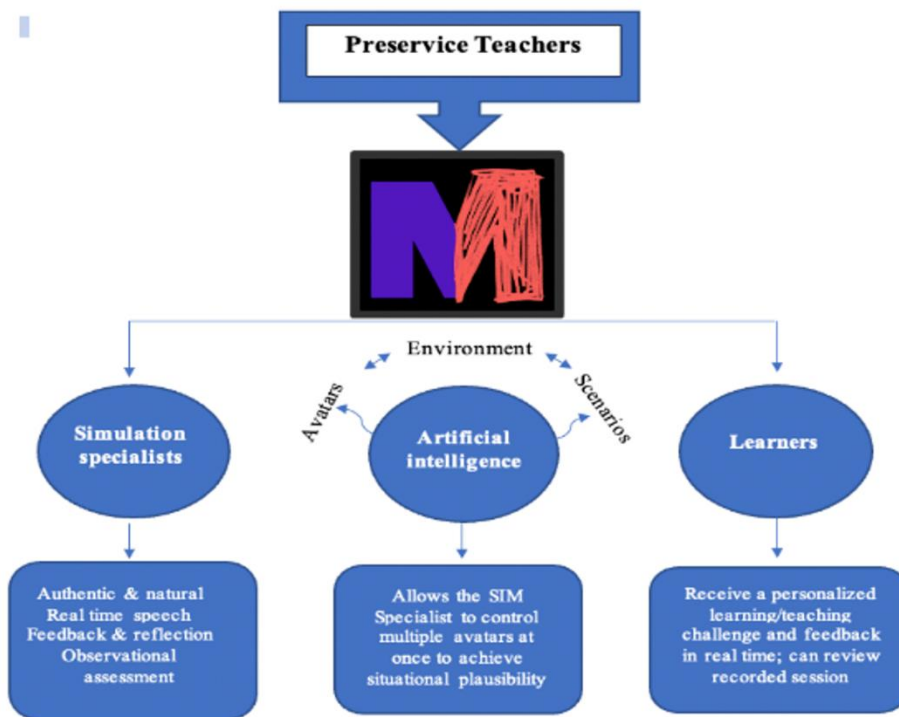


As shown in Figure 4, first, simulations are used mainly for psychomotor skills development and visuospatial understanding. These simulations are used extensively in aviation, the medical field, and the military for the user to develop needed visuospatial skills (O'Connor et al., 2020; Sugand et al., 2015; and Freina-Ott, 2015). For example, according to Cohen and Wong (2021), simulations have helped medical students foster and develop a wide range of technical and surgical skills (e.g., suturing, setting a fracture) as well as needed relational skills (e.g., bedside manners). Second, virtual classrooms serve as an avenue for conducting lessons from a distance, having the teacher and the actual students in multiple locations rather than in a physical classroom (Gao, 2021). Based on the multiple affordances in this area, immersive live role-play and mixed reality can be used in the virtual classroom. Mursion VR was selected because it had the blended features of both the simulations and live role-play interactivity.

According to Dalinger et al. (2020), Mursion VR is an iteration of TeachLive™ (TLE) technology. Mursion VR was identified to supplement the field experience hours the preservice teachers lost in the previous semester due to the COVID-19 pandemic. This VR simulation is one of many on the market, but Mursion has been used extensively in education. Mursion VR is a high-tech software that works in real-time (Mursion, 2020; Dalinger et al., 2020). Mursion VR blends artificial intelligence with live human interactions, as seen in Figure 5.

**Figure 5**

*Mursion-How it works. Adapted from Mursion.com (2022)*

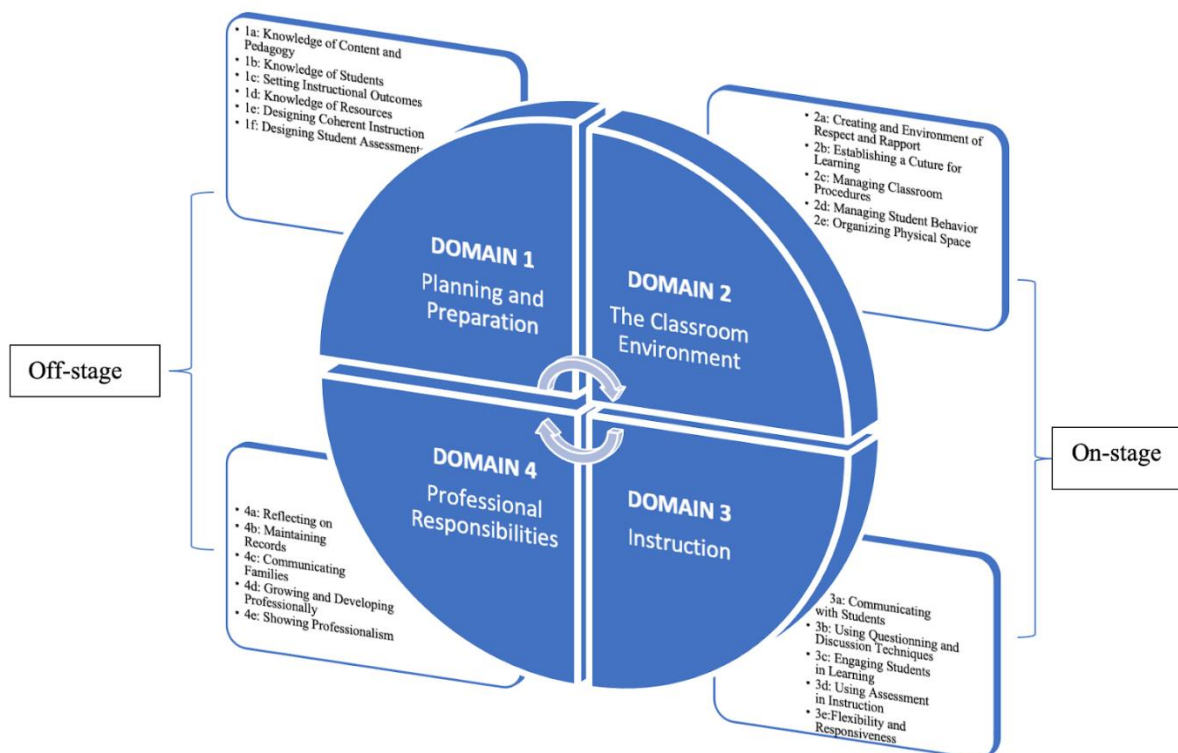


As shown in Figure 5, Mursion VR puts the learners in an immersive training situation with human-powered interactions through the simulation specialists (sim. specialist). The role of the sim. specialist includes: (1) interfacing with the technology, five student avatars, and teacher candidates; and (2) operating behind each avatar, hearing and seeing the preservice teachers interact with avatars in real-time, like 'natural students.' In other words, the Sim. specialist "controls the action of the student avatars in real-time, so all interactions are responsive and reflect real-world teaching and learning experiences" (Sasaki et al., 2020, p. 332). Therefore, the avatars are programmed to respond "naturally" to the preservice teacher's presence, embodiment, body language, prompts, and questions. In keeping with this study's purpose, preservice teachers' experiences are documented with a focus on the responsibilities outlined in Charlotte Danielson's 2007 Framework for Teaching.

### **Charlotte Danielson's Framework for Teaching**

The activities outlined by the preservice teacher in the classroom reflect some of the many teacher responsibilities outlined in Danielson's (2007) Framework of teaching, shown in Figure 6.

**Figure 6**  
Charlotte Danielson's 2007 Framework for Effective Teaching



As shown in Figure 6, Danielson's (2007) Framework for Effective Teaching is divided into four main domains, comprising 22 components and 56 elements. Each domain organizes the many and varied responsibilities that a teacher is expected to carry out each day. Furthermore, the domains are very dynamic, and there is overlap between and among the domains. Domain 1 features Planning and Preparation that takes place before instruction. Domain 2, The Classroom Environment, is considered when planning and instruction (showing the overlap of domains 1 and 2 and 2 and 3). Domain 3 is the heart of teaching as it focuses on what the teacher does and expects the student to do during instruction. Domain 4 addresses Professional Responsibilities, which occur all the time before, during, and after teaching. Further analysis of the four domains shows that, generally, Domains 1 and 4 are "off-stage," whereas Domains 2 and 3 are "on-stage." In essence, teachers spend a lot of time off-stage preparing their lessons for the classroom and on-stage actively teaching.

"The Framework for Teaching (FFT) is one of the most widely used observational systems for evaluating teacher effectiveness and driving professional development conversations in schools" (Kettler, & Reddy, 2019, p. 1). The framework for effective teaching has been adopted and used in many school districts, 49 states, US territories, and among educators worldwide in 15 countries (The Danielson's Group, 2022). Research indicates the power of the framework to support teacher effectiveness as they reflect, collaborate, help student launch inquiries, and support innovativeness—all having a positive impact on student learning (Danielson's Group, 2022; Dewitt, 2011; Reddy, Dudek, & Fabiano, 2015). In fact, the widespread use of the framework has been found to help with the growth of teacher effectiveness

which leads to improved student learning outcomes and helps teachers maintain a professional learning environment, power to accelerate teacher growth, improve student outcomes, and create a more rewarding and sustaining professional environment. Furthermore, the framework is designed to guide educators from novice to expert in (1) expanding teacher practice, (2) learning current ways of engaging students, especially in this technological age, and (3) creating new and effective strategies that will impact the ways educators do conceptualize the school landscape.

In keeping with the work of Darling-Hammond (2000), data from a 50-state survey revealed that teacher quality is a key factor when coupled with human capital, access to services, and physical resources together positively impact student achievement. Findings based on the qualitative and quantitative analyses also imply policy changes and investments impact teacher quality. Strong teacher quality is said to have the most significant impact on student performance from all strata of society. "...measures of teacher preparation and certification are by far the strongest correlates of student achievement in reading and mathematics, both before and after controlling for student poverty and language status" (Darling-Hammond, 2000, p. 1). Therefore, in keeping with Charlotte Danielson's 2007 Framework of Teaching, the activities outlined in the framework are designed for improved teacher quality. Furthermore, the analysis by Darling-Hammond (2000) indicates that "policies adopted by states regarding teacher education, licensing, hiring, and professional development may make an important difference in the qualifications and capacities that teachers bring to their work" (p. 1). The capacities brought by teachers to the classroom are strengthened by the work of Danielson as teachers manage themselves and their classrooms. In the next section, the methodology will be delineated.

### **Methodology**

During Spring 2022, preservice teachers in a secondary education program were introduced to Mursion VR simulation of teaching AVATARS to supplement their field experience. Of the 28 preservice teachers, only three preservice teachers completed their field-one experience because of the COVID-19 pandemic. It is required that students complete 20 hours of field experience during level one or first placement. Preservice teachers in this Performance Based pedagogical level two course require 44 hours of field experience.

This case study research was conducted in a naturalized context consistent with the work of (Lincoln & Guba, 1985), whereby this study's approach was not unduly influenced or controlled by researchers. The preservice teachers utilized and experienced VR in the classroom, addressing multiple everyday scenarios. The data collection and analysis procedures led to rich, textual, and descriptive data (Denzin & Lincoln, 2008). The researchers seek to understand the phenomenon of using VR to provide field experience within an authentic setting.

### **Course Description, Participants, Structure, and Context**

The research was carried out at a mid-south university that prepares secondary education preservice teachers. The secondary education discipline-specific program is housed in individual colleges across campus. The education courses are found in the College of Education and Behavioral Sciences. At this mid-south university, preservice teachers must take 12 hours of education classes and 12 hours of internship for licensure in grades K 12 or 7-12.

#### ***Participants***

All teacher education students, except agricultural education, specializing in secondary education, need to take the class, Performance-Based Instructional Design (SCED 3515) for



licensure. There were 28 preservice teachers enrolled in this level two class, attending classes for sixteen weeks where they learned to generate and refine their lesson plans. Preservice teachers followed the edTPA guidelines, adopted by the teacher education department, for writing lesson plans. These lessons must show clear connections between standards, objectives, materials, procedures, how student performance would be evaluated, and technology integration in meaningful ways. After the first six weeks of in-class teaching, preservice teachers spent the last ten weeks in public schools for 44 hours of field experience.

### ***Structure & Context***

During the Spring 2022 semester, preservice teachers were introduced to an immersive learning experience with Mursion VR simulation to help bolster their teaching experience. All preservice teachers were drawn from two sections of the required course. During this semester, the situation surrounding COVID-19 was fluid and changed rapidly, which often impacted preservice teachers' placement in schools. For example, if a preservice teacher contracted COVID-19, the preservice teacher had to be isolated for up to eight days, depending on the Centers for Disease Control (CDC) recommendations. Furthermore, if a preservice teacher was in contact with a positive case of COVID-19, that led to further disruption. Mursion VR helped to lessen the impact of these disruptions brought on by the COVID-19 pandemic.

### **Study Design**

The case study design signified the context-dependent inquiry and what is called by Guba and Lincoln (1988) inductive data analysis. The timeline activities/data collected during this semester are shown in Table 2.

**Table 2**

### *Timeline of Activities*

Timeline	Activities/Data Collected	Weeks
Spring 2022	Introduction to Mursion	Weeks 1-2
	Pre-test	Week 2
	Simulation immersion	Weeks 3-6
	3 Reflections	Week 3-6
	Post-test	Week 6

Table 2 outlines the activities conducted over the spring 2022 semester. Preservice teachers were immersed in Mursion VR simulation for the first six weeks of the semester.

### **Instrumentation**

Qualitative data was collected from reflection # 1 preservice teachers completed using Google Docs. Participants completed reflection # 1 after completing the first teaching episode. There were 24 reflective questions (11 open response items and 13 closed response items). The purpose of the open-response items was to obtain authentic responses from the preservice teachers regarding their experience with the VR simulations.

Questions were adapted from the reflection questionnaire developed by Mursion and Charlotte Danielson's (2007) framework for teaching.

### **Data Analysis**

The data obtained from reflection # 1 were analyzed using thematic content analysis techniques. This analysis is in keeping with Media Natural Theory (MNT), the theory used to

ground this research, as a means for preservice teachers to interpret meaning from the natural content. Preservice teachers were immersed in the naturalistic VR simulation, then asked to reflect on their experience immediately following each teaching episode. In this research, the data analyzed was obtained from reflection # 1. This reflection was selected because all preservice teachers completed the same teaching scenario, "expectations for the classroom." Hence, reflection # 1 provides a measure of consistency against the background of Charlotte Danielson's framework for teaching. For the qualitative analysis, textual reflections were first coded and assigned a node independently by researcher # 1 and researcher # 2 based on rules agreed upon for the naturalistic coding scheme. The researchers, having agreed on the main themes, manually pawned and recoded the textual data to determine the themes and nodes for deeper coding and analysis by both researchers. The codes and nodes were generated based on the underlying reasoning types through Glaser and Strauss' (1965) views on open coding and constant comparisons. For example, data collected to answer research question # 1 was coded as the "planning and preparation to teach with VR." This category was further coded as "preparation of the teacher," with other themes emerging, as shown in Table 3.

**Table 3**

*Qualitative Data Samples of Domain 1 with VR—RQu 1*

Category	Codes	Data Sample
Domain 1	Lesson Planning preparation Outline Clear goal	"I was prepared to teach my classroom when the lesson started. I had a clear goal for the classroom set in mind. I knew the topic I wanted to teach, and I made a small lesson plan before my class to ensure I had my points down" ( <b>Preservice teacher # 7</b> ).

*Note:* This data sample came from reflection # 1, completed after the first teaching scenario.

Table 3 shows a selected data sampling based on the categories, codes, and themes. This participant was ready and prepared to teach. This is the essence of Domain 1—Planning and preparation. This preparation takes place before instruction. The data sample references the voices of the preservice teachers based on their expressed experience with Mursion VR simulation. The results, findings, and following discussions are presented based on the four research questions.

### **Results, Findings, and Discussion**

This research aimed to explore preservice teachers' experiences using Mursion VR to supplement field experience due to the COVID-19 pandemic. In this study, 28 preservice teachers from six majors explored using Mursion VR simulations to supplement their field experience. Demographically, the data revealed 13 preservice teachers identified as females, 12 males, and three preferred not to disclose gender. Table 4 shows the majors from which preservice teachers who participated in this research were drawn.

**Table 4**  
*The Majors of Preservice Teachers Participants (N = 28)*

Majors	Number	Percent
English	8	28.6%
History	4	14.3%
Instructional Music	8	28.6%
Mathematics	2	7.1%
Physical Education	3	10.7%
Science	1	3.6%
Vocal Music	2	7.1%
	28	100%

As shown in Table 4, the 28 preservice teachers were drawn from six majors that participated in this study. The majority of preservice teachers were from English and instrumental music (28.6%) each, history (14.3%), physical education (10.7%), mathematics and Vocal Music (7.1%) each, and science had the lowest percentage of participants (3.6%). The low number of preservice teachers in the science and mathematics majors is in keeping with the literature on teacher shortage, especially in the Science, Technology, Engineering, and Mathematics (STEM) related areas in this research (Lily, 2016). In the following section, each question is analyzed based on Charlotte Danielson's (2007) Framework for Teaching.

Research question 1: How can you tell that the teacher was prepared to teach the lesson?  
 (Domain 1)

Danielson's (2007) framework for teaching is broken down into four quadrants or domains of teacher responsibilities (see Figure 6). The first domain addresses "Planning and Preparation." In this domain, there are six components, as shown in Figure 7.

**Figure 7**  
*Domain 1: Planning and Preparation*

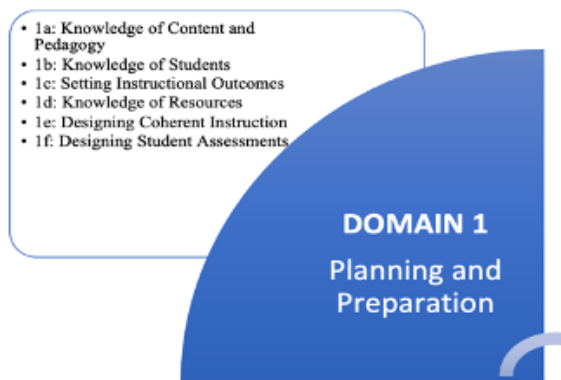


Figure 7 shows the six components, (a) Knowledge of Content and Pedagogy; (b) Knowledge of Students; (c) Setting Instructional Outcomes; (d) Knowledge of Resources; (e)

Designing Coherent Instruction, and (f) Designing Student Assessments. Each component emphasizes how the teacher needs to be knowledgeable and organized to affect students learning in the classroom. This research shows that preservice teachers were prepared to teach the Mursion avatars. For example, preservice teachers indicated the following regarding question one—preparation to teach.

You could tell I was prepared because the lesson flowed from one idea to the next. I had prepared a lesson outline for me to follow. I had even looked at the session to get a better idea of what I was supposed to be talking about. There was never any pause in the lesson. We would talk about a point and then move on to the next one (**Preservice teacher # 6**).

As indicated above, this preservice teacher was prepared and ready to teach. As a result, the flow and momentum of the class were smooth because the preservice teacher could go from one point to the next. This level of preparation also indicated coherence in instruction. Another preservice teacher indicated, "I demonstrated preparedness and had a lesson plan and other information available at my disposal alongside answers to the questions the avatars had. In addition, I had background knowledge on the subject to answer further questions" (**Pre-service teacher # 25**). Hence, this preservice teacher showed knowledge of content and pedagogy (1a) and demonstrated knowledge of resources (1d).

According to Danelson's Group (2022), educators, including preservice teachers who excel in domain one, are always prepared to organize teaching materials and content coherently. Additionally, these teachers clearly understand students (race, culture, ethnicity, background, and interests) and how students learn by setting clear and balanced instructional outcomes that are high yet achievable. They have reliable methods of assessing student learning, challenging students appropriately, and helping students connect with the content in meaningful ways. These preservice teachers were acutely aware that having a solid plan of action before teaching helped to ensure a positive learning environment.

Research question 2: How did the teacher ensure that the learning environment was conducive to learning? (Domain 2)

The focus of Domain two is on the classroom environment. Five components together describe the conditions and qualities of the teaching and learning landscape that must be designed to support student success, as shown in Figure 8.

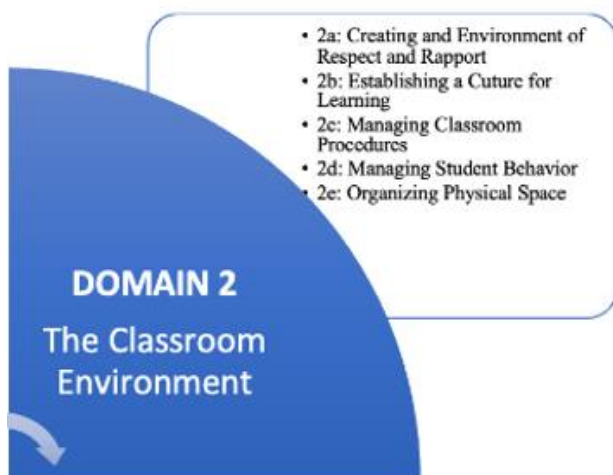
**Figure 8***Domain 2: The Classroom Environment*

Figure 8 shows (2a) creating an environment of respect and rapport; (2b) establishing a culture of learning; (2c) managing classroom procedures; (2d) Managing student behavior; and (2e) Organizing the physical space. According to Danielson (2007), "Fostering an inviting culture for learning that focuses on student well-being, encourages academic risk-taking, and promotes habits and mindsets that support student success is the ultimate goal of these components" (p. 1). Preservice teachers demonstrated an awareness of the components of domain 2, as evident in their comments. For example, one preservice teacher indicated, "I made sure to listen and be respectful of the students so that they would do the same to me" (Pre-service teacher # 1). This preservice teacher was very aware of component 2a. Another preservice teacher participant indicated

I established expectations and boundaries. I created an environment where students felt free to discuss. I did this by forcing each person to contribute to every question. For the first few questions, I would have each student answer. After a while, I would just open the floor for anybody who wanted to participate. Almost everybody was willing to contribute after that. AVATAR (A) and the quiet boy who sits in the middle were the only ones I would have to personally call on to contribute. I established boundaries where discussions were concerned. When having a discussion, they don't have to raise their hand if it relates to the discussion. If it doesn't relate to the current discussion or I'm teaching, then they have to raise their hand. Once their hand is raised, I will call on them once I get to a point I can take a breath. I made sure to pay extra attention to the students who were not as willing to participate (Pre-service teacher # 8).

Based on this response, component 2d was of great importance to this preservice teacher. An emphasis was placed on expectations and setting boundaries in the classroom. The VR research has shown the importance of fostering learning environments that are challenging, engaging, and supportive of students' interests. One preservice teacher indicated, "I had the students weave together their interests into the subject matter that we were discussing. I also calmly woke up

students when they would fall asleep" (Pre-service teacher # 14). It is crucial to ensure that all students feel safe in the classroom both emotionally and physically and each has a voice.

I tried to incorporate all of my students in the conversation and had them write down part of their activities. I tried asking thought-provoking questions as well and tying the content into a bigger picture (Preservice teacher # 18).

Indeed, the recognition of each student is vital in fostering a positive learning environment "I had the avatars share their thoughts when we listened to music...I also tried to be as positive and not negative" (Pre-service teacher # 16). Preservice teachers were fully aware of establishing a learning environment that was fair, equitable, and riddled with empathy for students. Therefore, when teaching avatars, the preservice teachers kept them engaged, provided clear instructions, and fostered an environment free from biases and conducive to learning. However, these classes had classroom management challenges that preservice teachers worked to overcome.

Research question 3: What are two classroom management challenges the teacher experienced during the lesson? (Domain 3)

In this section of the research, preservice teachers were asked to identify two classroom management challenges encountered while teaching the Mursion Avatars. The heart of the teaching experience is outlined in Domain 3 and shown in Figure 9.

**Figure 9**

*Domain 3: Instruction*

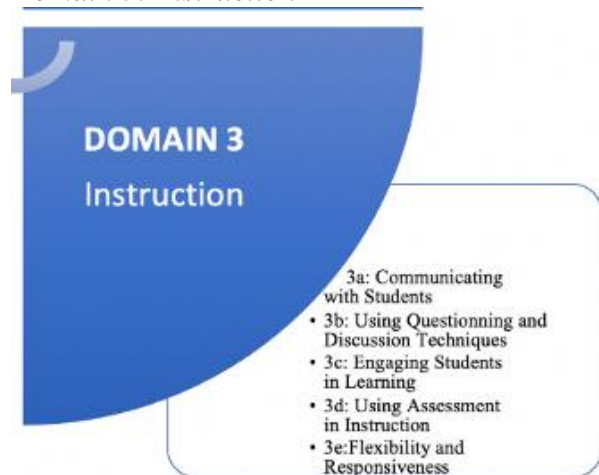
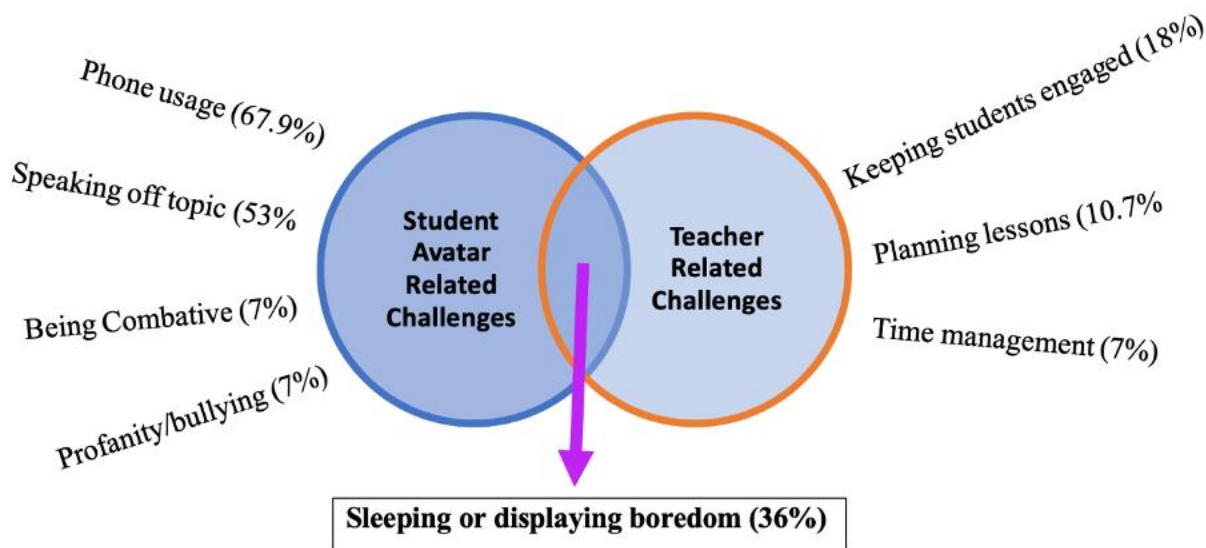


Figure 9 shows (3a) Communicating with students; (3b) Using questioning and discussion techniques; (3c) Engaging students in learning; (3d) Using assessment in instruction; and (3e) Demonstrating flexibility and responsiveness. Preservice teachers were expected to communicate effectively with students, use effective questioning and discussion techniques; keep students actively engaged in the lesson; assess students learning both formatively and summatively, and be flexible and responsive, especially to students learning needs. These responsibilities are many and varied, and they are not free from students' challenging behaviors. Therefore, teachers must use effective strategies to balance challenging student behavior with learning (Pazilah et al.,

2019). Figure 10 presents the challenges that preservice teachers identified they encountered when teaching Mursion avatars.

**Figure 10**

*Three Categories of Challenges Identified by Preservice Teachers*



As shown in Figure 10, the challenges identified are in three main categories (1) Student-related (avatar), (2) Teacher-related (preservice teacher), and (3) the intersection of student and teacher-related challenges.

### **Student-related challenges**

The student-related challenges include actions by the students. Four primary challenges were phone-related, speaking off-topic, being combative, using profanity, and bullying. Based on the content analysis, 21 preservice teachers, or 75%, reported phone-related disturbances. For example, one preservice teacher indicated

I struggled with a couple of students repeatedly pulling their phones out. I asked each student to put their phones away, but some students had trouble following my orders. I also struggled to keep each student active and participating in my lesson. A few students seemed very eager and excited to participate, while others seemed bored and did not give great answers even when called on (Pre-service teacher # 8).

Classroom management and discipline issues are generally areas that preservice teachers struggle with because they do not have adequate teaching experience. This preservice teacher indicated struggling with students on their phones and others not being engaged in the lesson. Still, another preservice teacher indicated, "my challenge was keeping students off their phones and making sure they were all staying on task and not being distracted" (Pre-service teacher # 23). "The phone kept going off, and I wasn't clear on questions" (Pre-service teacher # 24). In today's highly technological society, 21<sup>st</sup> Century teachers are faced with the challenge of successfully integrating technology in their classes to enhance, not distract, teaching and learning (Siau, Sheng, & Nah, 2006; Eggers, 2007). Preservice teachers need to be taught effective strategies for



technology integration and dealing with disruptions brought about by technology usage in the classroom.

Other student-related challenges identified were "I had to tell one of the students to get off his phone and call on another to make sure he wasn't trying to fall asleep" (Pre-service teacher # 1). "One student was on their phone. Another student used profanity (Preservice teacher # 5). "There was a student who was on the phone and wouldn't pay attention, and another who would speak out randomly at times" (Pre-service teacher # 20).

The teacher noticed one student on her phone, so it was addressed immediately, and that problem did not occur again. Another student fell asleep, so the teacher called on them to answer a question so they could be involved in the lesson (Preservice teacher # 27).

Other comments included "the student who was constantly using her cellphone and the student that constantly interrupted me while I was speaking" (Pre-service teacher # 25). "Student on their cell phone and student not raising their hand" (Pre-service teacher # 2). "Some students wanted to veer the conversation slightly off-topic, and some students were not as engaged as others" (Pre-service teacher # 12). "Students on their phone and the combative student" (Pre-service teacher # 28).

Based on the preservice teachers' responses, they faced many challenges, including dealing with bullying, combativeness, speaking out of turn, and being on the phone during class. Therefore, preservice teachers must be adequately trained and prepared for all challenges they may encounter in the classroom.

### **Teacher-related Challenges**

In the works of Merç and Subasi (2015), classroom management challenges were classified as "teacher-based, student-based, teaching point, material-based, and cooperating teacher-based" (p. 7). In this research, the teacher-related challenges included time management, teacher planning, and keeping students engaged. According to Yussif (2021), teacher-related challenges stem from the actions the teacher takes or does not take before, during, or after teaching. The teacher can correct these challenges with help from school personnel, if and when the challenge(s) is/are escalated. This is why researchers such as Marzano (2003) indicated that for teachers to manage the classroom effectively, they have to get help and support from the administrators. The team of teachers and administrators working together leads to improved student learning. The preservice teachers in this research indicated challenges focused on time management, which is in keeping with earlier research. Merc and Subasi (2015) analyzed the journal of preservice teachers. They found the areas of classroom management in general, time management to complete the lesson successfully, and preservice teachers' well-being, including their mental and psychological health problems, to be very challenging for preservice teachers to balance. The challenges preservice teachers face get reduced when more and more time is spent in the classroom, working with mentor teachers, and learning on the job (Darling-Hammond, 2000; Thompson, 2011). One preservice teacher indicated that "some of the questions asked by the students were difficult to answer. Better preparation would have helped me be more confident in my answers" (Pre-service teacher # 17). Another teacher-related challenge indicated was "more preparation was needed on my part" (Pre-service teacher # 25). A third preservice teacher stated that "I wasn't



very prepared. The Avatar students felt they were more advanced than the scenario I was given (Preservice teacher # 11). These three preservice teachers knew that teachers need to be prepared (as indicated in Domain 1) to teach successfully. This is because proper preparation in Domain 1 leads to successful instruction and student learning in Domain 3.

### **The intersection of student and teacher-related challenges**

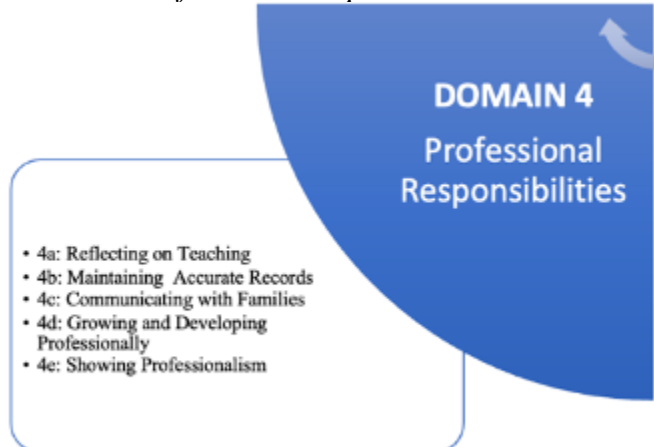
A third area of the challenge identified by preservice teachers falls at the intersection of both student and teacher-related. This is sleeping/being bored, shown in Figure 10. This challenge can result from the teacher not engaging the students effectively or the students being physically tired or unwell. In any given classroom, there are challenges to be overcome. Trained teachers anticipate challenges, plan strategies to overcome these challenges, and get students re-focused quickly when a challenge arises (Marzano et al., 2003). One preservice teacher's response to overcoming a student-related challenge was

One challenge I faced was that AVATAR (A) was trying to fall asleep in class, and she had a bit of an attitude. I made sure to keep calling on her, so she knew I paid attention. The more I interacted with her and DISCUSSED her feelings instead of DISMISSING her feeling, the more receptive she was. Another challenge I faced was when Angela made a dig at one of the other students while discussing the no-bullying policy I have. She insinuated that one of the other students and their friends bullied people. The other student was offended and there was a small discussion between those two students. I gave them a small moment to discuss it with each other, and then I intervened. I used it to make a point about how bullying isn't always so obvious. We can accidentally do it by making remarks that we think it is just funny. I also made a point that I had no problem with facilitating discussion between the students, but that we don't need to make digs at each other in the future. We can discuss, but not dig (Pre-service teacher # 6).

Furthermore, teachers have to be fully aware that some of the challenges experienced are teacher related. Therefore, Angela falling asleep could result from the preservice teacher not having an engaging lesson or Angela being tired. Conversely, this challenge could be teacher-related, as indicated by the quote, "I do not think I was prepared for this lesson in particular. I did not have any class rules prepared ahead of time to establish them in class. I only did a little bit of research..." (Pre-service teacher # 2). Therefore, the lack of preparation on the part of this preservice teacher could account for the students' boredom. Preservice teachers not knowing if this challenge was clearly teacher or student-related raised the point that preservice teachers need to be introspective in order to differentiate between student-related and teacher-related challenges (Danielson's Group, 2007). Overcoming classroom management challenges is part of a teacher's professional responsibility.

Research question 4: In what two ways did the teacher display professionalism during the lesson? (Domain 4)

The focus of Domain 4 is on Professional Responsibilities. However, this domain ripples through all the other domains, and many of the activities are "off-stage" see Figure 11.

**Figure 11***Domain 4: Professional Responsibilities*

As shown in Figure 11, teachers are expected to (a) Reflect on Teaching, (b) Maintain Accurate Records, (c) Communicate with Families, (d) Grow and Develop Professionally, and (e) Show Professionalism at all times. Even though preservice teachers are in training, they are expected to display professional responsibilities in their disposition and deportment (Teacher Education Handbook, 2021-2022). When teaching student avatars, preservice teachers were expected to show professionalism. When asked to outline two ways in which (participants) who were in the role of the teacher displayed professionalism, responses were as follows: "I made sure to be respectful of the students and was dressed appropriately" (Pre-service teacher # 1). Being respectful is part of professionalism and also a component of Domain 2, the classroom environment. In addition, appropriate attire is essential for preservice teachers entering the teaching profession. This preservice teacher demonstrated respect for students in how the preservice teacher was dressed to teach the class.

One student called me by my first name; I very respectfully told her that because I am a teacher I go by Ms. English (psudemonym) and not by my first name. This is professionalism because I established that I am not their friend, I am their teacher. Another way that I displayed professionalism was by staying composed. There were a few times that the students acted out, but I handled it by staying calm and respectful rather than getting upset or angry. For example, when the student used profanity, I did not yell at him. Instead, I used it as a teaching moment for the rest of the students by telling them that we should not use curse words in the classroom (Preservice teacher # 5).

Respect was another way professionalism was shown by preservice teacher # 5 in this situation. Re-directing the student calmly and respectfully led to a teachable moment that yielded the desired result. Similarly, another preservice teacher indicated

When AVATAR (A) told me, I had pronounced something wrong and she was going to look it up, instead of having the "I'm in charge" attitude, I let her [look it up] and we decided to change it to another word. Both words were correct but it was still nice to see her engaged in the lesson and not distracted by her phone. I even let her look up another

term I was not 100% sure about. Teachers are humans too and we make mistakes. I showed professionalism by showing respect to her. Another way is when AVATAR (J) explained what he thought "shading" was. It was not the appropriate term and instead of being pulled into that, I acknowledged his answer but quickly moved on to what the appropriate answer was. I did not give them time to goof off about it (Preservice teacher # 27).

This example showed preservice teacher #27 was confident and in control of the class. Part of growing and showing professionalism was to be calm and respectful at all times. This pleasant attitude was the epitome of success because the preservice teacher was not distracted and could deliver instruction professionally. Displaying appropriate social cues was another way how preservice teachers showed professionalism.

I said please and thank you when asking the students to do a task. I showed professionalism by showing respect. I also stayed on task and stuck to the subject matter. I did not talk to the students about anything non-beneficial to having an engaging classroom (Preservice teacher # 23).

Preservice teachers using appropriate social cues (niceties) with students leads to such being reciprocated with students showing good manners and respect. Again having a plan leads to staying on task and this preservice teacher displayed such professionalism. Components of Domain 4 were very evident in how preservice teachers took their roles and responsibilities of teaching Mursion Avatars seriously. Preservice teachers (1) Planned and Prepared instruction; (2) Maintained a Positive Learning environment; (3) Showed up for Instruction; and (4) Maintained professional responsibilities throughout their MursionVR field experience. Thus, advocating for Mursion VR simulation is worthwhile, having implications for research and practice.

### **Advocacy, Implications for Practice, and Research**

#### **Advocacy**

Based on the impact and efficacy of using Mursion VR simulation, advocacy has been made for the further utilization of Mursion in levels one and two of preservice teachers' preparation. Mursion VR simulation training has proven successful in the military, aviation, and medicine. Now, with improved Web 3.0 technologies and access to all forms of technologies, Mursion VR simulation is cost-effective, and the scenarios are relevant for training preservice teachers. This study is worth advocating for because (1) the COVID-19 pandemic taught the world that we must monitor and adjust so that teaching and learning can continue; (2) the framework for teaching was applicable as a tool for evaluating preservice teachers' experiences with teaching avatars successfully.

This study will help aspiring or preservice teachers learn about and experience the positive efficacy of Mursion VR simulation as a teaching tool. The use of VR in preparing preservice teachers is starting to gain traction. With the plethora of technology and technological applications available to all, VR has its place in education. However, some educators are concerned that a full embrace of VR in teacher training could reduce the need for teachers in the classroom. Others view VR as simply an additional layer of entertainment. Still, others indicate VR technologies are expensive and unreliable (Byers, 2022). As educators, we must debunk such

unproven assumptions and embrace the positive effects of VR as a viable tool for preservice teachers to gain valuable teaching experience.

### **Implications for practice**

This VR research affirms that preservice teachers and educators, in general, can benefit from using VR and other Web 3.0 applications in their classrooms (Ferdig et al., 2022). An emerging literature base supports using these technologies to improve problem-solving, critical and divergent thinking, and higher-order thinking skills for today's 21<sup>st</sup> Century learners (Thompson, 2011; Lamb and Etopio, 2019). However, these skills can be challenging to teach; because of time constraints for collaborative work and lack of real-to-life opportunities to practice the social skills required, some students find these skills uninteresting. Researchers such as Bolkan (2018); Byers (2022); Cohen and Wong (2021); and Kellems et al. (2020) suggested that the investment made in utilizing VR in teacher preparation can yield significant long-term benefits for teachers and students (Mursion, 2021). For example, preservice teachers who use these VR resources for field experience will find them useful for initial training, initial lesson preparation for instruction, and many other applications within the classroom. Two barriers to using VR need to be overcome.

First, preservice teachers need access to the technology hardware to experience being immersed in the simulated classroom experience provided by Mursion. This access includes mobile devices, phones, or laptop computers with cameras that can be used to be immersed in these experiences. Mursion allows for hardware and software availability in the same technological device. Mursion does not require additional headsets for its simulated activity (Mursion, 2021).

Second, preservice teachers need the technical skills to develop and use content in the VR landscape and be able to transfer their learning to the actual classroom. Today's newest technology software and applications reduce the number of technical skills that are required (The TECH ADVOCATE, 2022). The utilization of Mursion VR simulation does not require additional storage solutions such as Dropbox, Box.com, Google Drive, and other cloud storage options (Khatel et al., 2021). The scenarios in Mursion require human-in-the-loop and preservice teachers to teach avatars in real time.

### **Implications for Research**

Using VR and AR in teacher preparation is a relatively new area of research. Thus, more research is needed to determine its potential effectiveness in supplementing preservice teachers' field experiences. Using VR in teacher preparation as a teaching method is very promising, as it has the potential to better attract more preservice teachers in teacher preparation programs, all facing low enrollments, further compounding the current teacher shortage. More research needs to be conducted about using VR simulation in preparing effective teacher candidates' who readily embrace technology usage.

## **Future Research and Limitations**

### **Future Research**

Teaching preservice teachers to use technology such as VR, mixed-virtual reality (MVR), live video modeling, and Augmented reality (AR) can be effective in today's technologically advanced society. Teaching avatars in real-time gives preservice teachers valuable teaching

experience, resulting in high-quality interactions and learning. Many preservice teachers indicated positive and engaging classroom management experiences in teaching avatars.

The researchers advocate for and posit that using VR simulation in teacher preparation is efficient and feasible for preservice and in-service teachers to use in the classroom. The current research confirms the value of VR as a viable interventional or supplemental tool to support preservice teachers' field experience training learners. The researchers advance future research to explore how VR can be used as a mainstream option for providing preservice teachers with needed training using multimodal technologies. Using such multimodal technologies can enhance and improve the lives and outcomes of preservice teachers in training to serve in the nation's schools.

### **Limitations**

This includes (1) the positive results by the preservice teachers, which may be due to the novelty of the Mursion VR simulation. The preservice teacher may pay more attention because the Mursion VR simulation was unlike anything they had experienced before. (2) Another limitation is that this was a convenient sampling of preservice teachers. This leads to the final limitation (3) generalizable data in a traditional context was not collected. Using a more diverse and larger population of teacher education programs would lead to more generalizable results. The lack of generalizable data limits the researchers' ability to make generalizable conclusions.

### **Conclusions**

21<sup>st</sup> Century technologies have opened a new frontier for supporting preservice teachers in teacher preparation programs. Our study of Mursion VR simulation helped to answer the research questions. It was found that preservice teachers had to (1) spend quality time planning and preparing lessons for avatars so that the class experience would be successful; (2) cultivate a classroom environment that was inclusive, engaging, and conducive to learning; (3) provide clear classroom instruction has to focus on student engagement to be successful, and (4) exhibit professional dispositions and responsibilities throughout the teaching experience, when working with student avatars.

With access and training, preservice teachers used and learned practical teaching skills provided in Mursion VR simulations to improve their teaching skills, provide teaching experience, and expand preservice teachers' abilities to access opportunities and experiences which interest them to improve the quality of their teaching. In addition, the Mursion VR simulation experience showed the potential for these emerging 3.0 technologies to improve the teaching experiences of preservice teachers, so when preservice teachers go into the classroom, they would have substantial teaching hours of training based on diverse scenarios.

VR has the potential to impact the way future teachers are trained. Furthermore, preservice or novice teachers with little or no teaching experience can utilize this Mursion VR simulation to begin their journey of understanding the pedagogical teaching and learning landscape. Mursion VR simulations provided a safe environment where preservice teachers could make mistakes with minimal consequences. The avatars having individual and unique personalities and responses, provided a naturalistic learning environment because the preservice teacher could not fully predict what the avatar would say or do. This capability ensured an incredibly realistic experience for the preservice teacher. VR allowed preservice teachers to build and improve their teaching skills within the classroom. Due to the integration of VR into everyday lives, educators should take full advantage of this Web 3.0 technology. Mursion VR

can be used to improve the teaching experiences of 21<sup>st</sup> Century Gen Zers, preservice teachers who are tech savvy, plugged in, and adept at using technology in all aspects of their lives.

### References

- Admiraal, A., Vugyt, V., Wilfried, A., Kranenburg, F., Koster, B., Smit, B., Weijers, S., & Lockhorst, D. (2017). Preparing preservice teachers to integrate technology into K–12 instruction: *Evaluation of a Technology-infused approach, Technology, Pedagogy and Education*, (26)1, 105-120, DOI: 10.1080/1475939X.2016.1163283
- Billingsley, G., & Scheuermann, B. (2014). Using virtual technology to enhance field experiences for special education teachers. *Teacher Education and Special Education*, 37(3), 255–272. <https://doi.org/10.1177/0888406414530413>
- Billingsley, G., Smith, S., Smith, S. & Meritt, J. (2019). A systematic literature review of using Immersive Virtual Reality Technology in Teacher Education. *Journal of Interactive Learning Research*, 30(1), 65-90. <https://www.learntechlib.org/primary/p/176261/>.
- Bolkan, J. (2018). Forecast: AR and VR headset sales to return to strong growth following lackluster 2017. *The Journal*. <https://thejournal.com/articles/2018/03/20/report-ar-and-vr-headset-sales-to-return-to-strong-growth-following-lackluster-2017.aspx>
- Burlamaqui, L., & Dong A. (2015). The Use and misuse of the concept of affordance. In Gero, J., Hanna, S. (Eds.) *Design Computing and Cognition (DCC'14)*. Springer, Cham. [https://doi.org/10.1007/978-3-319-14956-1\\_17](https://doi.org/10.1007/978-3-319-14956-1_17)
- Byers, K. (2022). The 8 most interesting EdTech trends of 2022. *Exploding topics*. <https://explodingtopics.com/blog/edtech-trends>
- Castaneda, L., Cechony, A., Bautista, A., & Pacampara, M. (2017). *All-School aggregated findings, 2016-2017, VR* <http://foundry10.org/wp-content/uploads/2018/03/All-School-Aggregated-Findings-2016-2017.pdf>
- Cohen, J., & Wong, V. (2021). *Using classroom simulators to transform teacher preparation*. <https://www.brookings.edu/blog/brown-center-chalkboard/2021/11/17/using-classroom-simulators-to-transform-teacher-preparation/>
- Corning, A. (2020). *Creating full sensory experiences: The future of AR/VR/MR/XR*. <https://www.radiantvisionsystems.com/blog/creating-full-sensory-experiences-future-ar/vr/mr/xr>
- Dalinger, T., Thomas, K., Stansberry, S., & Xiu, Y. (2020). A mixed reality simulation offers strategic practice for preservice teachers. *Computers & Education*, 144. <https://doi.org/10.1016/j.compedu.2019.103696>
- Danielson, C. (2007). (2<sup>nd</sup> Edition). *Enhancing professional practice: A framework for teaching*. ASCD Publishers
- Darling-Hammond, L. (2000). Teacher quality and student achievement. *Education Policy Analysis Archives*, 8, 1. <https://doi.org/10.14507/epaa.v8n1.2000>
- Denzin, N. K., & Lincoln, Y. S. (2008). Introduction: The discipline and practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Strategies of qualitative inquiry* (pp. 1–43). Sage Publications, Inc.
- Dewitt, P. (2011). A framework for good teaching: A conversation with Charlotte Danielson. *EducationWeek*. <https://www.edweek.org/education/opinion-a-framework-for-good-teaching-a-conversation-with-charlotte-danielson/2011/10>

- Dorsey, J. (2022). *Gen Z and tech dependency: How the youngest generation interacts differently with the digital world*. <https://jasondorsey.com/blog/gen-z-and-tech-dependency-how-the-youngest-generation-interacts-differently-with-the-digital-world/>
- Dreyfus, H., & Dreyfus, S. (1999). The Challenge of Merleau-Ponty's phenomenology of embodiment for cognitive science. In Gail W. & Honi F. H. (Eds.), *Perspectives on Embodiment, The Intersections of Nature and Culture*. (pp. 103-120). New York and London: Routledge.
- Eggers, W. D. (2007). *Government 2.0: Using technology to improve education, cut red tape, reduce gridlock, and enhance democracy*. Rowman & Littlefield.
- Evans, D. A., & Curtis, A. R. (2011). Animosity, antagonism, and avatars: Teaching conflict management in Second Life. *Journal of Nursing Education*, 50(11), pp. 653–655. *ELibrary; Medical Database; ProQuest Central*.  
<https://www.proquest.com/docview/901209431?accountid=8363&parentSessionId=tkcs3viVf%2BBSGoqzbzAegdGgZqXuy0BbbVpEVVFzK29aY%3D&pq-origsite=summon>.
- Ferdig, R., Cohen, M., Ling, E., & Hatshorne, R. (2022). Examining blockchain protocols, cryptocurrency, NFT's and other Web 3 affordances in teacher education. *Journal of Technology and Teacher Education*, 30(1), 5-19.
- Freina, L., & Ott, M. (2015). A literature review on Immersive Virtual Reality in education. state of the art and perspectives. *E-Learning and Software Education*, 7, 273-279.
- Gao, H. et al. (2021). *Digital transformations of classrooms in virtual reality*. CHI Conference on Human Factors in Computing Systems, Yokohama, 1-10
- Generation Z. (2022). *Generation-The future consumer*. Mccrindle. <https://mccrindle.com.us/insights/blog/generation-z-the-future-consumer/>
- Glaser, B. G. (1965). The constant comparative method of qualitative analysis. *Social Problems*, 12(4), 436-445
- Glaser, B. G., & Strauss, A. L. (1965). Discovery of Substantive Theory: A basic strategy underlying qualitative research. *American Behavioral Scientist*, 8(6), 5–12.  
<https://doi.org/10.1177/000276426500800602>
- Green, L., Chassereau, K., Kennedy, K., & Schriver, M. (2013). Where technology and science Collide: A co-teaching experience between middle grades science methods and instructional technology faculty. *Journal of Technology and Teacher Education*. 21(4), 385-408
- Guba, E., & Lincoln, Y. (1988). Do inquiry paradigms imply inquiry methodologies? In D. M. Fettermen (Ed.), *Qualitative approaches to evaluation in education: The silence scientific revolution*. (pp. 89-115). New York: Praeger
- Hughes, C. E., Nagendran, A., Dieker, L. A., Hynes, M. C., Welch, G. C. (2015). Applications of avatar mediated interaction to teaching, training, job skills, and wellness. In G. Brunnett et al. (Eds.), *Virtual Realities* (133-146). Switzerland: Springer International Publishing.
- Johnson-Glenberg, M. (2019). The necessary nine. Design principles for embodied VR and active stem education. In P. Diaz et al. (eds.), *Learning in a digital world*. Springer, 83-112
- Kellems, R. O., Charlton, C., Kjartan Skogly Kversøy, & Györi, M. (2020). Exploring the use of virtual characters (Avatars), live animation, and augmented reality to teach social skills to individuals with autism. *Multimodal Technologies and Interaction*, 4(3), 48.  
<https://doi.org/10.3390/mti4030048>

- Kettler, R. J., & Reddy, L. A. (2019). Using observational assessment to inform professional development decisions: Alternative scoring for the Danielson framework for teaching. *Assessment for Effective Intervention, 44*(2), 69–80. <https://doi.org/10.1177/1534508417745628>
- Khatal, S., Rane, J., Patel, D., Patel, P., Busnel, Y. (2021). FileShare: A Blockchain and IPFS framework for secure file sharing and data provenance. In: Patnaik, S., Yang, X.S., Sethi, I. (eds) *Advances in Machine Learning and Computational Intelligence. Algorithms for Intelligent Systems*. Springer, Singapore. [https://doi.org/10.1007/978-981-15-5243-4\\_79](https://doi.org/10.1007/978-981-15-5243-4_79)
- Kirsh, D. (2009). Problem-solving and situated cognition. In Robbins, P. & Aydede, M., (Eds.), *The Cambridge Handbook of Situated Cognition* (pp. 264-306). New York: Cambridge University Press
- Kock, N. (2004). The Psychobiological Model: Towards a New Theory of Computer-Mediated Communication-Based on Darwinian Evolution. *Organization Science, 15*(3), 327-348.
- Kock, N. (2005). Media richness or media naturalness? The evolution of our biological communication apparatus and its influence on our behavior toward e-communication tools. *IEEE Transactions on Professional Communication, 48*(2), 117-130.
- Kolitz, D. (2021). Is there VR for senses other than sight? <https://gizmodo.com/is-there-vr-for-senses-other-than-sight-1846618969>
- Lamb, R. & Etopio, E. (2019). *Preservice Science Teacher Preparation Using Virtual Reality*. In K. Graziano (Ed.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 162-167).
- Lamkin, P. (2017). Virtual reality headset sales hit 1 million. *Forbes*. <https://www.forbes.com/sites/paullamkin/2017/11/30/virtual-reality-headset-sales-hit-1-million/#1f0747712b61>
- Lily, L., (2016). The STEM Teacher Shortage: A Case Study on Recruitment and Retention in Two California Counties. *Dissertations, 39*. [https://digitalcommons.umassglobal.edu/\\_dissertations/39](https://digitalcommons.umassglobal.edu/_dissertations/39)
- Lincoln, Y. & Guba, E. (1985). *Naturalistic Inquiry*. California: SAGE
- Marzano, R. J., Waters, T., & McNulty, B. A. (2005). *School leadership that works: From research to results*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Marzano, R. J., Marzano, J. S., & Pickering, D. J. (2003). *Classroom management that works: Research-based strategies for every teacher*. New York: Pearson Education.
- Merç, A. & Subaşı, G. (2015). Classroom management problems and coping strategies of Turkish student EFL teachers. *Turkish Online Journal of Qualitative Inquiry, 6*(1), 39-71. DOI: 10.17569/tojqi.41736
- Mursion (2021). *Mursion simulation delivery approach*. <https://info.mursion.com/simulation-delivery-approach>
- Murphy, K. & Kellinger, J. (2017). At first, I was really nervous: Integrating mixed reality simulations into urban preservice teacher coursework. In P. Resta & S. Smith (Eds.), *Proceedings of Society for Information Technology & Teacher Education International Conference* (pp. 1722-1726). Austin, TX, United States: Association for the Advancement of Computing in Education (AACE). <https://www.learnedtechlib.org/primary/p/177453/>.
- O'Connor, M., Stowe, J., Potocnik, J., Giannotti, N., Murphy, S., Rainford, L., (2020). 3D



- virtual reality simulation in radiography education. *The Students' Experience. Radiography*, 27(1), 1-9.
- Orland, K. (2017, November 28). VR headset sales are slowly rising out of the doldrums. *Ars Technica*. Available at <https://arstechnica.com/gaming/2017/11/more-than-a-fad-vr-headset-sales-are-slowly-creeping-higher/>
- Pazilah, F., Hashim, H. & Yunus, M. (2019). Using Technology in ESL Classroom: Highlights and Challenges. *Creative Education*, 10, 3205-3212. doi:10.4236/ce.2019.1012244.
- Penny, S. (2017). *Making sense: Cognition, computing, art, and embodiment*. Cambridge: MIT.
- Petrock, V. (2021). U.S. Generation Z technology and media use what usage looks like for the first generation with 24/7 access to connected devices. *Insider Intelligence eMarketer*. <https://www.emarketer.com/content/us-generation-z-technology-and-media-use>
- Reddy, A., Dudek, C., & Fabiano, G. (2015) Measuring teacher self-report on classroom practices: Construct validity and reliability of the classroom strategies scale – teacher form. *School Psychology Quarterly*, 30(4), 513-53. <http://dx.doi.org/10.1037/spq0000110>
- Roberts, S. (2011). Applied evolutionary psychology. *Oxford Scholarship online*. DOI: 10.1093/acprof:oso/9780199586073.001.0001
- Sanders, J. (1999). Affordances: An ecological approach to first philosophy. In Gail Weiss and Honi Fern Haber (Ed.), *Perspectives on Embodiment: the intersections of nature and culture* (pp. 121-142). New York and London: Routledge.
- Sasaki, R., Goff, W., Dowsett, A., Paroissien, D., Matthies, J., Di Iorio, C., Montey, S., Rowe, S. & Puddy, G. (2020). The practicum experience during Covid-19 – Supporting pre-service teachers practicum experience through a simulated classroom. *Journal of Technology and Teacher Education*, 28(2), 329-339.
- Schroeter, T., Tiede, J. & Latoschik, M. (2021). Fostering teacher educator technology competencies (TETCs) in and with Virtual Reality. A Case Study. In T. Bastiaens (Ed.), *Proceedings of EdMedia + Innovate Learning* (pp. 617-629). United States: Association for the Advancement of Computing in Education (AACE). <https://www.learntechlib.org/primary/p/219718/>.
- Shin, D. (2018). Empathy and embodied experience in virtual environment: To what extent can virtual reality stimulate empathy and embodied experience? *Computers in Human Behavior*, 78, 64-73.
- Siau, K., Sheng, H., & Nah, F. H. (2006). Use of a classroom response system to enhance classroom interactivity. *IEEE Transactions on Education*, 49(3), 398-403.
- Sugand, K., Akhtar, K., Khatri, C., Cobb, J. & Gupte, C. (2015) Training effect of a virtual reality haptics-enabled dynamic hip screw simulator, *Acta Orthopaedica*, 86(6), 695-701, DOI:10.3109/17453674.2015.1071111
- Taylor, H. (2017). More than one million VR headsets sold last quarter. *Gamesindustry.biz*. <https://www.gamesindustry.biz/articles/2017-11-28-vr-headset-sales-exceed-one-million-units-last-quarter>
- Teacher Education Handbook (2021-2022). [https://www.astate.edu/a/prof-ed-programs-office/files/Fall-2021/2021-2022TeacherEducationHandbook\\_revised.pdf](https://www.astate.edu/a/prof-ed-programs-office/files/Fall-2021/2021-2022TeacherEducationHandbook_revised.pdf)
- The TECH EDVOCATE (2022). *Why E-Learning is key to building disaster-proof education*.

- Retrieved from <https://www.thetechedvocate.org/>
- Thompson, M. (2011). Making virtual reality a reality in today's classrooms. *THE Journal. Transforming Education Through Technology*. <https://thejournal.com/articles/2018/01/11/making-virtual-reality-a-reality-in-todays-classrooms.aspx>
- Yu, X., Xie, Z., Yu, Y., Lee, J., Vazquez-Guardado, A., Luan, H., Ruban, J., Ning, X., Akhtar, A., Li, D., Ji, B., Liu, Y., Sun, R., Cao, J., Huo, Q., Zhong, Y., Lee, C., Kim, S., Gutruf, P., Zhang, C., Xue, Y., Guo, Q., Chempakasseril, A., Tian, P., Lu, W., Jeong, J., Yu, Y., Cornman, J., Tan, C., Kim, B., Lee, K., Feng, X., Huang, Y., & Rogers, J. (2019). Skin-integrated wireless haptic interfaces for virtual and augmented reality. *Nature*, 2019. DOI: 10.1038/s41586-019-1687-0
- Yussif, U. (2021). *Three major classroom management problems*. Available at <https://classroommanagementexpert.com/blog/understanding-classroom-management-problems/>

## **Gifted and Talented Students and Teachers' Perceptions of Effective Teaching Strategies and Engagement**

Emma Riemenschneider, George Junior High School, AR  
Betsy Orr, University of Arkansas  
Sheri Deaton, University of Arkansas

### **Abstract**

This study aimed to determine what types of teaching strategies most engage gifted and talented (GT) students. This study asks, "How can classroom teachers engage gifted and talented students while not advancing past the abilities of non-gifted and talented students?" Two surveys were developed and administered to public school teachers and students. The teacher participants of this study were nine classroom teachers at a junior high school in the northwestern part of the state. The student participants of this study were ninety-nine seventh and eighth graders at a junior high school in the northwest part of the state. The teacher participants were asked questions about current methods to differentiate curriculum and instruction for GT learners. The student participants were asked questions to determine their preferred classroom learning and environment. The teacher survey revealed that GT students typically do not receive specialized instruction outside their GT programs. This means that a student could potentially go all but one hour of the day without engagement, which has serious repercussions on learning and retention. In the regular classroom, there are some difficulties teaching, engaging, and assessing the growth of GT students. The student survey results indicated that most students prefer more creative and group projects and assignments and that GT students are often unintentionally alienated by their teachers and peers.

### **Introduction**

Who are gifted learners? Gifted learners "demonstrate outstanding levels of aptitude or competence in one or more domains" (Conklin, 2015, p. 16). The National Association for Gifted Children Position Statement defines giftedness that guides best practice as "a group of students high-ability students [that are] challenged at levels not reflecting their current performance or their capabilities" (Callahan, Moon, Oh, Azano & Hailey, 2015, p. 4). Gifted students might also be considered "those exhibiting superior performance in a particular domain relative to peers" (Worrell, Subotnik, Olszewski-Kubilius & Dixson, 2019, p. 552). Barbara Clark, a researcher in the field, considers giftedness "the brain's ability to integrate functions in an accelerated manner and is expressed through cognition, creativity, academics, leadership, visual arts, or performing arts" (Conklin, 2015, p.13).

Gifted students at the high school level are far less likely to remain engaged in a more extensive and generalized classroom. As a result, they can sometimes feel isolated socially and alone (Vidergor & Harris, 2015). Gifted and talented (GT) students find 40 to 50 percent of their content redundant in the traditional classroom (Callahan, et al., 2015).

GT students learn faster and at a more in-depth level than other students (Conklin, 2015) and are sometimes not intellectually stimulated in class. Their ability to problem solve and develop new ideas is not used as often as it should be. A term to describe this occurrence is "gifted underachievement," the difference between the gifted student's potential and actual performance. Additionally, this disinterest in learning can adversely affect student

self-image and create low self-esteem (Bennett-Rappel & Northcote, 2016, pp. 407-409).

Engaging gifted students should be done with supplemental materials and various texts, and relevant skills and knowledge should be included in the curriculum. Students should be encouraged to grow in their cognitive skills and other skills (Lee, 2018). To ensure that gifted students receive instruction to meet their individual learning needs, advanced and accelerated materials, projects and research methods, and in-depth creativity should be used and encouraged the classroom (VanTassel-Baske, 2013).

## **Methodology**

### **Purpose and Significance of the Study**

This study aimed to examine the perspective of GT teachers and students on the methodology that is most engaging in the classroom. The research looked at two perspectives, students and teachers, to determine what changes can be made in a general education classroom to engage GT students. The research questions asked were:

Teacher Questions: (1) What is the biggest difference between instruction to GT students and instruction to non-gifted students? (2) How do you gauge GT student engagement and retention, and is that different from how you approach that of non-gifted students? (3) Is there a specific issue that you think hinders the learning capabilities of GT students in a regular, public-school classroom?

Student Questions: (1) What types of activities in your class are most engaging? (2) What do you like most about learning in the classroom? (3) What do you dislike most about learning in the classroom?

### **Survey Instrument**

Two different surveys were developed and administered. The teacher survey was developed to determine what instructional strategy is most effective for GT students from a teacher's perspective. The student survey was designed to identify the most engaging classroom activities for students. The surveys took approximately two minutes to complete. A pilot study was conducted at a junior-high school with three classroom teachers and three class sections taught by those teachers.

### **Participants**

All participants were from the northwestern part of the state in the southeastern United States. This study utilized a convenience sample of ninety-nine eighth-grade junior high students and nine GT teachers from a school where the researcher had built a working relationship. The teachers were all experienced teachers ranging from four years of teaching experience to 25.5 years of teaching experience. Once parental permission forms were collected, students accessed the survey using a pre-determined URL given to them by their classroom teacher. All students and teachers who were invited to participate in the study chose to participate. Participant responses were confidential and anonymous.

## **Results of Teacher Data**

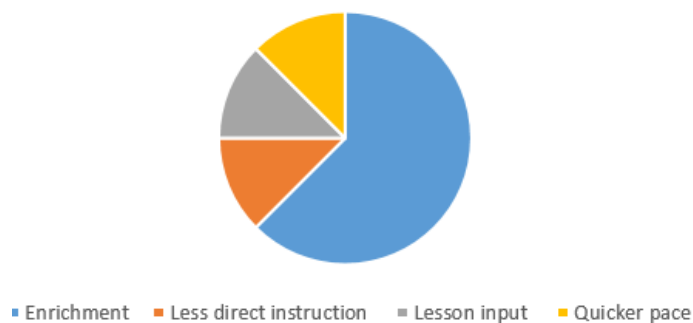
This section provides an analysis of data collected from the participating teachers in the school.

Question 1. What is the biggest difference between instruction to GT students and instruction to non-gifted students?

The teachers were asked to describe their perspective on the difference between instruction to GT and non-gifted and talented students. Enrichment was the most significant difference as reported by five (55.6%) teachers. The remaining categories had one teacher each, reporting: less direct instruction, student lesson input, and a quicker pace. Comments from the teachers included “GT students typically think outside the box” and “GT students need higher-order questioning and critical thinking.” One teacher shared that “the GT students finish their work so quickly that they need enrichment, which is difficult to provide.” Figure 1 below illustrates the data reported by the teachers.

**Figure 1**

*Biggest Difference Between Instruction for GT Students and Non-GT Students*

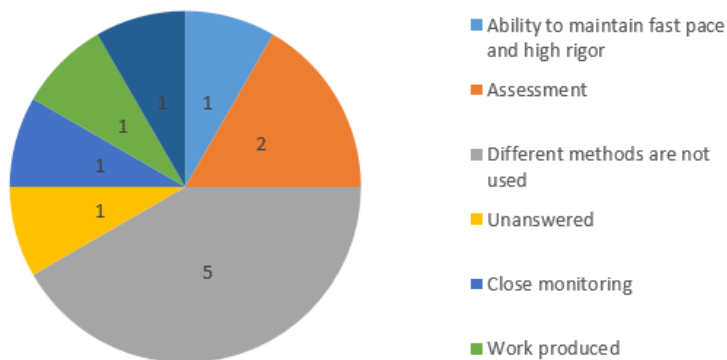


Question 2. How do you gauge GT student engagement and retention, and is that different from how you approach that of non-gifted students?

As illustrated in Figure 2, teachers were asked to explain their methods of gauging the engagement and retention of their GT students. Of the nine teachers that responded, five (55.55%) of teachers said that they do not use different methods; two (22.22%) said assessment; one (11.11%) said the student's ability to maintain a fast pace and high rigor; one (11.11%) said close monitoring; one (11.11%) said work produced; one (11.11%) said student input; and one (11.11%) did not answer. One teacher stated, “Retention of GT students and non-GT students is gauged the same way. However, it is more difficult to meet the level of engagement GT students need.”

## Figure 2

*How Do You Gauge Gifted and Talented Student Engagement and Retention, and is that Different Than How You Approach That of non-Gifted and Talented Students?*

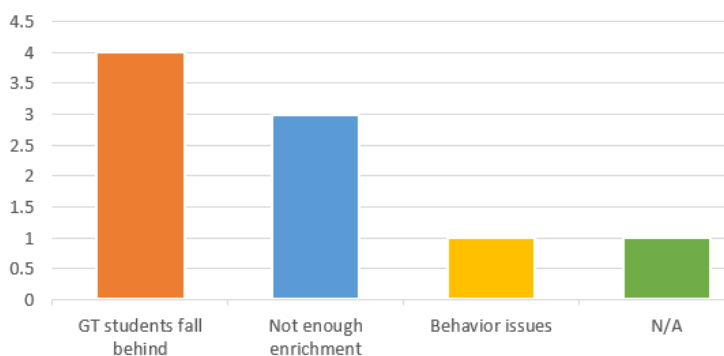


Question 3. Is there a specific issue that you think hinders the learning capabilities of GT students in a regular, public-school classroom?

GT teachers provided a variety of responses when asked if there was a specific issue that hinders the learning capabilities of GT students in a regular, public-school classroom. The teachers provided a variety of descriptions about obstacles GT students face. Four (44.44%) said GT students fall behind because of their pullout classes; three (33.33%) said there is not enough enrichment; one (11.11%) said overall behavioral issues keep GT [and all other] students from learning; one (11.11%) did not answer. One teacher that believes GT students are missing out on enrichment said, "If I teach to the majority or middle, adding rigor for those [GT students] is difficult. It makes it look as if they are getting more work instead of more challenging work." Another said, "I think that there are times that these [GT] students are not being challenged for growth." A chart below (Figure 3) illustrates the data reported.

## Figure 3

*Is There a Specific Issue That You Think Hinders the Learning Capabilities of Gifted and Talented Students in a Regular, Public-School Classroom?*



## Results of Student Data

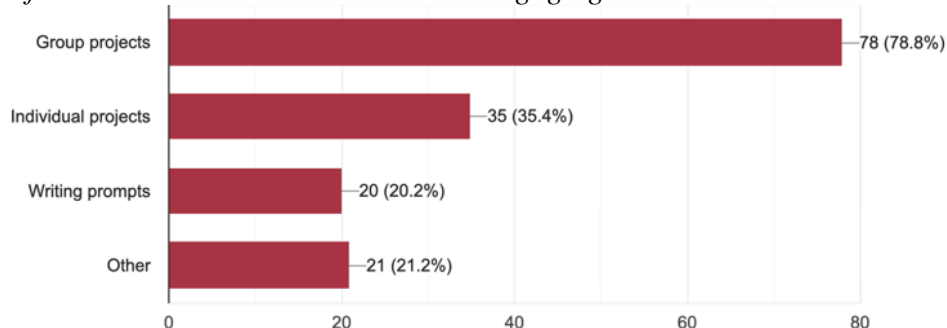
This section provides an analysis of data collected from the participating students in the school.

Question 1. What types of activities in your class are most engaging?

Mixed-ability students thrive in various environments with different circumstances. Seventy-eight (78.8%) of the students chose group projects; 35.4% ( $N=35$ ) chose selected individual projects; 20.2% ( $N=20$ ) selected writing prompts; and, finally, 21.2% ( $N=21$ ) chose Other (see Figure 4). The students who chose “Other” provided responses such as experiments, interactive projects, games, discussion, and research. For example, one GT student said, “Often in GT class we have fun discussions that go along with the topic we’re learning about; group projects are the most engaging for me.”

**Figure 4**

*What Types of Activities in Your Class Are Most Engaging?*



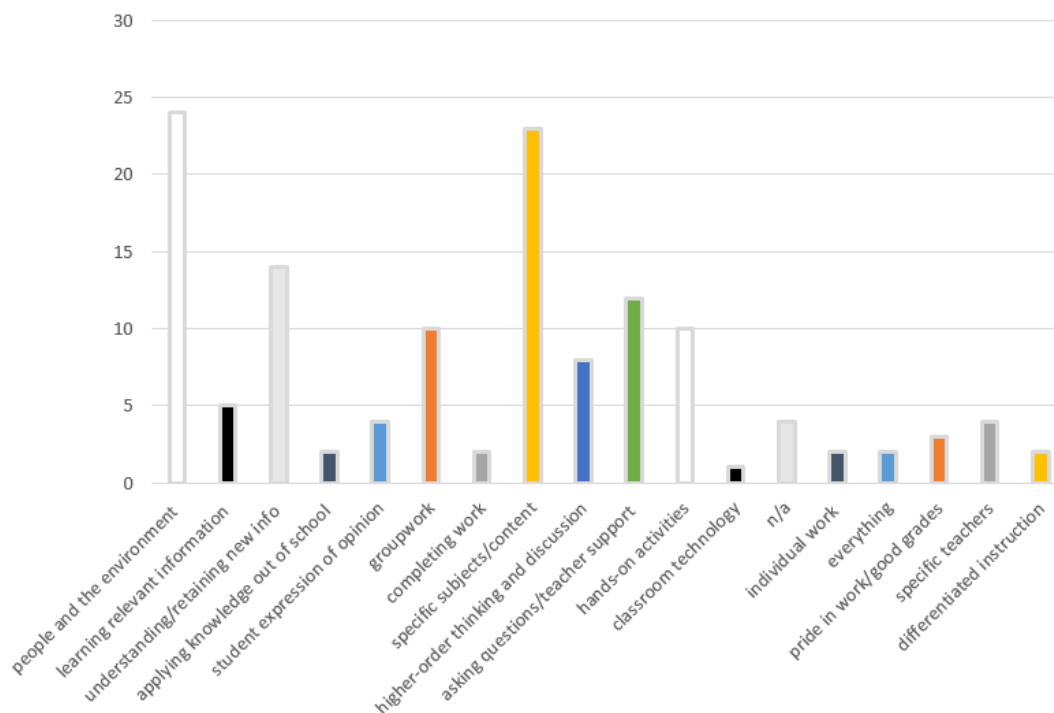
Question 2. What do you like most about learning in the classroom?

The students were asked to submit a short answer to “What do you like most about learning in the classroom?” Several students interpreted this as opposed to virtual learning, but the responses were relevant, nonetheless. Twenty-four (24.4%) students said people and environment were what they most liked about learning. This was followed by specific subjects or content, with 23.3% ( $N=23$ ) of the students reporting this was what they liked most about learning. One student noted, “My classroom has great peers and a great environment, so we can get pretty lively at times, making the already fun learning process even more fun.” The distribution varied, with 12% ( $N=12$ ) of students stating asking questions or having teacher support was what they liked most. Additionally, 10% ( $N=10$ ) of student participants indicated group work and hands-on activities, answering higher-order thinking and discussion. The remaining distribution was specific teachers, student expressions of opinion, and pride in work. For example, one student shared, “I like knowing answers and understanding work. I also like applying my knowledge from learning when I am outside of school.” Another positive student responded, “My classroom has great peers and a great environment so we can get pretty lively at times, which always makes the already fun learning process even more fun.”

Figure 5 below illustrates students’ responses on what they like most about learning in the classroom.

**Figure 5**

*What Do You Like Most About Learning in the Classroom?*



### Question 3. What do you dislike most about learning in the classroom?

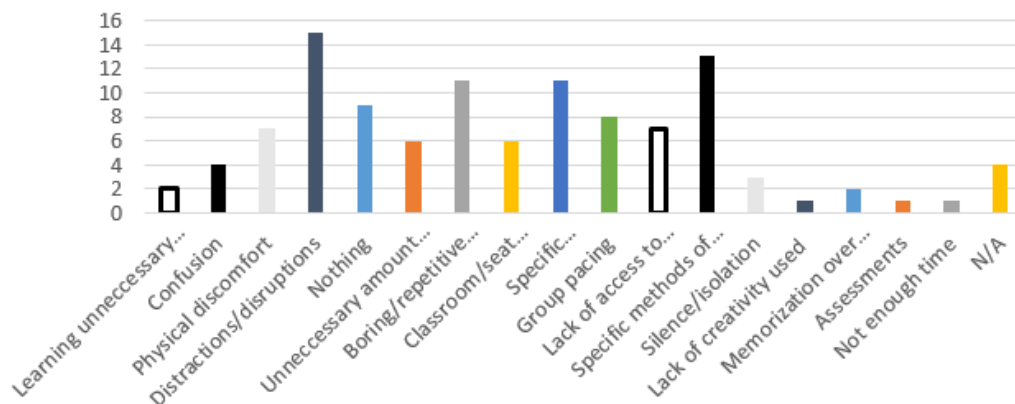
As their final survey question, the students were asked, "What do you dislike most about learning in the classroom?" As shown in Figure 6 below, fifteen (15.15%) students said distractions or disruptions; 13 (13.13%) students said specific activities or methods of instruction; 11 (11.11%) students said boring or repetitive classwork; 11 (11.11%) said specific content or subjects; nine (9.09%) students said nothing; eight (8.8%) students said group pacing; seven (7.07%) students said lack of access to help or other issues with teachers; seven (7.07%) students said physical discomfort; six (6.06%) students said confinement to their seat or the classroom; six (6.06%) of students said an unnecessary amount of work; four (4.04%) students said confusion; four (4.04%) students did not provide an answer; three (3.03%) students said silence or the isolation of doing work individually; two (2.02%) said the learning of unnecessary information; two (2.02%) students said memorization over understanding; one (1.01%) student said assessments; one (1.01%) student said the lack of creativity used; finally, one (1.01%) student said not enough time.

One student responded, "I attended the Virtual Academy for a year and a half, and it worked extremely well for me, as I was very self-directed and organized. I really enjoyed being able to work ahead of the usual pace. I miss those aspects of school and wish we were more able to work ahead and do our own research."



**Figure 6**

*What Do You Dislike Most About Learning in the Classroom?*



### Summary of Findings

The teacher survey revealed that GT students typically do not receive specialized instruction outside of their GT programs. This means that a student could potentially go all but one hour of the day without engagement, which has serious repercussions on learning and retention. In addition, according to the teacher participants, a common concern with the currently existing method of providing GT services was that GT students who leave the classroom to receive services fall behind in their regular classes.

When it comes to classroom teaching, the majority of teachers said that it poses an issue to teach GT students among non-gifted and talented students because sometimes, GT students are not engaged in regular curriculum and are not concerned with their grades; without those motivations, there is little reason to do work. Bennett-Rappel & Northcote (2016) also found that gifted students are sometimes not intellectually stimulated in class, leading to low self-esteem. One teacher even shared that usually, general education classrooms teach to the average or potentially the least capable student. Students with special needs receive services, but GT students are another demographic that needs attention. The teacher's also shared that most of the teachers cater to their GT student needs by using enrichment opportunities; specifically, teachers might challenge GT students to use more creativity on an assignment or activity. Higher-level questioning was another method revealed in the student. Teachers also reported using the same methodology, along with their discretion and assessments. To determine how their learners are progressing.

GT students face two major obstacles: falling behind in class while receiving GT services and not being provided enough enrichment in the school day. One teacher disclosed that creating content to the middle makes going above for GT students more difficult. Another issue that a teacher mentioned was that sometimes GT students are afraid of being alienated by their peers regarding their higher abilities.

The GT students who took the survey said they are offered a wide range of activities in their GT program. Interactive activities and unique subject matter were most discussed, and experiments, group work, and abstract projects were also popular. Next, in the student survey, all students were asked which activities they preferred the most. Supplemental materials and various texts were also recommended by Lee (2018). An overwhelming majority of students answered that they favored group projects, followed by individual projects, and then written projects. Students were also asked what they disliked most about learning in the classroom. The top

responses were distractions or disruptions, specific activities or methods of instruction, and boring or repetitive classwork. This is consistent with the findings of Callahan et al. (2015).

Engagement was then addressed. Just fewer than half of the students answered that they are bored in class often or more often than not. The frequently bored students shared what they believe would make class more engaging; the most common answers were curriculum or course changes, interactive activities, group projects, more or better teacher involvement, and assignment changes. Some students either did not know what change should be made or disclosed that they disliked school.

In contrast, student participants were asked their least favorite part of the classroom. Several issues that were mentioned could be solved with an integrated curriculum model: boring or repetitive work, group pacing, lack of access to teacher help, specific instructional methods or activities, memorization over understanding, and not having enough time for assignments. Other students shared qualms with physical discomfort, disruptions and distractions, and specific content or subjects.

### **Recommendations for Future Research**

The study's findings suggest that future studies should consider the school climate. Most importantly, questions like, "What do typical classes look like in this school?" and "What influence has the year's economic and social crises had on the school environment?" should be included in the survey. Additionally, the researcher should consider asking about student demographics and track those trends for more in-depth knowledge of students.

### **References**

- Bennett-Rappell, H. & Northcote, M. (2016). Underachieving gifted students: Two case studies. *Issues in Educational Research*, 26(3).
- Callahan, C. M., Moon, T. R., Oh, S., Azano, A. P., & Hailey, E. P. (2015). What works in gifted education: Documenting the effects of an integrated curricular/instructional model for gifted students. *American Educational Research Journal*, 52 (1), 137-167.  
<https://www.jstor.org/stable/24546724>.
- Conklin, W. (2015). *Differentiating the curriculum for gifted learners*.  
<http://ebookcentral.proquest.com/lib/uark-ebooks/detail.action?>
- Lee, H. (2018). *Differentiated instruction for gifted and talented students: Teaching gifted and talented students with diversity responsive education method*.  
<http://ebookcentral.proquest.com/lib/uark-ebooks/detail.action?docID=5287923>.
- VanTassel-Baska, J. (2013). Curriculum, instruction, and assessment for the Gifted: A problem-based learning scenario. *Gifted Child Today*, 36(1), 71-75.  
doi: 10.117/1076217512465289.
- Vidergor, H. E. & Harris, C. (2015). *Applied practice for educators of gifted and able learners*. Sense Publishers: The Netherlands.
- Worrell, F. C., Subotnik, R. F., Olszewski-Kubilius, P., & Dixson, D. D. (2019). Gifted students. *Annual Review of Psychology*, 70, 551-76.  
<https://doi.org/10.1146/annurev-psych-010418-102846>.

## **Understanding the Need for Collaboration in Response to Intervention in the Schools**

Melinda Salloukh, Hot Springs School District, AR

### **Abstract**

Response to Intervention (RTI) with collaboration and cross-disciplinary integration of literacy services strives to improve the education of students in the schools. RTI, a systematic method, provides opportunities for collaboration, assessment, and instruction of students, opening the door for more intensive, ongoing involvement with the education of the students. For school leaders to accomplish substantial improvement in student achievement over the next several years, they need (a) to understand the components of RTI, (b) to gather information about each child that helps educators understand the development of the child, and (c) to place appropriate and accurate data into the hands of the educators.

Experienced administrators are aware new programs alone rarely secure and sustain academic improvement. Evidence indicates that reading difficulties become apparent early in the educational process and tend to evolve into lifelong struggles with literacy. RTI offers educators a tool to improve the learning skills of the student. Educators can use this information to collaborate with teachers, speech language pathologists (SLPs) and other team members to assist students in learning skills needed academic skills.

### **Introduction**

The changes from Common Core State Standards (CCSS), Response to Intervention (RTI), and attitudes toward standards-based classrooms continue to yield a positive change (Murza & Ehren, 2015). The use of CCSS, RTI, standards-based classrooms, and high expectations for all students, is bringing changes to classrooms in the schools (Dixon et al., 2014). RTI is a three-tiered intervention initiative designed to identify and support students who are unsuccessful in academic subjects such as reading, including those who have or are at risk of having reading disabilities (Rock, 2018). RTI is also used to prevent children's reading difficulties and reading disabilities (Vaughn & Fletcher, 2012).

RTI is comprised of five fundamental components to a successful RTI program. The five fundamental components include (1) screening students, (2) monitoring students, (3) providing tier one differentiated instruction, (4) providing tier two small-group interventions, and (5) providing tier three intense individualized interventions (Jones, Yssel, & Grant, 2012). RTI is available with school staff providing collaboration to ensure that at each tier, students who are at risk are provided the opportunity to receive instruction to meet the student's needs.

Friend and Cook (1992) defined collaboration as “a style of direct interaction between at least two coequal parties voluntarily engaged in sharing decision making as they work toward a common goal” (p. 5). Since the 1970s and 1980s, school systems have been shifting to promote a more collaborative model (Rosenfield, et al., 2018). Collaboration is a critical element in the K-12 school setting, encompassing several professionals working together to benefit students. Collaboration may occur in meetings, correspondence, committees, and advocacy (Tuttle, et al., 2021). Many sources have issued the call for increased collaboration and cross-disciplinary integration of literacy services, including American Speech Language and Hearing Association (ASHA) and the International Literacy Association (ILA) (Gosse, Hoffman, & Invernizzi, 2012). Accordingly, the work within the broader context of education, such as literacy, curriculum, and

RTI, requires close collaboration with educators in the integration of literacy services (ASHA, 2010; Spracher, 2016).

### **Literature Review**

School systems are always striving to improve the education of students in the schools. There has been a gradual shift beginning in the 1970s and 1980s, as school systems have been shifting to promote a more collaborative model (Rosenfield et al., 2018). Collaboration strengthens students' school experience with SLPs and other school staff working together. Many sources have issued the call for increased collaboration and cross-disciplinary integration of literacy services, including ASHA and the International Literacy Association (ILA) (Gosse, Hoffman, & Invernizzi, 2012). Accordingly, the work within the broader context of education, such as literacy, curriculum, and RTI, requires close collaboration with educators in integrating literacy services (ASHA, 2010; Spracher, 2000). A report issued by the Committee on the Prevention of Reading Difficulties in Young Children recommends that Speech Language Pathologists (SLP) collaborate with reading professionals through early identification and coordinated instruction (Gosse, Hoffman, & Invernizzi, 2012).

Gosse, Hoffman, & Invernizzi (2012) further noted that ASHA recommends that SLPs should be working closely with reading specialists, literacy coaches, and special education teachers because all these professionals contribute essential roles in changing the trajectory of national literacy trends. These specialized groups provide the foundation for collaboration. Working with administrators, teachers, and support services personnel is equally important to identify and meet students' needs (ASHA, 2010). Collaborative models have become a need in schools, as there has also been a shift in educator training programs to provide more specialized fields (Rosenfield et al., 2018).

Furthermore, blending knowledge, perspectives, and experiences to create new knowledge has been highlighted as an essential part of the genuine collaboration (Wilson, McNeill, & Gillon, 2015). Therefore, SLPs must work effectively and collegially with many different constituencies within the school and the broader community to bring to the effort the unique contributions for which their academic programs have prepared them (ASHA, 2010). Partnerships with parents/guardians and the students are also a focus, with specific requirements driven by IDEA (ASHA, 2010).

With the increased challenges of the CCSS, work in schools requires SLPs to partner with others to meet the student's needs (Ehren, et al., 2012). Ehren, et al. (2012) further noted that the shared responsibility among educators has tailor-made opportunities for teachers and SLPs to combine their expertise and experience to create high-quality instruction. Teachers and SLPs have different but complementary skills that contribute to developing a child's language and learning (Glover, McCormack, & Smith-Tamaray, 2015). Glover, McCormack, & Smith-Tamaray (2015) noted that teacher knowledge and skills relate to the curriculum, literacy, and teaching practice, but SLPs take a linguistically analytical approach to language.

Glover, McCormack, & Smith-Tamaray (2015) completed a mixed-methods research design study to investigate the needs of teachers and SLPs and their preferences for service delivery when working with primary school-aged children. This study had two phases (Glover, McCormack, & Smith-Tamaray, 2015). In Phase One, all teachers (Schools n = 16) and SLPs (n = 36) were invited to complete a questionnaire with responses obtained from 14 teachers and 6 SLPs (Glover, McCormack, & Smith-Tamaray, 2015).

In the second phase, a subsample of participants ( $n = 4$ ) contributed to a focus group (Glover, McCormack, & Smith-Tamaray, 2015). Glover, McCormack, & Smith-Tamaray (2015) noted that teachers and SLPs expressed a desire for increased training and more collaborative practice. The teachers and SLPs also voiced frustration at perceived systemic inadequacies concerning funding, personnel, and resources (Glover, McCormack, & Smith-Tamaray, 2015). Glover, McCormack, & Smith-Tamaray (2015) note that this study's results suggest that a service delivery change needs to be considered at an individual, interpersonal and organizational level. Changes to the service delivery model will produce better outcomes for children with speech and language disorders and increase support from their families and the professionals that work with them (Glover, McCormack, & Smith-Tamara., 2015).

SLPs often question their role in supporting students who have not formally qualified via IDEA for speech or language services but might still exhibit weaknesses in speech/language, emergent literacy, or early phonics development (Foster & Miller, 2007). Foster and Miller (2007) noted that one strategy SLPs in public schools is to provide instruction in classrooms containing at least one IDEA-identified student. Foster and Miller (2007) report that many clinicians work to cluster students with speech and language disorders into one or more classrooms and provide the instruction to the entire class, considering this a form of inclusion.

In either case, Foster and Miller (2007) note that clinicians feel they are reaching many potentially disabled or low-literacy-readiness students through complete classroom instruction. This approach was believed to be important because SLPs often question their role in supporting students who have not formally qualified for speech or language services but might still exhibit weaknesses in speech/language, emergent literacy, or early phonetics development (Foster & Miller, 2007). As a form of inclusion, SLPs in the classroom work to cluster their students and provide instruction to the entire class (Foster & Miller, 2007).

Wilson, McNeill, & Gillon (2016) noted an increased emphasis on creating classroom instruction to meet the diverse learning needs of all students. Wilson, McNeill, & Gillon (2016) further observed that the political and philosophical shifts toward a more integrated and inclusive form of education had provided classroom instructions to meet these diverse learning needs of all students. Collaboration works transformatively with students to support specific needs including advocating for student rights (Tuttle, et al., 2021).

The increase in collaboration and inclusion is based on a national survey that reported low rates of classroom-based work (Wilson, McNeill, & Gillon, 2016). The study by Wilson, McNeill, & Gillon (2016) refers to a study that was completed by Brandel & Loeb (2011).

Brandel and Loeb (2011) completed a study through an online survey with almost 2,000 SLPs responding. The study examined the student, SLP, and workplace characteristics that may influence the SLPs' recommendations (Brandel & Loeb, 2011). However, these same SLPs reported that current students on their caseload with severe to moderate disabilities participated in interventions 2-3 times a week for 20-30 minutes in groups outside the classroom (Brandel & Loeb, 2011). The students with the least severe disability received intervention once a week for 20-30 minutes in groups outside the classroom (Brandel & Loeb, 2011).

Brandel and Loeb (2011) reported that student characteristics, rather than SLP or workplace characteristics, were the factors they considered the most when making these recommendations. The researchers concluded that the limited variety of intervention program intensities and service delivery models suggests that student characteristics may not be the most critical factor when making intervention recommendations (Brandel & Loeb, 2011). Brandel and Loeb (2011) concluded that caseload size and years of practice appear to influence SLPs'

recommendations regarding program intensity and service delivery models. Collaborative efforts for the CCSS can occur in various instructional settings to address diverse student needs and are compatible with RTI frameworks and other service delivery models (Ehren, et al., 2012; Reed, 2013).

The SLP works with the teacher to develop classroom techniques, implement the standards, and assist with differentiated instruction for students at different proficiency levels across the standards (Ehren, et al., 2012). Therefore, as collaboration is integral to supporting the child's communication, social, emotional, and academic development, SLPs must work with teachers, other professionals, and parents to meet the learners' needs (Wium & Louw, 2013).

Providing resources and support is vital as children learn differently. Therefore, teachers must utilize various strategies to adapt lessons and efficiently plan to cater to all students' learning abilities (Boyle, et al., 2011). The cognitive strategies implemented in the classroom are designed to promote independent student thinking (Boyle, et al., 2011).

The first step of providing services in the classroom involves building a collaborative working relationship between two professionals (Vicker, 2013). The benefits of collaboration include: (a) consistency of approach, (b) transfer, and (c) sharing of knowledge and skills among professionals (Glover, McCormack, & Smith-Tamaray, 2015). Vicker (2013) noted that consultation is one method SLPs may initially use in working with a teacher or a team within a classroom focus.

The collaborative role opens the doors for a more intensive, ongoing involvement with the education of the students (Vicker, 2013). The team can focus on improving communication support in many curricular areas for all students: (a) at the core level of instruction, (b) targeting skills for a select group of students, or (c) focusing on students with specific challenges. In all three areas, the students could benefit from the experience and skills of an SLP (Vicker, 2013). Collaboration is a two-way process that requires teachers and SLPs to discuss specific learners, learning objectives, and how these can be achieved as well as sharing knowledge and expertise in the planning and assessment of learners (Wium & Louw, 2013).

Evidence indicates that reading difficulties become apparent early in the educational process and tend to evolve into persistent, lifelong struggles with literacy (Graves, Brandon, Duesbery, et al., 2011). The quasi-experimental study that Graves, et al. (2011) completed examined the RTI Tier 2 evidence-based intensive reading instruction for sixth-grade students with and without learning disabilities who were below the basic literacy level. Graves, et al. (2011) also explored the development of the response-to-intervention model in middle school.

The study occurred in a large inner-city urban setting, where 100% of the students received free lunch, and 90% were considered English learners at some point in their school history (Graves, et al., 2011). Graves, et al. (2011) noted that the students received intensive small-group instruction and intervention for thirty hours across ten weeks. Credential candidates in special education provided small-group instruction in the treatment condition (Graves, et al, 2011).

Results on oral reading fluency indicated more significant improvements for treatment students, and students with learning disabilities benefited as much or more than the other struggling sixth graders (Graves et al., 2011). Graves et al. (2011) suggest that students benefit from intensive small-group instruction in phonemic awareness, decoding, fluency building, reading comprehension, and vocabulary enrichment. Explicit instruction with strategic reading and writing exercises should be incorporated into daily lessons and can be enhanced by including progress monitoring (Graves et al., 2011).

RTI is a general education initiative that takes place before placement in special education (Hazelkorn, et al., 2011). The RTI model provides an opportunity to work with children deemed at risk in the academic area, assess their needs, and apply theoretically sound evidence-based treatment to learning (Kerins, Trotter, & Schoenbrodt, 2010). The three tiers represent increasingly intensive interventions for struggling readers or students with reading disabilities (Denton et al., 2013)

RTI was derived from the reauthorization of IDEA in 2004 (Greenfield, et al., 2010) and represents a model that focuses on prevention, identification, and intervention (Sanger, et al., 2012). Sanger et al. (2012) note that it is critical for SLPs and other educators to collaborate, plan and implement RTI for students who struggle and are identified as at-risk and performing below expected grade levels. RTI is used as part of an evaluation model for identifying students with specific learning disabilities (Sanger, et al., 2012). Therefore, the three-tiered RTI identification procedures must be conducted as early in a child's education as possible (Catts, et al., 2015).

The first two tiers of RTI require general education teachers to use research-based instruction with all students and then evaluate the effectiveness of that instruction (Hazelkorn, et al., 2011). In theory, this system of academic interventions and assessment is designed to serve two principal purposes: prevention of academic failure and diagnosis of learning disabilities (King, et al., 2012). It is critical that during the RTI process, students at risk for reading disabilities are identified early and accurately (Catts, et al., 2015).

No Child Left Behind (NCLB) (2001) legislation stated that schools must employ "highly qualified" teachers, as well as requiring schools to have all students meet academic standards (Greenfield, et al., 2010). Not long after the passing of NCLB (2001), additional federal reform came through the 2004 reauthorization of the IDEA (Greenfield, et al., 2010). IDEA (2006) allows local education agencies to discontinue the ability-achievement discrepancy method and instead use RTI as part of the evaluation procedure for identifying students with specific learning disabilities (Graves, et al., 2011; Hazelkorn, et al., 2011).

The original goal of RTI was to reduce the number of students identified for special education services, primarily for reading problems (Hazelkorn, et al., 2011). Since the Education for All Handicapped Children Act (1975) passage, the definition and identification of children with high incidence disabilities have remained subjective (Hazelkorn, et al., 2011). The subjectivity has led to the emergence of two trends including the dramatic increase of students identified as having learning disabilities and the higher percentages of minorities in special education than those found in the general population (Hazelkorn, et al., 2011). In response, alternative methods were suggested to ensure the accurate and efficient identification of students with disabilities (Hazelkorn, et al., 2011). Evidence shows that screening students as early as kindergarten or grade one, and then providing them with RTI support has led to positive reading outcomes (Catts, et al, 2015; Wanzek, et al., 2013). Denton, et al. (2014) noted that the effects of targeting students in kindergarten and grade one are more favorable than the effects of RTI in grades two and higher.

RTI is a systematic method for assessment and instruction of students which uses progress monitoring to help pinpoint students who may need intervention (Peck & Scarpati, 2007). The students who are identified in special education services are primarily due to reading problems and may benefit from RTI (Hazelkorn, et al., 2011). The RTI approach has gained significant exposure as the preferred alternative to special education because of the systematic method for assessment and instruction of students, which uses progress monitoring to help pinpoint students who may need intervention (Hazelkorn, et al., 2011). Graves, et al. (2011) note

that the RTI approach suggests that general education and special education teachers work together to systematically assess problems and intervene as part of the general education cycle.

The goal of the multi-tiered model is prevention and early intervention to minimize failure in otherwise groups of children at risk for learning disabilities (Kerins, et al., 2010). RTI is a data-driven decision-making model that has the potential to provide continuous feedback about students in ways that have instructional implications (Hazelkorn, et al., 2011). RTI provides tiers of evidence-based instruction through which students move based on their level of academic needs (King, et al., 2012). The RTI model is multi-tiered with at least three tiers (Hazelkorn, et al., 2011) to prevent academic failure (King, et al., 2012).

King, Lemons, & Hill (2012) provided a summary of research conducted at the secondary level and included a set of considerations for secondary administrators regarding RTI implementation. In secondary schools, the need for effective models of delivering the intervention to struggling readers is alarmingly apparent (King, Lemons, & Hill, 2012). Two large-scale studies have assessed the effectiveness of RTI in middle schools throughout multiple school years (King, Lemons, & Hill, 2012). One study conducted by Vaughn, et al. (2010) tested a standard protocol model of RTI in seven urban middle schools in the southwestern United States (as cited in King, Lemons, & Hill, 2012). In the study, sixth-grade teachers received professional development concerning vocabulary and comprehension instruction to ensure adequate Tier 1 instruction (King, Lemons, & Hill, 2012).

Vaughn, et al. (2010) used state test scores to assign 241 struggling students to a Tier 2 intervention involving standardized small-group instruction in vocabulary, fluency, and comprehension for 50 minutes a day throughout the school year. The student receiving Tier 2 instruction exhibited more significant gains on the measure of literacy skills than students in a comparison condition (King, Lemons, & Hill, 2012).

King, Lemons, & Hill (2012) reported that two supplemental literacy programs were implemented with ninth graders who had been identified by the participating schools ( $n = 34$ ) as reading 2 to 5 years below grade level. The researchers randomly assigned students ( $n = 5,595$ ) to one of two experimental interventions or a control condition (King, Lemons, & Hill, 2012).

In the experimental content, teachers instituted either Reading Apprenticeship Academy Literacy or Xtreme Reading (King, Lemons, & Hill, 2012). Both interventions were designed to enhance reading comprehension, vocabulary, writing, phonics, and fluency (King, Lemons, & Hill, 2012). The students received the interventions as a substitute for an elective-level class for 225 minutes per week for one academic year at the cost of approximately \$2,000 per student (King, Lemons, & Hill, 2012). King, Lemons, & Hill (2012) reported that at the end of the ninth grade, students receiving the reading interventions demonstrated statistically significant gains in reading comprehension ( $ES = 0.09$ ), grade point average ( $ES = 0.07$ ), and on standardized English language arts tests ( $ES = 0.11$ ).

Tier 1 uses high-quality universal instruction and assessment provided to all students in the general education setting (Hazelkorn, et al., 2011; Sanger, et al., 2012). Progress is monitored, and students who fail to respond at this level are provided with more intensive supplemental instruction at Tier 2 (King, Lemons, & Hill, 2012). Students who are perceived to have or be at risk of reading disabilities during the screening process are provided with the first tier of intervention within the whole-class setting, including everyday instruction, and it is intended to be a preventative measure for reading disabilities (Rock, 2018). During tier one interventions, classroom instruction is given to all students, but differentiation is also provided to those needing support in reading (Jones, Yssel, & Grant, 2012).



The goal of tier two interventions is to accelerate the progress of struggling readers (Rock, 2018). Tier 2 contains more specialized and specific strategies used within the classroom for those students who have not progressed as expected in Tier 1 (Hazelkorn, et al., 2011; Sanger et al., 2012). When students do not respond to the first tier of intervention, they require tier two interventions, receiving more intensive, small group support (Rock, 2018). Throughout, this short-term interventionist follows a set of structured, predictable lesson plans (Rock, 2018). For some students, tier two interventions are insufficient and require even more intensive tier three support (Denton, et al., 2013).

Tier 3 is the stage at which a multidisciplinary team conducts a comprehensive assessment to learn whether the child has a disability and is eligible for special education (Hazelkorn, et al., 2011). The academic interventions became more intensive at each tier as data were collected to determine the effectiveness of the intervention (Hazelkorn, et al., 2011). Tier three interventions are not meant to be short-term; the intervention often lasts several months or even one or more school years (Denton, et al., 2013). Collier (2010) reported that in many cases, the individualized, tier three interventions accelerate children's learning so that they can eventually reach grade level requirements.

Regarding prevention, RTI addresses academic problems before they occur by ensuring that research-based general education and appropriate interventions are provided to all students (King, Lemons, & Hill, 2012). Greenfield, et al. (2010) reported in their study that federal policies to increase student achievement and improve teacher quality underlie this study. After the first year of implementation, eight elementary teachers were interviewed about how they viewed the RTI reform effort (Greenfield, et al., 2010).

The Greenfield, et al. (2010) study noted the following question as a part of the research: After the first year of implementation, how do educators view the RTI change process? Greenfield, et al. (2010) analyzed the data using a consensual qualitative methodology. The results indicated that teachers viewed the reform effort positively but expressed concerns about implementing RTI (Greenfield, et al., 2010). Greenfield, et al. (2010) noted that the majority of teachers associated the following positive outcomes with the first year of reform: (a) using data to inform instructional planning; (b) using progress monitoring to measure the effectiveness of the instruction; and (c) better knowing “when” to refer English language learners for special education services. Rock (2018) noted that while the three-tiered RTI initiative has proven successful when students are identified as struggling readers early, it also has the potential for students in grades 3-12. In summary, RTI forces schools to adopt universal screening and continuous progress monitoring while examining and refining their instructional practices and delivery options (Greenfield, et al., 2010).

The roles of SLPs in RTI have received minimal research, although researchers have described the advantages of the instructional approach for struggling students (Sanger, et al., 2012). SLPs must become more involved with RTI efforts by assisting in preventing or mitigating learning difficulties in students by ensuring that primary language and emergent literacy skills are in place so that young students are prepared to meet the CCSS (Ehren, et al., 2012). SLPs subsequently help students struggling with acquiring the CCSS across tiers (Ehren, et al., 2012). As school districts explore RTI, they will want to foster these broader roles by SLPs, who can be an invaluable resource at all levels of the RTI model (Vicker, 2013).

The language and literacy expertise of SLPs, as well as the diagnostic-prescriptive approach of SLPs, may be beneficial in Tiers 1, 2, and 3 by providing consultation, assessment, professional development, and intensive interventions (King, Lemons, & Hill, 2012). SLPs’

assistance in Tier 1 includes helping with ongoing screening, progress monitoring, assessment, and general and specialized education in a classroom setting (Sanger, et al., 2012). Roles in Tier 2 consist of specialized or evidence-based interventions through small groups, progress monitoring, and other specialists to provide ongoing curriculum-based instruction (Sanger, et al., 2012). In Tier 3, SLPs provide intensive curriculum-based interventions using various service delivery models (Sanger, et al., 2012).

This reconceptualization of the function of SLPs presents one way that school administrators can reconfigure current job responsibilities to enhance the impact of existing staff (King, Lemons, & Hill, 2012). The SLPs' services are valued for their capacity to clarify the connections between language, literacy, and academic success. These connections enable SLPs to provide helpful feedback to policy-makers and other professionals in school settings (Sanger et al., 2012).

SLPs are highly qualified to assess and provide direct and collaborative instruction for children exhibiting reading difficulties or those considered at risk for reading problems (Kerins, et al., 2010). Kerins, et al. (2010) studied 23 first-grade students with below-average reading abilities and/or poor phonemic awareness through classroom-based and standardized assessments and were randomly divided into two groups. Kerins, et al. (2010) reported that one group received explicit phonemic awareness training with the SLPs and multisensory reading instruction from a special educator in conjunction with classroom instruction. The remaining group received classroom reading instruction exclusively (Kerins, et al., 2010). Kerins et al. (2010) found no significant differences when comparing the results of a classroom-based intervention to students receiving classroom intervention plus 16 hours of additional intensive instruction. Both groups demonstrated overall improvements in reading efficiency, including segmenting and blends (Kerins, et al., 2010). RTI provides an opportunity for SLPs to address academic achievement through their work with language literacy, curriculum, and learning in school (Sanger, et al., 2012).

### **Conclusion**

There have been many positive outcomes resulting from using the RTI initiative with literacy compared to using only general classroom instruction (Rock, 2018). The collaborative role opens the doors for a more intensive, ongoing involvement with the education of the students (Vicker, 2013). Working as a team allows a focus on improving communication support for students in instruction while targeting and focusing on specific student challenges (Vicker, 2013). Collaboration is a two-way process that requires teachers, administrators, interventionists, and SLPs to discuss specific learners, learning objectives, and how these can be achieved as well as share knowledge and expertise in the planning and assessment of learners (Wium & Louw, 2013).

Even with all of the success using RTI, there are still many obstacles to implementing the program; one is a lack of administrative support (Jones, Yssel, & Grant, 2012). Ongoing administrative support is key to executing a successful RTI program. It is not feasible to expect teachers to engage in the RTI process without their support and guidance (Petronne, 2014). This support also must include providing teachers with meaningful professional development and appropriate resources for each intervention tier and enabling collaboration between teachers-peers (Petronne, 2014).

Administrators, school staff, and SLPs are positioned to work together as collaborators and advocates with and on behalf of the students receiving RTI services. It is evident that all

team members must collaborate to leverage each other's strengths and contribute to supporting students (Tuttle et al., 2021). Collaboration efforts are ideal initial steps in building partnerships to support RTI in schools (Tuttle et al., 2021).

### References

- American Speech-Language-Hearing Association (2010). *Roles and responsibilities of speech-language pathologists in schools*. [www.asha.org/policy](http://www.asha.org/policy)
- Boyle, C., Scriven, B., Durning, S., & Downes, C. (2011). Facilitating the learning of all students: The 'professional positive' of inclusive practice in Australian primary schools. *Support for Learning* 26(2), 72-78. <https://doi.org/10.1111/j.1467-9604.2011.01480.x>
- Brandel, J.M., & Loeb, D.F. (2011). Program intensity and service deliver models in the schools: SLP survey results. *Language, Speech, and Hearing Services in Schools*, 42, 461-490. [https://doi.org/10.1044/0161-1461\(2011/10-0019](https://doi.org/10.1044/0161-1461(2011/10-0019)
- Catts, H. W., Nielsen, D. C., Bridges, M. S., Liu, Y. S., & Bontempo, D. E. (2015). Early identification of reading disabilities within an RTI framework. *Journal of Learning Disabilities*, 48(3), 281-297. <https://doi.org/10.1177/0022219413498115>
- Collier, C. (2010). *RTI for diverse learners: More than 200 instructional interventions*. Thousand Oaks, CA: Corwin.
- Denton, C. A., Tolar, T. D., Fletcher, J. M., Barth, A. E., Vaughn, S., & Francis, D. J. (2013). Effects of tier 3 intervention for students with persistent reading difficulties and characteristics of inadequate responders. *Journal of Educational Psychology*, 105(3), 633-648. <https://doi.org/10.1037/a0032581>
- Ehren, B.J., Blosser, J., Roth, F.P., Paul, D.R., & Nelson, N.W. (2012). Core commitment. *ASHA Leader*, 17(4), 10-13.
- Foster, W. A. & Miller, M. (2007). Development of the literacy achievement gap: A longitudinal study of kindergarten through third grade. *Language, Speech, and Hearing Services in Schools*, 38(3), 173.
- Friend, M., & Cook, L. (1992). *Interactions: Collaboration skills for school professionals*. Longman Publishing Group.
- Glover, A., McCormack, J., & Smith-Tamaray, M. (2015). Collaboration between teachers and speech and language therapists: Services for primary school children with speech, language and communication needs. *Child Language Teaching and Therapy*, 31(3), 363-382.
- Gosse, C.S., Hoffman, L.M., & Invernizzi, M.A. (2012). Overlap in speech-language and reading services for kindergartners and first graders. *Language, Speech and Hearing Services in Schools*, 43(1), 66-80. [https://doi.org/10.1044/0161-1461\(2011/09-0080](https://doi.org/10.1044/0161-1461(2011/09-0080)
- Graves, A. W., Brandon, R., Duesbery, L., McIntosh, A., & Pyle, N. B. (2011). The effects of tier 2 literacy instruction in sixth grade: Toward the development of a response-to-intervention model in middle school. *Learning Disability Quarterly*, 34(1), 73-86. <https://libcatalog.atu.edu:443/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=a2h&AN=65550618&site=ehost-live&scope=site>
- Greenfield, R.A., Rinaldi, C., Proctor, C. P., & Cardarelli, A. (2010). Teachers'

- perceptions of a response to intervention (RTI) reform effort in an urban elementary school: A consensual qualitative analysis. *Journal of Disability Policy Studies*, 21(1), 47-63. doi: <http://libcatalog.atu.edu:2097/10.1177/1044207310365499>
- Hazelkorn, M., Bucholz, J. L., Goodman, J. I., Duffy, M. L., & Brady, M. P. (2011). Response to intervention: General or special education? Who is responsible? *The Educational Forum*, 75(1), 17-25.  
<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/850510591?accountid=8364>
- Jones, R.E., Yssel, N., & Grant, C. (2012). Reading instruction in tier 1: Bridging the gaps by nesting evidence-based interventions within differentiated instruction. *Psychology in the Schools*, 49 (3), 201-218.
- King, S. A., Lemons, C. J., & Hill, D. R. (2012). Response to intervention in secondary schools: Considerations for administrators. National Association of Secondary School Principals. *NASSP Bulletin*, 96(1), 5-22.  
<https://libcatalog.atu.edu:443/login?url=https://libcatalog.atu.edu:2409/docview/1009166105?accountid=8364>
- Peck A.F. & Scarpati, S. (2007). Special Issue: Responsiveness to intervention: *Teaching Exceptional Children* 39(5), 4.
- Petrone, K. (2014). *Improving outcomes for students with or at risk for reading disabilities*. New York, NY: Nova Science.
- Reed, D. (2013). SLPs & common core state standards: Fitting it all together. *Elementary School Journal*, 110(3), 301-322. <http://sublimespeech.com/2013/02/slps-common-core-state-standards.html>
- Rock, A. Response to Intervention: Reading and reading disabilities. *BU Journal of Graduate Studies in Education*, 10(1), 25-29 (2018).
- Rosenfield, S., Newell, M. Zwolski, S. & Benishek, L. W. (2018). Evaluating problem solving teams in K-12 schools: Do they work? *American Psychologist*, 73(4), 407-419.  
<https://doi.org/10.1037/amp0000254>
- Sanger, D.D. , Snow, P.C., Colburn, C., Gergen, M., & Ruf, M. (2012). Speech-language pathologists' reactions to response to intervention: A qualitative study. *International Journal of Speech-Language Pathology*, 14(1), 1-10.  
doi:10.3109/17549507.2011.604793
- Spracher, M.A. (2000). Learning about literacy: SLPs play key role in reading, writing. *The ASHA Leader*, 5, 1 – 19. <http://leader.pubs.asha.org/article.aspx?articleid=2292588>
- Tuttle, M., Harrison, J., Johnson, L.V. Mecedon-Mann, M. (2021). What's in a word?: School counselor and ESOL teacher perceptions and attitudes about collaboration. *Journal of School Counseling*. 19(22).
- Vaughn, S. & Fletcher, J.M. (2012). Response to intervention with secondary school students with reading difficulties. *Journal of Learning Disabilities*, 45(3), 244-256.
- Vaughn S., Wanzek J., Wexler J., Barth A., Cirino P.T., Fletcher J.M., & Francis D.J. (2010) The relative effects of group size on reading progress of older students with reading difficulties. *Reading and Writing*. 23(8):931–956. <https://doi.org/10.1007/s11145-009-9183-9>.
- Vicker, B. (2013). The 21<sup>st</sup> century speech language pathologist and integrated services in classrooms. *The Reporter*, 14(2), 1-5, 17.
- Wanzek, J., Vaughn, S., Scammacca, N.K., Metz, K., Murray, C.S., Roberts, G., & Danielson,

- L. (2013). Extensive reading interventions for students with reading difficulties after grade 3. *Review of Educational Research*, 83(2), 163-195.
- Wilson, L., McNeill, B.C., & Gillon, G.T. (2016). A comparison of inter-professional education programs in preparing prospective teachers and speech and language pathologists for collaborative language-literacy instruction. *Reading and Writing*, 29, 1179-1201. <https://doi.org/10.1007/s11145-016-9631-2>
- Wium, A.M. & Louw, B. (2013). Revisiting the roles and responsibilities of speech-language therapists in South African schools. *The South African Journal of Communication Disorders*, 60(1), 31-37. <https://doi.org/http://libcatalog.atu.edu:2097/10.4102/sajcd.v60i1.8>