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Project Title: Integrating Augmented Reality Lessons in Mathematics

The purpose of *Integrating Augmented Reality Lessons in Mathematics Research* was to support Mrs. Lopez, a fifth grade teacher, in her efforts to engage and teach mathematics to 5th grade students. Most school sites have immediate access to iPad and high-speed internet. However, these resources and underutilized and neglected, the application of augmented reality apps allows teachers to use the resources they have access to and support student learning and engagement.

The Final Report

1) Impact on Research and Instruction

During the fall 2025 semester, I had the opportunity to collaborate with Mrs. Lopez at her school site and engage with her fifth-grade students. Having not taught elementary school since 2000, this experience provided an eye-opening perspective on the many changes that have occurred in education over the past 25 years. Strategically aligned with my return to a faculty professor role, this experience proved invaluable as I prepare to teach future elementary educators. Interacting with elementary-aged students allowed me to reacquaint myself with their academic abilities, maturity levels, and capacity to remain on task. This hands-on experience has significantly informed and enhanced my instructional practices.

Nothing could replace the value of directly engaging with students and teachers to gain a deeper understanding of the challenges and complexities they face in the classroom. Initially, I assumed that technology might present issues or concerns; however, I found that both the technology and internet access functioned as intended and did not hinder instruction or students' ability to utilize the augmented reality resources. The primary adjustment needed was to the lesson timeline, as students required additional time to remain on task and achieve the intended learning objectives. As a result, supplementary lessons were incorporated to ensure that students could fully meet the outcomes.

The integration of technology into the lessons proved both effective and engaging. The learning objectives and teaching strategies were enhanced by the use of

technology, which captured students' interest and supported their understanding of new math concepts. For many students, this was their first experience with augmented reality resources, which further increased their engagement and curiosity. The introduction of this new technology, paired with an innovative approach to teaching math concepts, was well-received and demonstrated the potential for technology to enrich the learning experience.

This experience not only deepened my understanding of the current elementary classroom environment but also provided practical insights that I can now apply to my teaching practices for future educators.

2) Impact on College of Education Teaching

My teaching has been positively influenced by my recent classroom experiences. Spending time in an elementary classroom allowed me to reconnect with the current demands of elementary teaching and better understand the needs of future educators. Compared to previous years, teachers today face significantly more requirements, with a strong emphasis on safety procedures and the well-being of students. This heightened focus on safety will directly inform my instruction and the preparation of future teachers.

One notable change I observed was the increased number of students in the classroom. Having spent much of my elementary teaching career in classrooms with a 20-to-1 student-teacher ratio, adapting to a classroom with 27 students was a new experience. The larger class size required additional time on task, greater attention to individual needs, and more frequent comprehension checks to ensure all students understood the material. This level of intentionality places considerable demands on elementary teachers, and requires effective lesson planning, classroom organization, and strong time management skills.

These observations and experiences will shape my teaching as I return to the Department of Elementary and Bilingual Education. I am committed to helping future elementary teachers develop the skills and strategies they need to succeed in today’s increasingly complex classroom environments.

3) Renewed Engagement in the field

My work in the elementary classroom has reignited my passion for the field, as it allowed me to actively engage with the elementary school community. Having last taught at the elementary level 25 years ago, this experience provided me with the opportunity to spend several hours each week with teachers and immersed in the culture of an elementary campus. This hands-on involvement has deepened my connection to the profession and renewed my commitment to teaching.

During this time, I utilized augmented reality tools and aligned lesson plans with math education standards to enhance student engagement and instructional

effectiveness. Reflecting on math instruction through this lens allowed me to design purposeful, engaging lessons that supported student learning. Additionally, this experience strengthened my understanding of the broader needs within the education community.

None of this would have been possible without the time spent in the elementary classroom, where I gained valuable insights into the needs of both students and the classroom teacher, Mrs. Lopez. This experience has been instrumental in shaping my perspective and reinforcing my dedication to the field of education.

4) Goals Achieved

My research outcomes included gathering data to inform the writing of my book for elementary teachers on using technology as a method for teaching mathematical concepts to young learners. This goal was successfully achieved, and I was also able to develop practical advice for teachers interested in incorporating augmented reality resources into their instructional practices. This advice includes implementing safety procedures when using internet-based resources, ensuring proper care of technology tools, and managing students as they explore new technologies and engage with augmented reality to support mathematical concepts. Specifically, this project focused on teaching geometry concepts and measurement through the use of targeted applications.

A secondary goal was to design more interactive lessons that incorporate augmented reality and integrate a Justice, Equity, Inclusion, and Engagement (JEIE) lens, which I plan to include in my book for K-12 teachers. I successfully created these interactive lessons by drawing on my classroom experiences. Applying JEIE strategies to my teaching felt natural and aligned with my broader goal of classroom engagement and renewing my passion for the field.

I created five new lessons that included:

- An introduction to using augmented reality and iPad in the elementary classroom
- Technology safety and guidelines to promote learning
- Setting priorities in a technology driven lesson plan
- Geometry standards and the elementary classroom
- The Measuring App and making sense of space and distance

My third goal was to align my research with the COE's goals of fostering a learning environment that promotes a just education, an equitable education and an inclusive education for all. I focused on the culturally relevant perspectives and included this as part of the resources in my book to support teachers in their application of technology resources.