

Leveraging the SAMR Model to Improve Technology Adoption Among Pre-Service Teachers

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INTRODUCTION

This research explores the practicality of integrating technology in early childhood teacher education using case studies designed to uncover pre-service teachers’ (PSTS) viewpoints. Despite the widely known benefits of technology in education, many pre-service teachers (PSTS) are reluctant to completely integrate it (Backfisch et al., 2021). More than ever, technology has become integrated in daily life in this rapid age of technological advancement. This is particularly apparent in young children, who are exposed to a variety of digital tools and equipment at a young age (Ren, 2023). For example, research has explored how using technology in the classroom can have negative impacts on children’s learning (Gottschalk, 2019). This brings up important concerns for PSTs who are considering how to implement technology into their future classrooms.

Case studies have been used in social sciences to explore underlying beliefs and perspectives presented in real-world examples (Heale & Twycross, 2017). Case studies can potentially illustrate practical applications of technology integration in many contexts, including subjects like screen time regulations or virtual reality. This study examines PSTs’ reflections from case studies during a technology-focused course by evaluating student responses using the SAMR paradigm (Substitution, Augmentation, Modification, Redefinition), providing insights into their evolving technological ideologies (Puentendura, 2006).

RESEARCH QUESTIONS

- 1) How do PSTS describe using technology?
- 2) How do PSTs’ descriptions reflect levels of the SAMR model?

LITERATURE REVIEW

- The SAMR paradigm can be used to incorporate technology more effectively into pre-service teacher education (Boonmoh & Kulavichian, 2023). When PSTs are introduced to the SAMR paradigm, they can actively reflect on and improve their methods of integrating technology (Tuniera et al., 2020).
- Nayari and Chigona (2021) also examined the use of TPACK and SAMR by teacher educators in pre-service teacher training programs. Teacher educators frequently include technology in traditional teaching approaches, i.e. Bloom’s Taxonomy, the SAMR model evaluates technology integration in teaching. Moving through SAMR levels improves teaching (Alivi,2019).
- PSTs must understand technologies to integrate them effectively and meaningfully into classroom activities (Can et al., 2017).
- PSTs should be equipped with technology in their classrooms to prepare teachers. They must also have continuous education or professional development to support their understanding of technology integration (Jimarakon et al., 2021).
- PSTs who participated in teacher training programs have acquired the pedagogical competencies and skills needed for their future careers (Jimarakon et al., 2021).
- While digital technology is seen positively in many early childhood education spaces, its practical use is limited, with television and computers being the primary devices utilized (Konca & Erden, 2021).

METHODS AND CASES

Data for this study were gathered from nine preservice teachers (PSTs) enrolled in the Learning with Educational Technology course. Students completed 4 case studies covering various topics. The case studies were analyzed using a constructivist research paradigm, using the SAMR as starter codes. We also used open coding to capture positive and negative comments about technology. First, we read each student’s work and coded it. Then, we looked across cases to explore whether there were consistent trends across individual students.



Is technology developmentally appropriate?

Imagine you are a teacher serving on your school’s technology committee considering a 1:1 device initiative for students.

What are your recommendations for what teachers should consider regarding how much technology to use in the classroom?



Is virtual reality appropriate for young children?

Imagine your school has just been given an \$18,000 grant. Write a proposal for how you would spend the money.

You must decide between one of three options: 1) VR headsets, 2) other technology 3) dramatic play materials.



New Mexico: Education, Access & the Law

In 2018 Yazzie Martinez was a plaintiff suing the state of New Mexico for not providing adequate education to students. In 2021, she sued again to say that things had gotten worse since the pandemic.

Write a letter to the local paper that contains your opinion as a local teacher.



Should ChatGPT be used in the classroom?

The teachers at your school are in a vigorous discussion about whether/how to use GPT with students. You are asked to weigh in. Should it be used? Is it considered cheating? What must the school consider before implementing Chat GPT?

Examples of Negative Comments

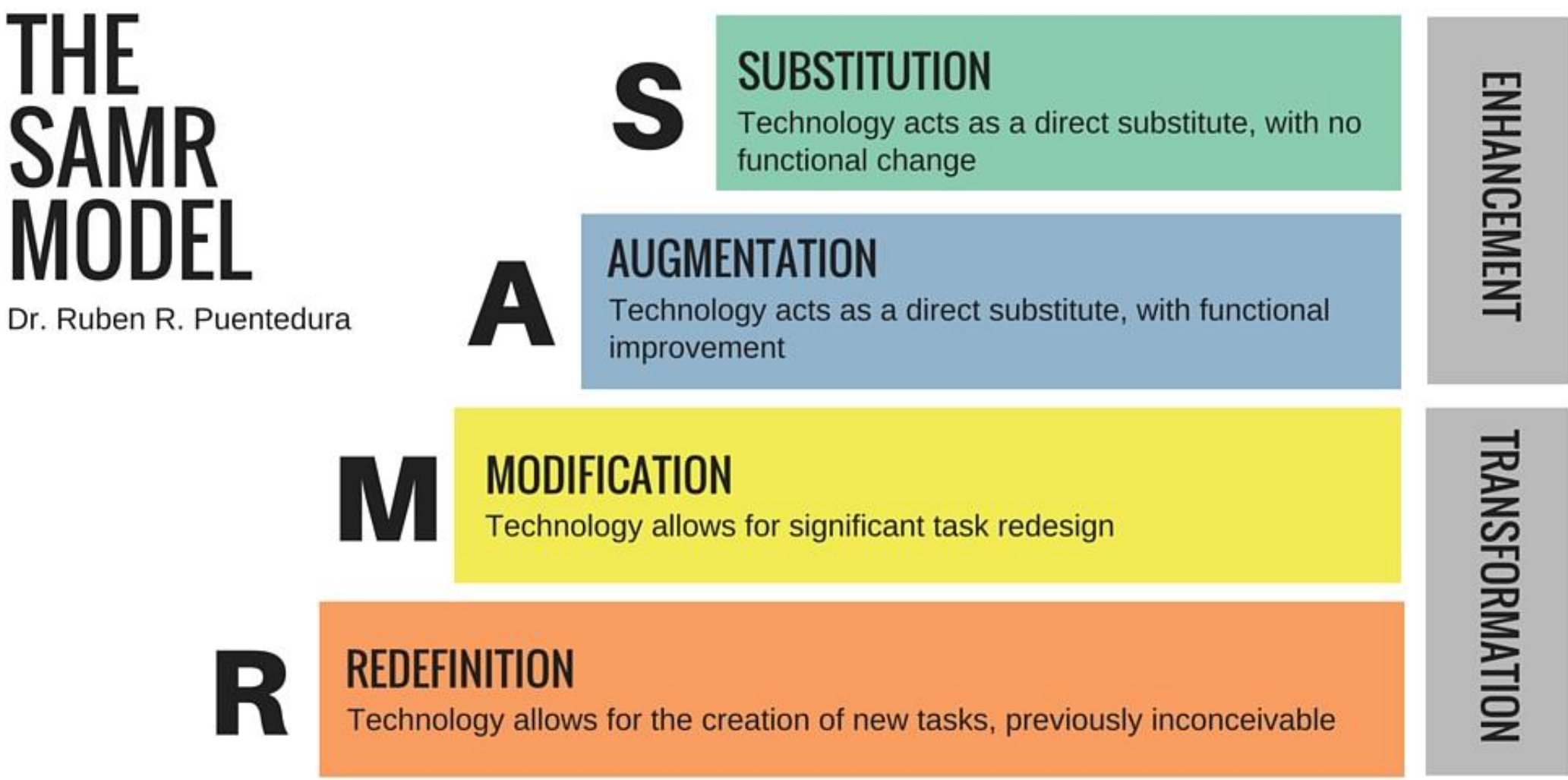
- Children learn better when there is physical interaction.
- VR/AR are just too expensive. If I have the budget to buy it. It doesn’t mean I have the budget to maintain it.
- Each time they use Chat GTP instead of their own words, they lose the opportunity to become better students.

Examples of Positive Comments

- By embracing technology, we can create a dynamic and interactive learning environment that stimulates curiosity and nurtures lifelong learning .
- Properly implementing AI may enable students to successfully navigate the digital world.
- Technology integration in classrooms not only enhances student motivation but also encourages active participation.

RESULTS & DISCUSSION

Many PSTs spoke positively about using technology, especially towards the end of the semester. The successful integration of technology into the teaching practices of pre-service teachers depends greatly on their proficiency with these tools (Can et al., 2017). Although PSTS may see the usefulness of technology, they fall short in using more advanced technology integration (modification or redefinition). As one PST stated “teachers must use technology to help prepare [students] for the **inevitable** use of technology.” Teacher educators must continue to work to help PSTs see how technology use can be transformational.



SAMR Level

Examples

Hardware	• It could mean a wide variety of devices such as computers, headphones, keyboards, iPads [VR grant] • Interactive and hands-on devices, such as tablets with educational learning apps, can enhance learning experiences [screen time] • Chromebooks can be easily shared between as many students as needed [VR grant] • It means giving students the tools they need to thrive in an increasingly digital environment [New Mexico]
Substitution	• Infants and toddlers can only use video chat with their parents and grandparents [screen time] • Students need the internet and computers to complete their homework, quizzes and assignment [New Mexico] • You could use [chat GPT] with your students by taking turns asking questions [ChatGPT]
Augmentation	• The VR/AR classroom is designed...to engage or enhance what [teachers] are currently learning [VR grant] • Educators can leverage digital tools to create engaging lesson plans, collaborate with peers and provide timely feedback [New Mexico]
Modification and/or redefinition	• ChatGPT can translate assignments into a student's native language, rewrite responses at different reading levels. It can be used to create quizzes for reading checks in classrooms, allowing students to read and their own pace [Chat GPT] • Students can use it to brainstorm ideas for a specific topic and get feedback on their writing [ChatGPT].

REFERENCES

