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Teacher Educators' Appropriation of TPACK-SAMR Models for 21st Century Pre-Service Teacher Preparation

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ABSTRACT

The study examined how teacher educators are appropriating technological, pedagogical, and content knowledge (TPACK) and substitution, augmentation, modification, redefinition (SAMR) frameworks in their pre-service teacher preparation programmes. To ensure rigor, quality, and preparedness of pre-service teachers, there is a need to articulate expectations around effective use of these frameworks together with contemporary teaching and learning theories at the pre-service teacher preparation level. One-on-one in-depth interviews and participant observations were conducted with eight (8) teacher educators. The findings revealed that teacher educators are appropriating technology in ways harmonious with their prevalent traditional teacher-centred teaching strategies at enhancement levels. The researchers recommend the adoption of technology integration frameworks and teaching and learning theory at policy making levels in pre-service teacher training institutions.

KEYWORDS

21st Century Education, 4Cs, Constructivist, Pre-Service Teachers, SAMR, Teacher Educators, Teacher Preparation Programmes, Teaching with Technology, Technology Integration, TPACK

INTRODUCTION

The 21st century is characterised by an influx of information from various sources. Technological advancements have made it increasingly easy to share and access this information almost instantly. This presents the education field with both a challenge and opportunity in the teaching practice. The challenge being not all the available information is useful or even meaningful, therefore the 21st century requires that students acquire the 4Cs (communication, collaboration, critical thinking and creativity) on how to engage with the information and not just receive it. The mandate on educational institution is therefore to make use of technology-enhanced practices to facilitate acquisition of these skills.

The use of technology in education is largely accepted to be an integral and expected part of the teaching and learning experience in this digital age. Teachers' knowledge of technology, and how it is incorporated into the curriculum, is currently a major focus of research in teacher education. Motivated by the belief that technology has the potential to improve learning processes, the South

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African Education Department and donor agencies are currently investing in projects aimed at providing technology into schools. However, the potential of technology can only be realised in schools when it has been properly adopted and integrated in the teacher preparation programmes. Technology integration in teacher preparation is not fully understood as most studies give attention to the practice of pre-service teachers (PSTs) use of technology for education. There appears to be fewer studies that focus on teacher educators [1](TEs) practices especially in teacher preparation programmes and their ability to model effective teaching with technology. In this study, effective teaching is whereby a TE uses technology to motivate and engage students in their learning as they develop knowledge and relationships with their learners. This study, therefore, sought to explore TEs' teaching strategies in teaching with technology so as to understand their current practices, and further evaluate existing technology models TEs are using to effectively prepare PSTs to teach with technology in the 21st century.

BACKGROUND

Preparing PSTs to appropriate technology use for teaching and learning is of paramount importance in this digital era. Many TEs are assertive of their use of technology in their personal lives, but they are hesitant in translating it into their professional practices. However, researchers have also indicated that PSTs are not adequately equipped with sufficient knowledge to integrate technology in teaching and learning (Chigona & Chigona, 2013; Sang, Tondeur, Chai, & Dong, 2014; Tondeur, Pareja Roblin, van Braak, Voogt, & Prestridge, 2017; Voogt & McKenney, 2017). Teaching with technology goes beyond mere acceptance of digital tools but should be purposefully applied in their daily practices to achieve teaching and learning goals (Tondeur et al., 2017). Even though many studies have proven technology is being effectively utilised in other sections of society, this does not always imply that the same effects are also realised in educational settings. Studies have revealed that pre-service teachers[2] feel inadequately prepared to integrate technology in their future classrooms (Enochsson & Rizza, 2009; Tondeur et al., 2012). While this may be due to several factors, it is believed that the quality of pre-service teachers' preparation in the use of technology for learning, strongly shapes how they view and use technology in their future practice. Tondeur et al. (2013, p. 242) suggested that: "technology should be infused into the entire PSTs curriculum so that they; (a) understand the educational reasons for using technology and (b) experience how technology can support teaching and learning across a variety of subject disciplines."

TPACK is viewed as the widely accepted model to account for teacher knowledge on how to effectively teach with technology. Researchers, however, reveal that PSTs are only being equipped with technology skills in isolation to the teaching methods and subject matter (Tondeur et al., 2017; Voogt & Mckenney, 2017). Although the TPACK constructs may not have a universally accepted meaning, there seems to be some degree of agreement that there is need for educators to appropriate TPACK in their PSTs preparation program. Harris, Mishra, & Koehler, (2009, p. 393) argue that many current technology integration strategies are techno centric, often omitting sufficient consideration of the dynamic and complex relationships among content, pedagogy, and technology. TPACK is envisaged as a useful conceptual framework to explain the kind of knowledge teachers need to appropriate digital technology (Mishra & Koehler, 2006). TPACK encompasses the link between technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) (Mishra & Koehler, 2006), that contribute to TE's knowledge needed to effectively integrate technology in teaching and learning. This research study acknowledges the seven constructs of TPACK i.e. TCK (Technological and Content knowledge), TPK (Technological and Pedagogical knowledge), TK (Technology Knowledge), CK (Content Knowledge), PK (Pedagogical Knowledge) and TPACK (Technological, Pedagogical, and Content Knowledge), however this study focuses on the constructs with technology as an element. Preparing PSTs to effectively teach with technology implies that TEs need to understand how to shape instructional practices in which technological, content and pedagogical knowledge are embedded.