Book Review

Handbook of Research on Digital Content, Mobile Learning, and Technology Integration Models in Teacher Education

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As the title implies, *Handbook of Research on Digital Content, Mobile Learning, and Technology Integration Models in Teacher Education*, focuses on integrating digital content and active learning pedagogies using mobile/digital devices in the modern technology-rich classroom. With the integration of information and communications technology (ICT) with education, many novice teachers utilize technology in their pedagogical practices, but there are still some teachers who reject the use of technology in the classroom. Due to a lack of knowledge regarding the integration of technology and pedagogy, some novice teachers do not know how to develop students' high-level capabilities, such as critical thinking, creativity and teamwork, and this represents a major challenge in pre-service teacher training (Brinkley-Etzkorn, 2018; Tseng, Cheng, & Yeh, 2019). The Technological Pedagogical Content Knowledge (TPACK) model, which is an influential technology integration model in the field of teacher education, contains three main knowledge domains, namely, technological knowledge (TK), pedagogical knowledge (PK), and content knowledge (CK) (Mishra & Koehler, 2006; Xie, Di Tosto, Chen, & Vongkulluksn, 2018). Targeting novice teachers in pre-service training, faculty in teacher education, and teachers who want to improve their teaching methods, this book provides a collection of TK, PK, CK, and technology integration knowledge, references to which are scattered throughout the chapters. For easier understanding, we have organized this book review according to the relevance of the topics in each chapter rather than chapter by chapter. Based on the TPACK framework, the review follows the sequence of instructional framework, TK and Technological Content Knowledge (TCK), Technological Pedagogical Knowledge (TPK), and the benefits of technology integration.

The first section of this review covers five chapters involving the instructional framework/ model and policies in teacher education, that is, Chapters 1, 7, 14, 17, and 18. Chapter 1 suggests using the TPACK framework and applying the principles of Universal Design for Learning, which means providing multiple, varied, and flexible options for representation, action and expression, and engagement for all learners. Chapter 7 presents a model for teachers and instructors to employ in making an appropriate choice regarding an instructional design model. Here, learner attention, learner feedback, and context awareness are identified as three critical factors in choosing an effective model

in teacher education. Chapter 14 proposes a theoretical framework and learning methodology for change-based learning and innovative mobile learning. In the proposed framework, students are both prosumers and consumers, and mobile learning can be integrated with heutagogy, innovative new technologies, collaborative learning, authentic, and challenge-based learning, personal learning, and ubiquitous learning. Based on the Rasch analysis, Chapter 17 proposes a design for a measurement framework to assess and evaluate students' readiness and growth in terms of technical knowledge. A method for developing a scale similar to the Rasch scale for use in the classroom is described in detail. Based on Ball's policy framework, Chapter 18 examines the impact that Malawi's education technology policy for integrating ICT into secondary teacher education has had since 1994. It is argued that national policies are an important tool for the realization of ICT's integration in education, but that inconsistencies, ambiguities, and gaps in policy documents present a challenge for actors in policy implementation. In summary, these chapters provide readers with a comprehensive understanding of the instructional framework, model, and policy documents.

The second section of this review covers six chapters focusing on TK and TCK, that is, Chapters 3, 5, 6, 8, 10, and 19. Chapter 3 presents a case study in which researchers design, develop, implement, and evaluate an online orientation module for new students at a Canadian postsecondary institution, aligned to the principles of analyze, design, develop, implement, and evaluate and The Universal Design For Instruction framework. Collaborative learning and strong instructor presence are emphasized as significant factors in effective online orientation programs. Chapter 5 adopts Wilber's (2006) Integral Methodological Pluralism as a framework to investigate teachers' attitudes toward the integration of technology from a four-quadrant perspective. The results indicate that as long as policy makers view the role of technology as a form of learning in itself rather than a tool, school leaders, IT departments, and teachers can work together to promote the integration of technology effectively. Chapter 6 discusses the positive effects of the flipped classroom and reflective e-portfolio in professional development in a postgraduate program in Namibia. Similarly, Chapter 8 demonstrates the effectiveness of a web-based management system and audio/video media devices in advancing the education of counselors-in-training (CITs). Other enhanced technological tools, such as wikis, Webex, podcasts, websites, chat tools, and clickers, are helpful in training counselor educators to better train CITs. Chapter 10 examines the application of artificial intelligence-based solutions, such as a tutoring platform based on the Expert Control System (ECS), and an agent-based tutoring system in assessment for learning. The point is made that artificial intelligence-based learning assessment tools not only innovatively implement formative assessments and avoid subjective biases on the part of teachers, peers, and students, but also motivate and maintain life-long competency-based learning for all stakeholders. Chapter 19 describes the adoption of innovative mobile technologies in professional development in Nigerian academic libraries. The websites and librarians of 15 academic libraries are investigated, and the findings indicate that there is a gap between the mobile application and the services provided by these library apps, which cannot meet the user's expectations.

The third section of this review mainly addresses the chapters in this book related to student-centered pedagogy which can be grouped under TPK, namely Chapters 2, 4, 16, and 20. Chapter 2 presents a Master's program that uses the active learning principles of choice, ownership, and voice through authentic learning (known as COVA) and Creating a Significant Learning Environment (CSLE) to engage and equip learners to be digital leaders. The results imply that modeling the COVA approach, and CSLE can help instructors to utilize the approach by giving them enough time to learn how the approach works when applying methods in their own context. Chapter 4 demonstrates that a shift on the part of teachers toward a more student-centered pedagogy in today's classroom could positively influence student engagement and academic success. Moreover, it is emphasized that in order to better realize the integration of technology and the transition from teacher-centered instruction to learning-centered learning, online and offline administrators need to implement appropriate teacher

support and professional training. Chapter 16 explores the benefits, limitations, and opportunities of online instruction in higher education. The argument is that although online courses have become common in universities, the success of online teaching and learning depends on ongoing faculty development, well-designed, challenging courses, and timely feedback from instructors. Chapter 20 examines the integration of mobile technology and the adoption of pedagogy in the classrooms at Historically Black Colleges and Universities. If mobile learning is used appropriately in the classroom, it can promote both students' motivation and their learning engagement. Therefore, in order to provide competitive education, a university administration needs to invest funds continuously in providing faculty support and training, such as TPACK and technological integration.

The fourth section of the review discusses Chapters 9, 11, 12, 13, and 15, which deal with the benefits of integrating technology and relative variances, such as engagement and learning motivation. Chapter 9 examines the importance of the integration of technology in Science, Technology, Engineering and Mathematics (STEM) education in Kenyan secondary schools, and points out that it is expected that this will bridge the achievement gap between boys and girls in STEM education. Chapter 11 examines the effectiveness of Massive Open Online Courses in professional development, arguing that the integration of technology and digital content can benefit professional development and life-long learning by enhancing learner-driven, informal learning in virtual communities of practice. Originated from the public policy of the US encompassed in the Every Student Succeeds Act of 2015, Chapter 12 presents a comprehensive review of the integration of digital content, technology and student-centered pedagogy by examining the educational experiences of culturally and linguistically diverse students and students with disabilities. It is proposed that learner-centered psychological principles consist of four factors: the cognitive and metacognitive factor, the motivational and affective factor, the developmental and social factor, and the individual differences factor. It is recommended that further study be carried out on the match or mismatch of technology use with these learning principles or with learners' diverse needs. Chapter 13 elaborates on the importance of educational leadership in teaching and learning in higher education. The chapter reports research findings indicating that effective leadership has a positive impact on student learning and should be second only to the quality of the curriculum and the teachers. Best practices include setting your own pace and developing human capital, and a school should be an organizational unit which fosters personal and leadership responsibility. Chapter 15 offers a brief literature review on student engagement factors, and designates course assignment as a best practice to support student online engagement. Other technology tools to foster student online engagement are recommended and discussed, including blogs, forums, podcasting, Twitter, wikis, and YouTube.

In summary, this book encompasses a wide range of studies on digital content, active learning pedagogies, mobile learning technology, and technology integration models for teacher education. Regarding the integration framework/model and policy of educational technology and student-centered pedagogy, it is recommended that policy makers and teacher educators should apply and develop them, not only from the perspectives of local educational environment and cultural characteristics, but also from the perspective of global education. In addition, institutions should provide targeted support for teacher educators across disciplines, and should adopt coherent technology frameworks for their programs (Nelson, Voithofer, & Cheng, 2019). TPACK is a comprehensive framework, and technology should not be emphasized separately. Pedagogical expertise is a crucial prerequisite for TPK, and future studies are recommended to strengthen the research on the integration and influencing factors of TPK and TPACK, such as institutional support, and the values, beliefs and self-efficacy of novice teachers (Cheng & Xie, 2018; Lachner, Backfisch, & Stürmer, 2019; Nelson et al., 2019). For easier understanding, we organized this review based on chapter topics and the dimensions of the TPACK framework. If there is a second edition of this book, it is suggested that chapters be organized according to the relevance of the topics.

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