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Technology is rapidly changing the teaching and learning landscape. This implies that pedagogical shifts including the teacher’s roles, learner’s styles, and the process of learning are inevitable especially in classrooms where technology tools and applications are incorporated in authentic and innovative ways. Additionally, as technology becomes a critical part of the 21st century classroom, a teacher’s decision to integrate technology into the learning process is no longer a personal choice.

There is also a need for teachers to prepare active learners for a digital global economy that is characteristic of the 21st century. Key forms of active learning include discovery learning, problem-based learning, experiential learning, and inquiry-based instruction (Kirschner, Sweller, and Clark, 2006). Active learning is also primarily concerned with what students do with information as opposed to how much information the teacher and the learning environments can provide (Grabe & Grabe, 2008). Additionally, the ubiquitous presence of technology in schools implies the need for competent teachers who can teach effectively with these tools.

A majority of the current students are technology-savvy, consider traditional methods of teaching boring, and have short attention spans (Horne, 2010). Teachers can build on their prior knowledge bases and engage these learners through technology to be successful in the classroom. Thus, technology changes the roles of teacher and students: The traditional role of teacher as dispenser or information is challenged, and the teacher’s new role is that of a guide: to challenge students’ thinking and encourage reflection in the learning process. Also, just having technology tools in the classroom by itself does not translate to active and engaged student learning. However, innovative pedagogical approaches with technology leaves students with a more effective learning environment that promotes quality teaching and active student learning (Grabe & Grabe, 2008).

Educational technology may challenge the entire approach to the classroom experience, the essence of teaching, and the purpose of a school, but as tools, it presents great opportunities to support engaged and active student learning (Keengwe, Onchwari, & Wachira, 2008). Additionally, technology provides great opportunities to enhance student learning if used appropriately and selectively (Keengwe, 2007; Keengwe & Onchwari, 2009; Kim & Hannafin, 2011). However, “it seems reasonable that teachers will be more likely to help their students learn with technology if the teachers can draw on their own experiences in learning with technology” (Grabe & Grabe, 2008, p. 4).

Given that the majority of teachers are still hesitant or not prepared to incorporate technology into education (Lei, 2009; Project Tomorrow, 2010) in ways that can enhance active student learning, it is logical to argue that the synchrony of pedagogy, technology, and change knowledge can transform classrooms by deeply engaging students in ubiquitous computing, authentic learning, and student-centered instruction, which in turn will enhance meaningful student learning beyond the classroom (Fullan, 2013).
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Similarly, preservice teacher programs need to provide teachers with effective strategies and techniques to help them enhance their experiences with the various instructional technologies. Such training has to take into consideration the need to promote preservice teachers’ self-efficacy beliefs and intrinsic goal orientation as this will make them value instructional technology and the role it will play in their future classrooms. This would also translate to more effective use of such technology with their future students (Chen, 2010).

Pedagogical practices should also guide faculty decisions about the appropriate and relevant forms of instructional technology tools best suited for specific learning objectives and outcomes in a specific learning environment. Thus, teachers should strive to create environments in which students actively engage in a cognitive partnership with content and technology. Technology-based learning environments enhance constructive interactions between learners and teachers to share meanings and develop new powerful meanings (Novak, 1998). Further, the ultimate goal of teaching is to guide learners to think critically, to learn how to solve-problems, and to create knowledge.

Effective classroom technology integration implies the need for professional development (PD) opportunities that are tailored to the individual teachers’ needs (Linton & Geddes, 2013). Given the vast differences in knowledge and experience with technology, differentiated PD allows participants the opportunity to learn at their own pace and understanding. Providing extended time to practice what was learned during a technology-based PD session would also help to improve teachers’ knowledge base (Linton & Geddes, 2013).

Consequently, education planners and policy makers must think beyond technology to keep teachers trained in various pedagogical uses of appropriate technology tools. There is also need for schools to determine the goals of technology in teaching and learning, and the types of technology tools that will support efforts to meet those goals. School leaders, for instance, should assure teachers that the goal of technology tools is to improve teaching and learning, and not to replace them.

The critical role of technology in education and the noble obligation for teachers to prepare active learners for a digital global workplace imply the urgent need for educators to review appropriate and effective ways to integrate education technology into the teaching and learning process to support active and engaged student learning. Therefore, Handbook of Research on Educational Technology Integration and Active Learning offers best practices, challenges, and opportunities in the process of incorporating educational technologies into the teaching and learning process to enhance active student learning.

Chapter One examines a model for an active learning classroom and emerging technologies that support learning for the 21st century. Using vignettes, the authors model how the metacognitive teacher supports the use of emerging technologies for active learning using the Metacognitive Technological Pedagogical Content Knowledge Framework (M-TPACK).

Chapter Two introduces educational robotics as a transformational tool for learning, which promotes learning of computational thinking, coding, and engineering: critical ingredients of STEM learning in K-12 education. The purpose of this chapter is to highlight the importance of integrating educational robotics as a technological learning tool into K-12 curriculum to promote Rich Environments for Active Learning (REALs) to prepare students for the technology-driven future.

Chapter Three examines changes that have occurred recently in the distance education arena and the impact on higher education institutions focusing on undergraduate and graduate students taking these courses. Findings suggested: (1) increased enrollment in distance education courses, (2) courses allow for flexible schedules (3) better communication with instructor and (4) more meaningful learning overall for students.
Chapter Four discusses: 1) the need for technology literate teachers, 2) the role of teacher preparation programs, 3) the need for technology literate faculty, and 4) one training model for integrating technology into instruction, enhancing Missouri’s Instructional Network Teaching Strategies (e-MINTS). The purpose of this chapter is to create a sense of urgency for teacher preparation programs to model integrating technology into the instructional process.

Chapter Five provides a perspective on e-learning at Canadian Universities. This perspective includes a snapshot of the Canadian e-learning landscape as well as the results of a multi-university research study called the Meaningful E-Learning or MEL project.

Chapter Six weighs in on the technology-enhanced pedagogical designs discourse by proposing knowledge-centred models that integrate sound pedagogical strategy, ubiquitous technologies and situated learning to address student learning priorities and challenges in a Global Citizenship course at a South African university.

Chapter Seven extends a new definition and critical components of active learning in the context of technology integrated classrooms. Also, it offers active learning strategies aligned with technology tools that could be used effectively in K-12 classrooms to promote active learning.

Chapter Eight examines one strategy for enhancing teaching history of mathematics through digital storytelling. Additionally, the chapter provides components of digital storytelling and necessary steps to be taken into consideration while preparing digital stories.

Chapter Nine reports findings from an interdisciplinary literature review on pedagogical approaches and technological integration processes to facilitating active learning and deliberate practice toward expertise in professional education. The review covers selective domains that emphasize life-long learning, including teacher education, professional music education, athletic education, and medical education.

Chapter Ten presents findings of a study seeking to investigate if there is a relationship between active learning strategies (ALS) and skills and attributes that enhance learning (SAEL). The findings have implications for student success especially in the development of skills and attributes that enhance learning (SAEL) among college students.

Chapter Eleven examines the reliability and validity of the items used in the Student Ratings of Instruction [SRI] instrument. Three SRI factors were analyzed: efficacy, validity, and reliability. The additional application of Goodman & Kruskal’s Lambda, and Principal Component Factor Analysis with Varimax Rotation also found strong construct validity within the SRI. The findings have implications for improving SRI in course evaluation.

Chapter Twelve discusses an eLearning platform that is usable by persons with low vision. Specifically, this chapter supports the fact that eLearning is possible for persons with low vision, provided that all the necessary technological advances have been considered.

Chapter Thirteen examines how a teacher educator engages preservice teachers in the world of diversity using technology. The findings have implications for changing teaching and learning practice especially in the 21st century technology-rich classrooms.

Chapter Fourteen attempts to conceptually generalize the findings of a recent collective case study in order to develop a relevant theoretical framework for online formative assessment. The emerging theoretical framework is intended to inform successful implementation of formative assessment in online learning contexts.

Chapter Fifteen examines a review of literature on the opportunities and challenges in adopting e-learning programs in Tanzania as well as the possible measures to overcoming some of the identified challenges.
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Chapter Sixteen examines the opportunities and challenges in implementing Distance Learning (DL) and e-learning in Tanzania. It is suggested that effective DL implementation would require an appropriate budget and resource investment to support capacity building for teaching staff and students, and formulating policies, guidelines and operational framework on DL and e-learning.

Chapter Seventeen seeks to find out whether the investment in buying computers, for departments, lecturers’ offices, and equipping computer labs for the students while increasing bandwidth and connectivity and other infrastructure in Kenyan Universities is translating to actual faculty and student use in blended classrooms.

Chapter Eighteen examines opportunities for Social Networking Sites’ Complementation of Writing Centres. Findings suggest that students lacked confidence in asserting their authorial presence and familiarization with academic conventions. Further, students and consultants’ essays demonstrated a balanced appropriation of attitudinal and judgment categories and engagement resources, with implications for the potential of Facebook to mediate student expression of their voice.

Chapter Nineteen presents a research study on mathematics education pre-service teachers’ perceptions of competencies developed in an active learning course. The results of the study showed that, according to the mathematics education pre-service teachers, their Internet search skills, content knowledge about distance education, web interface design skills, and technological knowledge increased or improved due to the web-based instruction (WBI) project.

Chapter Twenty proposes deployment and adoption strategy of cloud computing to enhance blended learning services in sub-Saharan Africa. The chapter contributes towards helping higher education stakeholders in sub-Saharan Africa understand cloud services as well as plan for successful migration of computing services into cloud.

In summary, the critical role of educational technology in education imply the need for educators to review effective ways to integrate these tools into the teaching and learning process to support active and engaged student learning. However, technologies are not ends in themselves: a focus on just technology may not help, but good pedagogical practices that focus on teaching first and technology second will possibly lead to effective classroom technology integration that can support active and engaged student learning. Therefore, the hope is that each of the scholarly works presented will help forward the agenda and discourse on the significance as well as the need to review existing pedagogical practices to enhance effective teaching and learning with technology.

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REFERENCES


