

Preface

The exponential growth of learning technologies has caused major seismic shifts on the education landscape that have affected teaching and learning. Technology as the de facto vehicle driving all teaching and learning, when implemented effectively has a positive impact on teaching and learning, but a negative impact when not implemented appropriately. The constant shift from old to new technologies without supporting theoretical frameworks and supporting basic technology foundational skills, the “Paparazzi Theory,” is one such example of an inappropriate use of learning technologies affecting teaching and learning technologies.

Despite the disruptive trends with learning technologies and inappropriate integration, innovative strategies to engage learners have provided a pathway and stabilizing mechanism for educational institutions. Therefore, the *Handbook of Research on Innovative Digital Practices to Engage Learners* provides a global perspective on unique and innovative ways learning technologies aligned with key theories, overarching themes, and learning frameworks are used to engage diverse students in learning: gaming, collaboration, digital design, play as a learning strategies, creativity, self-efficacy, digital literacy, digital learning competencies, professional development, teacher education preparation, e-portfolio, technology-enhanced authentic learning, and e-learning.

Chapter 1, “Gaming to Learn: Bringing Escape Rooms to the Classroom,” explores the history of escape rooms, reviews research on the benefits of using escape rooms in classrooms as an instructional tool, and finally, discusses the results of the pilot test of a compost themed escape room game designed for use in middle school science classrooms.

Chapter 2, “Engaging Learners With Digital Literacy Practices,” explores how learners demonstrate their understandings of elements through their collaborative production of digital text. This chapter presents important pedagogical considerations that can guide educators in their support of learners at all ages as they examine digital literacy practices for both text consumption and production.

Chapter 3, “Breakout of a Traditional Classroom Reality With Game-Based Learning Pedagogy,” explores how Breakout EDU can be used in online and face-to-face higher education courses to engage students in learning and model a resource that pre-service teachers can use in their future teaching.

Chapter 4, “Constructing Meaning and Engaging Learners Through Digital Tools and Practices Within the Middle Level Science Classroom,” focuses on the intersection of three areas: how middle school students make sense of content and develop understanding; the utilization of strategies for designing and creating a middle school classroom around digital practices; and the challenges and opportunities that this instructional shift encounters.

Chapter 5, “Solving the Creativity Crisis: The Critical Need for Professional Development in Maker-Centered Teaching,” provides playful learning where young children can experience STEM and learn to think more creatively. With maker-centered teaching, we can *make* the next generation of innovators.

Chapter 6, “Room to *IMPROVE*: Designing Virtual Professional Learning Environments,” describes an innovative practice in providing graduate students with structured activities and resources to collaboratively author and digitally publish modules on *IMPROVE* (Instructional Modules for Professional learning Responding to Opportunities and Valuing Educators), a virtual professional active learning journal published on Digital Commons.

Chapter 7, “Examining the Links between Affect Toward 3D Printing Technology and Interest in STEM Careers Among Female Elementary Students,” reveals that perceived usefulness of 3D printing technology, self-concept in using 3D printing technology, and interest in and enjoyment of using 3D printing technology were significantly and positively related to interest in science-, math-, and technology-related careers among female elementary students.

Chapter 8, “Using SMART Table Technology for Interactive Elementary Classroom,” suggests that there are many benefits for educators to incorporate the SMART Table into daily instruction at elementary classrooms. Increased student engagement, increased peer collaboration, and strengthening comprehension are some of those key benefits. The study implications determined that the SMART Table can provide elementary students with an engaging outlet of instruction.

Chapter 9, “Saudi Arabia’s Female Middle School Mathematics Teachers’ Readiness and Attitudes Towards STEM Digital Technology Integration in Classrooms,” shows that participants demonstrated higher level pedagogical knowledge; knowledge was not fully applied in their classrooms, and participants had an average level of subject matter knowledge related to STEM disciplines indicating a deeper need for STEM disciplines knowledge and systematic support, such as training courses or professional development programs.

Chapter 10, “Lessons Learned: Teaching Latinx Teacher Candidates Through Digital Literacy and Community Service Learning,” focuses on digital literacy and community service-learning (CSL) strategies from the research of Latinx undergraduate teacher candidates (TCs); TCs engaged with technology in CSL courses.

Chapter 11, “Engaging Learners: A Digital Best Practice,” examines an innovative online peer engagement collaboration across geographic regions that peer deliberations on a collaborative website leads to academically reflective engagement among student peers and students and the content. The chapter further provides cross disciplinary educators reasons to and ways by which to incorporate peer engagement in their face-to-face, hybrid or online class along with a step-by step approach for educators across disciplines to implement as an innovative means to engage students in academic deliberation.

Chapter 12, “Multimedia Learning: Simulated vs. Real-World Digital Logic Circuit Curriculum,” explores digital experiences and real-world experiences at a midwestern university, with groupings named traditional hands-on lab.

Chapter 13, “Inclusive Education in Science Education: Are Science Teachers Using Inclusive Technologies in Science Classrooms?” suggests that the extent science teachers use technology for inclusion in science classrooms needs to be addressed at teacher education levels including providing professional development courses on inclusiveness at school district levels. State standards should also discuss how inclusiveness must be addressed in the general education classrooms.

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Chapter 14, “E-Portfolios and Learning Management Systems: A New Blend for Learning in Teacher Education,” provides insight to viewing teacher development for other teacher education courses and programs through more consistent and intentional use of e-portfolios.

Chapter 15, “Learning From Failure: Using Collaborative Technology to Make the Feedback Loop Work,” explores how to leverage the collaborative conversation through feedback loops that are critical to students mastering concepts in composition and information literacy.

Chapter 16, “*MusicWorks*: Supporting Students’ Musical Career Paths Through Technology-Enhanced Authentic Learning,” explores how enterprise pedagogy and entrepreneurial pedagogy can be authentic learning approaches for preparing and positioning music students within the higher education context.

Chapter 17, “Computational Participation as a Portal to Collaborative STEM,” explores computational participation as an integrative portal, offering a model for integration across individual disciplines, with an emphasis on the transformative potential of innovative digital practices to engage learners in collaborative Science, Technology, Engineering, and Mathematics (hereafter “STEM”) learning.

Chapter 18, “Role of IT Culture in Learners Acceptance of E-Learning,” explores factors that influence e-learning adoption and use among students in higher education in Kenya.

Chapter 19, “Teaching and Learning 21st Century Skills for Life,” examines the concept of 21st century skills and its acquisition through comprehensive re-structuring of our schools’ curriculum and modify the way we teach and examine our children.

Chapter 20, “Integrating Formal and Informal Learning Opportunities of Technology in Higher Education,” presents eight guideline for the integration of formal and informal learning opportunities of technology in higher education: (1) know your students, (2) update yourself, (3) be online, (4) provide sharing opportunities, (5) provide discussion opportunities, (6) keep information alive, (7) use learning analytics, and (8) support interdisciplinarity.

In summary, the *Handbook of Research on Innovative Digital Practices to Engage Learners* provides a backdrop for effective integration of learning technologies in educational settings. In general, the handbook examines key learning theories, concepts, and theoretical frameworks aligned with innovative strategies. This handbook is an excellent resource educators – it provides an understanding of how theories, digital content, and learning technologies are used to stimulate intellectual curiosity and learning. Finally, the handbook provides a blueprint for further research, reflections, and global perspective of integration and strategies to engage diverse learners.

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