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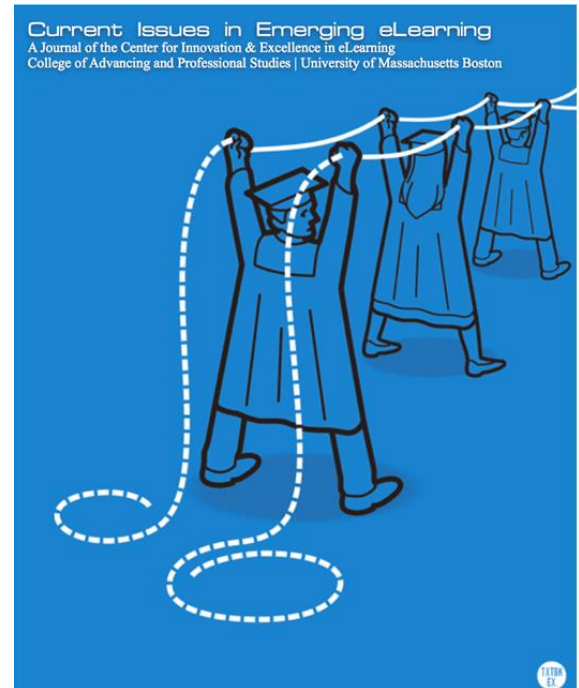
Special Issue on Leveraging Adaptive Courseware

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FOREWORD: LEVERAGING ADAPTIVE COURSEWARE AND ADAPTIVE LEARNING

Noreen Barajas-Murphy, Ed.D. – CIEE Guest Editor

This special edition of *Current Issues in Emerging eLearning* comprises new empirical research focused on strategies for implementing and scaling personalized and adaptive courseware solutions. A special call for studies related to adaptive courseware implementation was announced broadly.

The Personalized Learning Consortium (PLC) at the Association of Public and Land-grant Universities (APLU) was solicited for research originating from institutions who participated in a postsecondary success initiative funded by the Bill & Melinda Gates Foundation. This expansive initiative aspires to increase the success rate of disadvantaged undergraduate college students by using next generation digital courseware. In this context, next generation digital courseware is defined as those digital learning platforms developed to personalize instruction based on mastery learning principles and learning science. As evidenced in the research in this edition, high-enrollment foundation or gateway courses are of particular interest for pioneering initiatives regarding adaptive courses, given these courses have been identified as obstacles to degree completion.

The research studies in this special edition share findings from five institutional implementations of adaptive courseware solutions and one additional study delves into motivations that drive faculty members to adopt adaptive learning technologies. The findings are particularly valuable for institutions currently implementing a digital courseware platform who may be stymied by barriers to adoption addressed in this research. Similarly, this special edition offers significant findings to institutions planning an implementation and seeking strategic advantage through access to peer-reviewed research.

The edition opens with two studies that focus on the functionality of a courseware solution selected for wide-spread adoption at grant-funded institutions. In the first paper, "Adaptive Learning Courseware as a Tool to Build Foundational Content Mastery: Evidence from Principles of Microeconomics," Gebhardt (2018) -- formerly of the University of Colorado Boulder -- studies content mastery through embedded assessments and adaptive remediation. Freshman and sophomore students in Principles of Microeconomics, a large enrollment, foundation course, at Colorado State University were given adaptive learning assignments related to textbook content throughout the semester. The

adopted platform, LearnSmart by McGraw-Hill Education, advances the learner to content mastery in each assignment by continually reassessing the learner's progress, identifying gaps in the learner's knowledge. The adaptive platform then determines the subsequent content based mastery or the need for remediation, thereby personalizing the learning for each student. Notably, this system does not allow for substantive instructor customization. Gebhardt provides a comprehensive discussion of the range of adaptive courseware features, comparting courseware that can be customized to those developed by the courseware, as relatively closed systems. Gebhart's article opens this special issue because the article provides an exceptional entry point for readers interested in the nuanced subsets of personalized learning platforms.

In "A Preliminary Examination of Adaptive Case Studies in Nursing Pathophysiology," authors Hinkle and Moskal (2018) similarly focus on the functionality of adaptive platforms. While the Gephardt research relies on a courseware platform with authored content, the case study by Hinkle and Moskal tracks an adaptive courseware pilot to customize content for their own institution's nursing pathophysiology program. The Realizeit platform was implemented at University of Central Florida (UCF) as an adaptive learning platform shell which allows faculty to create content and assessments that the leverage pre-programmed adaptive algorithms. In this pilot, the authors assess the platform, Realizeit, to determine if the tool delivers on the promise to provide unlimited, unique case studies using parameters authored by the instructor. The authors emphasize the value of case studies in nursing because such studies allow students to analyze clinical problems based on real-life scenarios. The authors report that, in traditional nursing curricula, static case studies put students who need remediation at a significant disadvantage. For students who elect to revisit and practice, adaptive courseware provides content adapted using instructor designed variables. Nursing students in this pilot received unique case studies based on content they elected to practice. The Hinkle and Moskal study includes a complete explanation of how UCF supports the adoption of a platform that relies on faculty to provide content, assessments, and the associations that establish the learning pathways.

The next four research studies provide a range of solutions to one of the most significant identified barriers to scaling the use of courseware, faculty adoption. This section begins with a longitudinal study of faculty technology adoption at a large research institution. In "Passing the Baton: Digital Literacy and Sustained Implementation of eLearning Technologies," Herckis (2018 incorporates ethnographic methods, material analyses, a survey of faculty, and a series of semi-structured interviews over two phases of the study. Herckis creates an empathetic profile of tenure track faculty. This immersive paper addresses the

threat to educator autonomy and documents how concepts of academic freedom are expressed through independent use of digital learning solutions. Herckis establishes that a digitally literate faculty members are more likely to possess the resilience to select and sustain implementation of tools independently in their own coursework using a professional network for support. Within this thorough exploration of the motivations that drive faculty to adopt digital learning tools at one institution, the reader will gain insight regarding the role professional networks and commercial resources play in adoption.

The study, "APLU Adaptive Courseware Grant, a case study: Implementation at the University of Mississippi, O'Sullivan (2018)," applies change management theory to the process of scaling a solution across a large campus. It is noteworthy that this implementation included multiple platform options for programs and departments to choose rather than the adoption of a single platform for use throughout the entire institution. This paper tracks the process of establishing a faculty-focused approach and the resulting analysis of stakeholder relationships that supported successful implementation over the three year period of the research study. Faculty, department leads, students and vendors are identified as essential stakeholders. O'Sullivan continues with an in-depth examination of the deficiencies and shortfalls in the implementation plan and offers a wide-ranging series of recommendations. Faculty autonomy is once again addressed, though O'Sullivan places faculty autonomy in the context of the positive role played by vendors in implementing digital courseware solutions effectively.

A regionally proximate study in this special issue, titled "Adaptable Selectivity: A Case Study In Evaluating And Selecting Adaptive Learning Courseware At Georgia State University" (Tesene, 2018), documents the inclusion of faculty input during the selection process of a courseware solution. The study describes Georgia State's centralized approach to the first year of grant funded courseware adoption, which provides a roadmap to the assessment of platform capabilities through the use and adaption of the Courseware in Context (CWiC) framework. The CWiC Framework, developed by Tyton Partners, comprises four components: A Product Taxonomy, a Research Collection, a Course-Level Implementation Guide, and an Institutional-Level Implementation Guide (CWiC, 2016). Use of this framework enables institutional stakeholders to understand the differences among platform options by comparing functional capabilities, allowing stakeholders to reach informed selections. This study highlights to value of intentionality. Faculty inclusion in the pilot process provides a model for institutions seeking to select courseware solutions while addressing known barriers to faculty buy-in.

In the final study, "Achieving a Scaled Implementation of Adaptive Learning through Faculty Engagement: A Case Study," Johnson and Zone (2018), similarly focus on the central role of the faculty member in assuring that an adaptive learning platform is used optimally to inform teaching practices and to guide student interventions. Of particular significance, this study was conducted at Colorado Technical University (CTU), an open enrollment institution that serves a non-traditional student population. Programs at CTU are offered in career-focused disciplines including engineering, computer science, healthcare management, business and management, criminal justice, information technology and nursing. The open enrollment policy at CTU and the non-traditional student population of the institution motivated leaders to seek solutions to better meet the needs of their adult learners. This study tracks the selection of a personalized courseware solution for online programming and outlines the six-year expansion of faculty support that lead to scaling this solution across multiple disciplines. What began as a single faculty training program evolved to an exemplary model of sustained faculty support informed by dashboard data, student feedback and the expertise of an instructional design team.

It is our hope that the compilation of research studies in this special edition of *Current Issues in eLearning* (*CIEE*) informs institutions seeking to adopt and scale personalized and adaptive courseware solutions. Some of the articles focus on the functionality of adaptive and personalized courseware solutions while others provide insight into overcoming know barriers to adoption, especially those barriers related to faculty buy-in. Authors from these papers provide strategic leaders insight while indicating the persistent need for research that leverages analytics to determine student progress towards mastery, and to improve student outcomes.

Personalized Learning Consortium

Association of Public and Land-grant Universities (APLU) is a research, policy, and advocacy organization dedicated to strengthening and advancing the work of public universities in the U.S., Canada, and Mexico. With a membership of 238 public research universities, land-grant institutions, state university systems, and affiliated organizations, APLU's agenda is to build on three pillars: increasing degree completion and academic success; advancing scientific research; expanding engagement. APLU's membership includes 23 Historically Black Colleges and Universities, 17 Hispanic Serving Institutions (HSIs), and 27 Emerging HSIs (between 15 and 24 percent Latino population). APLU institutions serve a large number of low income and disadvantaged students, including over 1 million Pell grant recipients and over 1 million students of color. In addition, APLU represents five related higher education organizations,

including the American Indian Higher Education Consortium (AIHEC), which serves the interests of the nation's 33 American Indian land-grant colleges.

The Personalized Learning Consortium (PLC) at APLU offers participating institutions a robust strategy for understanding, implementing and scaling the use of technologies designed to personalize and improve the education experience. The Consortium emerged from an APLU project funded by the Bill & Melinda Gates Foundation, and it currently operates under the aegis of APLU as a separate dues-funded activity which serves member institutions from a national office that carries out important functions   including: analyses of trends in student success enablement; vendor engagement; piloting adaptive learning technologies; sharing learning data. PLC membership positions universities to better capture the enormous economies of scale inherent in information technology and improve learning for students while containing costs.

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