Establishing a Model for the Design and Delivery of Online Agriscience Learning Environments to Impact Student and Faculty Success

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Introduction

The availability of open access models provides all levels of student's opportunity for college credit, study at a personal pace, and a computer-based setting, which emphasizes a multitude of instructional methodologies tailored to the individual student (Lowerison, Sclater, Schmid, & Abrami, 2006). As a result of the availability of technology, students are gravitating towards less restrictive and more convenient avenues in their education. A three panel, national Delphi Study was designed to investigate the instructional, design, and delivery needs of secondary students, high school agriscience teachers, and post-secondary faculty in Agriculture Education.

Theoretical/Conceptual Framework

The theoretical framework for this study was based on the convergence of three established theories within the field of educational psychology: Moore's Transactional Distance Theory for Web Based Instruction (1993), which identifies the relationship between instructor and student in the online environment where student and instructor are separated in physical and location presence. The Constructivist Learning Model for Information Construction (ICON). Black and McClintock (1996), espoused that constructivist design as an interpretation of authentic artifacts in the context of background materials is a means for developing meaningful and tangible outcomes within the online learning environment. Bandura's Social Learning Theory (1977) is a fundamental aspect of social learning which identifies how students experience learning through group interaction. Bandura (1977) postulated that learning by direct experience would lead to new patterns of behavior being acquired by observing the behavior of others.

Methods

The purpose of this study was to determine the needs for stakeholder groups (Guba & Lincoln, 1989) engaged with online learning modules. The population for this study included ten post-secondary agriculture students, ten secondary agriscience teachers, and nine post-secondary Agriscience Education faculty. Using the Delphi Model for consensus, three distinct expert panels were asked to participate in a three-round study to evaluate statements related to online course design and delivery, online teaching methodologies, and instructional use of multimedia within online course content. To accomplish the purpose, two research objectives were used to guide this study: assess the essential components for the development of a model for the design, application and delivery on online agriculture content, and identify and analyze stakeholder perceptions of instructional design, application of course content and delivery through online learning systems.

Results

Objective one sought to identify and analyze stakeholder perceptions of instructional design, application of course content and delivery through online learning systems. Undergraduate students demonstrated a higher interest when asked their attitudes and perceptions related to mobile technology (cellular, tablet) use for online learning, while

post-secondary faculty indicated little interest in preparing mobile based learning opportunities. Post-secondary faculty and secondary agriculture teachers indicated their support of professional development activities to improve their understanding and application of skills related to online learning development and implementation. All expert panelists indicated strong agreement between the role of online learning and student discussion through faculty engagement through online learning coursework.

Objective two was designed to assess the essential components for the development of a best practices model for the design, application and delivery on online agriculture content. For this objective, undergraduates and post-secondary faculty agreed the use of video for providing online tutorials for online courses, while secondary faculty expressed the need for this type of video to provide foundational instruction for student use. Secondary teachers and post-secondary faculty agreed more often than undergraduates and post-secondary faculty in regards to methodology and best practices for course development, while undergraduates and post-secondary faculty agreed on the role of online learning and the level of quality instruction was dependent on the organizational skills of the instructor and ultimately the usability of the course by students. Additionally, undergraduates and post-secondary faculty demonstrated a significant difference related to ease of use of the course layout, where faculty upload materials, discussion boards, video chat, and assignments, and the use of formative assessment in online environments. Undergraduates indicated their dislike for formative assessment while post-secondary instructors viewed this type of assessment as vital to the success of the student and the mastery of the content of the course.

Conclusions

The three panel Delphi expert groups reached consensus for the development of the Unified Model for Online Learning, Design, and Learning Management Systems. The panel identified three areas vital to the success of online learning: instructional design components, perceptions and attitudes of online learning, and methodology for online learning and course design at colleges of agriculture. This model is intended to be useful in the planning, organizing, development, and implementation of online courses and content. A further conclusion of this study indicated students require clear and concise design of online content and content should be developed for ease of use by faculty for the uploading materials, discussion boards, video chat, and downloading assignments.

Implications/Recommendations/Impact

This study indicated that online learning systems typically are incomplete and do not meet the needs of the major stakeholders in online education. There exists a need to implement the proposed model or individual components of the model based on the needs of students and faculty within colleges of agricultural science. Generational differences exist in the acceptance of online learning related to access through various means of hardware. Specifically, a large discrepancy existed within this study on the importance of mobile technology and its equal use compared to the desktop software. Further study should be undertaken to determine why a difference in attitude exists between undergraduate and post-secondary agriculture education faculty regarding mobile technology. Identifying barriers and perceptions would help educational researchers understand why attitudes vary between the two stakeholder groups with specific technology. Future generations of students will continue to demand easier and more global access to their education. If we do not address their needs

from the practitioner standpoint, our role as educational experts will cease to exist.

References

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review*, *84*(2), 191.

Black, J. B., & McClintock, R. O. (1996). An interpretation construction approach to constructivist design. *Constructivist learning environments, New Jersey, Educational Technology Publications*, 25-32.

Guba, E. G., & Lincoln, Y. S. (1989). *Fourth generation evaluation*. Sage.

Lowerison, G., Sclater, J., Schmid, R. F., & Abrami, P. C. (2006). Student perceived effectiveness of computer technology use in post-secondary classrooms. *Computers & Education*, *47*(4), 465-489.

Moore, M. G. (1993). 2 Theory of transactional distance. *Theoretical principles of distance education*, 22.