

Mobile Learning - Digimapping Phase 2

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PROJECT DESCRIPTION

Introduction

This proposal for Phase 2 of the Digimapping project focuses on continuing the work from Phase 1 which was completed in December, 2017, and funded by a TLEF grant. Phase 1 of the *Digimapping* project, focused on the design and development of a pilot project which entailed the development of a mapping application (*Collector*) and eLearning modules, both of which were designed for iPad delivery. The REN R 441 - Soil Formation & Landscape Processes course was selected for the pilot course in Phase 1 for which 4 eLearning modules were produced along with development of the *Collector* mapping application. As part of Phase 1, a research project was conducted to measure students' use of mobile devices, thus analyzing learning pedagogy through use of these devices and the effects of mobile learning. The initial results indicate a positive response to the use of mobile devices with respect to knowledge retention, access to eLearning content, and use of the *Collector* mapping application. The overall response to the use of mobile devices was positive and represents an acceptance of mobile learning as a methodology which Phase 2 of the project will continue to research. The complete results of this study will be included in the Phase 1 report due by March 31, 2018.

Phase 2 of the project will continue along the same methodology as Phase 1 by using mobile devices, eLearning modules and also include remote field servers (for curriculum delivery) and augmented reality educational technology elements. In this phase of the project both REN R 441 - Soil Formation & Landscape Processes and REN R 210 - Introduction to Soil Science and Soil Resources will be combined into the overall project. Both courses share a degree of common curriculum which could be repurposed for us in both courses (REN R441 & REN R 210), thus providing a more efficient project development process. Therefore, Phase 2 will expand on lessons learnt in Phase 1 through the practical application of mobile devices and also the research conducted. Phase 2 will increase the opportunities for student learning through a more flexible and robust design and delivery of the curriculum. The overarching design and delivery methodology in this phase will involve the use of a remote field computer server, eLearning modules, augmented reality application, and the *Collector* application - all available through mobile devices.

Part A: Field Study Methodology

The design and development of the course content will be expanded in Phase 2 to include the use of both IOS and Android devices as mobile options for accessing the course curriculum. Students participating in the field studies aspect of the 441- Soil Formation & Landscape Processes course will be able to access the course curriculum from either their own devices or by mobile devices that are on loan from the the faculty of ALES. The model for design and delivery will be based on the premise of utilizing a mini-computer in the field location which will house the learning management system, and therefore all of the course materials, eLearning modules, activities, and assessments. The mobile devices will include the *Collector* (ArcGIS Collector ve. 17.0.4) application with digital maps make available for the entire Alberta extent and the ARIS augmented reality application.

Remote Mini-Computer

As part of the remote field study classes, this phase of the project will include a mini-computer that will be utilized in field study locations. The mini-computer will be installed with a Learning Management System (LMS), mobile mapping application, and mobile eLearning module application. Students and teachers can log into the mini-computer which will be configured as a server to thereby make all of the learning materials available in a remote network area. Access to the mini-computer can be achieved through any mobile device and therefore, students and teachers can then view and interact with course content according to the study plan for the fieldwork.

eLearning Modules

Both REN R 441 - Soil Formation & Landscape Processes and REN R 210 - Introduction to Soil Science and Soil Resources will utilize the eLearning modules. Given that there is shared curriculum content between both REN R 441 and REN R 210, the eLearning modules will be used in both the field study and lab study aspects of the project. The eLearning modules are self-paced and will be available to install on any mobile device or laptop computer in the field setting. In addition, these mobile eLearning modules can be accessed at any time and can function off-line without a network is not available. The modules will include self-assessment questions in order to guide the student through the concepts related to each topic for the field study aspect of the course.

Augmented Reality Mobile Application

Educational technology and more specifically augmented reality (AR) has the potential to offer a highly realistic learning experience supportive of complex learning. AR is a technology that adds virtual content to the physical real world, thereby augmenting the perception of reality. In Phase 2 of this project we will be utilizing an augmented reality (AR) application to enhance the learning experience for both teachers and students during the remote field study aspect of the course. The augmented reality software is capable of creating location-based interactive games, quizzing, or collect images or video through a mobile device related to the augmented experiences. Learning activities such as collecting data, decision tree (branching-based decision making), or team-based learning events can also be embedded into the AR application.

Part B: Lab Study Methodology

The teaching and learning methodology for the lab study work would involve the implementation of iOS and Android devices for teaching and learning in the soil science RENR (210) Introduction to Soil Science course laboratory work. Students will be provided with mobile tablet devices with applications to enhance their learning experience in the lab section of the course. The Alberta Soil Information Viewer and eLearning modules will allow students to research geospatial data through the ArcGIS online mapping tool and also work through interactive modules in the eLearning application. The eLearning modules, which would be self-paced, will be available to install on any mobile device or laptop computer in the lab setting. The eLearning modules produced for the field study aspects of the REN R 441- Soil Formation & Landscape Processes will be utilized in the lab study section of REN R 210 - Introduction to Soil Science and Soil Resources, thereby providing a more efficient use of shared curriculum content.

Interactive PDF Learning Journal

Development of an interactive PFD file will serve as a guide for student learning activities related to lab work. The interactive PDF will include course curriculum, images, embedded video segments, and self-assessment quizzes. The approach for the curriculum content will encompass a stylized design so as to include an emphasis on layout and overall design to encourage engagement by students, thus providing an easy to navigate document. The PDF journal will include chapters of curriculum content by topic(s) and integrated self-assessment quizzes, video segments, and links to curriculum-related websites.

References

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