GEOWAPP: A GEOSPATIAL WEB APPLICATION FOR LAB EXERCISES IN SURVEYING

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E-learning applications that allow students to review their survey data are not widely used in surveying Engineering. To design and develop such an application, the requirements to be studied include user interactions, technology interactions, existing exercises, data representation, etc. This study comprises the process of designing, developing, and testing a geospatial web application (GEOWAPP), which is intended to be under the adjunct mode of e-learning. Four exercises were supported by GEOWAPP: two levelling exercises, a traversing and a topographic survey exercise. The GEOWAPP contains five tools: Traversing Comparator, Differential Levelling Comparator, Least Squares Levelling Tool, Vertical Comparator, and Proximity Comparator. After testing using surveying real data and book exercise data, the GEOWAPP functionality was found operational. Finally, user reviews were favourable towards the GEOWAPP. This application provides a new way to support surveying exercise lab practices by delivering immediate feedback.

1. Introduction

The availability of Internet resources has opened new opportunities for interactive ways of teaching. For instance, online academies exist (e.g., Khan Academy) and universities (e.g., Curtin University, Australia) that offer training in areas such as English, business, database management, web development and others: Stanford University offers MOOCs (Massive Online Open Courses). This trend suggests looking for new interactive ways to apply e-learning in other areas. Commonly, universities use learning management systems (LMS) to deliver content such as handouts, instructions and extra resources. For instance, the D2L (Desire to Learn) LMS is used at the University of New Brunswick (UNB). LMSs are developed to provide services to all areas of study. Because of this generalization, there are specialized practices that are not supported in some areas, such as surveying engineering. In these practices, surveying students often fail the requirement set by instructors. This failure is caused by student inexperience in analyzing the data. Also, students may not know that their computations or measurements are wrong until they deliver the assignment. These situations can be improved by developing a web application that validates student data.

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