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Discovery Learning: Virtual Geo-informatics Workshop for Construction & Structural Engineering Curricula

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Abstract:

Discovery Learning is a method of inquiry-based instruction and is considered a constructivist based approach to education. The knowledge to be covered in Geo-informatics (Undergraduate Modules: BC2123/BC3144/ BC3144F/BC3144P/ BC4145/ BC4157) for Construction & Structural Engineering (CSE) Curricula is extremely intense and dynamic. Traditional didactic lectures have been considered ineffective for today's educational needs, i.e. critical analysis and active participation. Some engineering specialists proposed the use of a Geo-informatics Day Camp (with intensive fieldwork sessions) for tertiary teaching. The proposed new development of Virtual Geo-informatics Workshop stresses the application of the real survey cases with both theoretical knowledge and D&I skills for students, which are lacking in traditional training.

Virtual Geo-informatics Workshop (VGW) which can trigger students' higher level learning do exist in the CSE practice, despite those fieldworks are rarely consolidated and structured in a logical way for teaching purposes. There are high possibilities that the VGW could be adopted in Geo-informatics with Engineering Surveying techniques especially for tutorials sessions. However, high-quality case-based tutorials do require a lot of valuable teaching resources. VGW may be an effective mean for introducing case-based learning to Geo-informatics programmes. Discovery learning takes place in problem solving situations where the student draws on his own experience and prior knowledge and is a method of instruction through which students interact with their environment by exploring and manipulating objects, wrestling with questions and controversies, or performing surveying experiments.

This investigation strives to identify surveying cases relevant to the CSE curricula, and to these will be developed into teaching materials for Geo-informatics & Engineering Surveying. With the case study materials, a web-based multimedia learning centre for Geo-informatics in CSE curricula will be derived.

Extensive validation and verification will be conducted with teachers and students of CSE programmes to determine the effectiveness of the web-based VGW. It is envisaged that this investigation will put HK into the leading edge of applying the use of VGW in engineering education.