

Project Title : The Geospatial Education Forum (GEF) : Resolving the challenges of a New Geospatial Education Curriculum

Leading University : The Hong Kong Polytechnic University

Participating UGC-funded University(ies) : Hong Kong Baptist University, The Chinese University of Hong Kong, The University of Hong Kong

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Layman Summary of Proposal

Geospatial data plays a significant part of our modern lives and, to many people, making use of it is as easy as interacting with a mobile device. Behind that interaction is a vast array of technologies responsible for the data acquisition and manipulation prior to it arriving on the user's device. Take Google Earth and Maps as examples. Most people see these as almost-infinitely zoomable and searchable maps and images of the world controlled by simple user interfaces. Behind these two software are the efforts of many people working with a broad array of technologies. One effort by a group of academics to itemise the educational aspects of those technologies produced a list of 73 discrete learning topics from 10 domains covering physics, geography, mathematics, computer science, cartography, land surveying, remote sensing and political science.

Designing an academic programme for students wishing to follow a career in the geospatial domain is thus a daunting task and presents many challenges to teachers. The current trend is for an academic programme to pick a focus area and minimise or even ignore the presence of other topics with the result that graduates see only a limited part of the geospatial domain. The goal of the GEF is to draw together educators from a range of constituent disciplines to identify critical limitations to their academic programmes and to propose a New Geospatial Education Curriculum (NGEC) that will produce widely knowledgeable geospatial graduates. This will be achieved via three activities - fora, workgroups, and mock classrooms - and will be supported by two pieces of infrastructure - a Geospatial Education Society and a Geospatial Education Platform.

The fora will be held amongst academic leaders of geospatial education (GeoEd) and will identify the key elements of the NGEC and the challenges they will present to geospatial educators at both the secondary and tertiary levels. The workgroups, made up of selected educators, will then develop solutions to those challenges (teaching methodologies, strategies and materials) which will ultimately be tested in the mock classrooms whose students will be geospatial educators from both secondary and tertiary institutions and some undergraduate students.

The advantages of this approach are twofold. Firstly, by involving educators from different levels of GeoEd an in-depth evaluation of the project is possible and misinterpretations of the challenges at different levels can be identified and remedied. Secondly, by bringing together participants from a wide range of domains a synergy will be created amongst geospatial educators so creating a better understanding of the wider scope of the geospatial domain and the associated education challenges.

Layman Summary of Final Report

Geospatial data plays a significant part of our modern lives and, to many people, making use of it is as easy as interacting with a mobile device. Behind that interaction is a vast array of technologies responsible for the data acquisition and manipulation prior to it arriving on the user's device. One effort by a group of academics to itemise the educational aspects of those technologies produced a list of 73 discrete learning topics from 10 domains covering physics, geography, mathematics, computer science, cartography, land surveying, remote sensing and political science. The scope of GeoEd is immense.

The first objective of the GEF was to produce a framework for a New Geospatial Curriculum (NGC) that would allow programme developers to relate their specific education requirements to the broader reality of GeoEd. Through interviews and a forum with the team members, the project team categorised Geospatial-related disciplines in terms into a framework of how they make use of Geospatial concepts, whether they focus on use or on acquisition. The framework consists of two sections: the Practical-Technical field, focusing on data acquisition, and the Conceptual-Analytical field, focusing on data use. From this framework, the NGC was built, which attempts to bring together the common topics taught under GeoEd.

The NGC will present new challenges to educators who are familiar with only a

subset of the curriculum. Several of those challenges (Objective 2) were identified and various tools developed (Objective 3) to assist GeoEd practitioners overcome them. The tools are divided into two classes: those that relate specifically to the Geospatial domain, and those that relate to teaching. All of the tools, including the NGC, are available on the project's web site (the [GEP](#)) along with an online forum, the Geospatial Education Network (GEN), that allows GeoEd practitioners to share curriculum and teaching-related thoughts and ideas so furthering and sustaining the impact of the project.

All four of Hong Kong's UGC-funded universities involved in GeoEd participated in the GEF. Both senior and junior academic staff had input during the forum, workgroup and workshop thus shaping the project's deliverables. Two of the items, the NGC and the Subject Diagnostic Tool (SDT) were found to be especially useful. The NGC for the reasons mentioned earlier and the SDT for its ability to evaluate programme content ranging from individual subjects to complete curricula for conformance to the intended learning outcomes.

Another important tool, the Geospatial Reference Book (GRB) has wide-spread significance, especially for Hong Kong's position in GeoEd in the region. The GRB provides a unique interface between students and the jargon found in GeoEd. It's also presented in three languages: English, Traditional Chinese and Simplified Chinese.

Other outputs (Geospatial 'O' Diagram; Assignment Effort Table; Finding, Learning, Incentive, Practice (FLIP) guide; Intended Learning Outcomes Help Sheet; Grading Rubric Help Sheet) are applicable to other educational domains besides the Geospatial so widening the relevance of the GEF beyond this domain. The participation of colleagues from the Education Development Centre of The Hong Kong Polytechnic University ensured the validity of these tools.