

## **Attitude Of Undergraduate And Graduate Students Towards Free And Open Source Software For Geomatics In A Supervised Self-Study Context**

Jos Van Orshoven<sup>1,2</sup>, Klaartje Verbeeck<sup>1</sup> and Stien Heremans<sup>1</sup>

Katholieke Universiteit Leuven, <sup>1</sup>Department of Earth & Environmental Sciences and <sup>2</sup>Spatial  
Applications Division (SADL), Celestijnenlaan 200<sup>E</sup>, BE-3001 Leuven-Heverlee, Belgium,  
jos.vanorshoven@sadl.kuleuven.be

### **INTRODUCTION**

The ongoing debate about advantages and disadvantages of FOSS4G in education (e.g., Steiniger and Bocher, 2009) suffers from a lack of factual data about the student's perception and appreciation. In order to provide such data and contribute to the debate, we conducted a web-based questionnaire survey with the participants in two academic courses dealing with FOSS4G, one at undergraduate and one at graduated level. This survey complements other surveys we have recently conducted, addressing the use of FOSS4G in educational initiatives targeting students from developing countries (Abu El Nasr and Van Orshoven, 2008; Van Orshoven et al., 2009).

### **CHARACTERISTICS OF COURSES AND SURVEY**

The introductory and advanced academic courses on Geographic Information Science and Technology were conducted in the fall semester of 2009. In the practical part of the former we exposed the 20 undergraduate students amply to free and open source software for geomatics (FOSS4G) and Quantum GIS, GRASS and R in particular. In the advanced course 25 graduate students participated. It focused on geospatial database concepts and applications and encouraged students to work with the FOSS4G PostgreSQL/PostGIS in combination with Quantum GIS. In previous issues of both courses well established commercial and closed software for geomatics (CCSS4G) were used. Together with the shift to the aforementioned FOSS, also the teaching approach of the practical parts of the courses was altered from a more traditional computer class-based design to an explicit supervised self-study (SSS) design (Aernoudt et al., 1999). This implied that students were expected to elaborate assignments at home for which, in addition to the software, also instructions and datasets were available online. To introduce the assignments and provide intermediate guidance and personalised advice to the students, four non-compulsory sessions accounting for a total of five contact hours were organised. Moreover, students could obtain support by e-mail. In the traditional approach students would have been expected to work in a computer class for a minimum of 13 hours for the introductory course and 26 hours for the advanced one. About one month after the students delivered the final assignment reports but before the theoretical exam, we conducted a web-based questionnaire survey for the two courses to gain insight into the student's appreciation of the revised course format. The surveys encompassed questions of the multiple choice, multiple answer and open type.

### **RESULTS AND DISCUSSION**

The results show that the graduate students were very comfortable with the combination of the self-study approach and the FOSS4G. 82% of the respondents expressed their preference for the SSS/FOSS over the more traditional format. 18% had no preference for the one or the other format. Only one student reported noticeable difficulties with the technicalities of the software. Most of them highly appreciated the possibility to tackle the assignments autonomously at convenient locations and times. The opinions of undergraduate students were much more diverse. Not less than 35% preferred the traditional format according to which assignments are elaborated in a university computer room using well established software in the presence of an experienced teaching assistant. 30% was indifferent to the course format. 55% had experienced considerable difficulties in installing or getting

operational the software. Both groups of students acknowledged the potential for further use of the FOSS4G in other courses or for research work but only 15% (undergraduate) and 14% (graduate) had already taken the step. We learn from these surveys that mature graduate students, most of whom have already had a prior experience in using CCSS4G and other free or proprietary software packages in a traditional course setting, clearly prefer the SSS-approach implying FOSS4G. The combination of PostgreSQL/PostGIS (with SQL) and QGIS seems to be a robust solution for conveying principles and practice of RDBMS-based geospatial data management and processing. Undergraduate students seem to prefer a more structured learning environment. This is probably due to their limited prior experience to deal independently with free downloadable less-than-perfect software, solve technical problems which occur along the way and manage the course expectations independently.

## CONCLUSIONS

The availability of FOSS4G clearly facilitates the introduction of the supervised self-study approach in academic education related to GI S&T. Mature, graduate students like Master and post-Master-students expressed clear appreciation for this combination of SSS and FOSS4G in an advanced course. Undergraduate students are more reluctant. They seem to prefer a more traditional in-class format with the presence of an experienced teaching assistant. These results encourage us to continue exposing graduate students to FOSS4G in the SSS-spirit. For undergraduate students, we may either return to the traditional in-class format or provide even more strict tutorials, software installation instructions and answers to FAQ.

## BIBLIOGRAPHY

- Abu el Nasr, A. and J. Van Orshoven, 2008. CSS or FSS for education in GIS ? Proceedings (L. Bernard, A. Friis-Christensen, H. Pundt and I. Compte, eds.) of the 11th AGILE International Conference on Geographic Information Science 2008, Girona, Spain. CD-ROM: 73\_DOC.pdf and [http://plone.itc.nl/agile\\_old/Conference/2008-Girona/PDF/73\\_DOC.pdf](http://plone.itc.nl/agile_old/Conference/2008-Girona/PDF/73_DOC.pdf) : 9 p.
- Aernoudt, E., J. Decorte, J. Elen, M. Hellemans, G. Laekeman, F. Lammertyn, J. Lowyck, S. Neetens, H. Pauwels, J. Ramon, J. Van Thienen, G. Volckaert and B. Wylin, 1999. Begeleide zelfstudie: een totaalconcept voor het onderwijs aan de K.U.Leuven. Internal report K.U.Leuven available at <http://www.kuleuven.be/admin/du/niv3p/du-i33.htm>.
- Steiniger, S. and E. Bocher, 2009. An overview on current free and open source desktop GIS developments. International Journal of Geographical Information Science 23-10:1345-1370.
- Van Orshoven, J., R. Wawer and K. Duytschaever, 2009. Effectiveness of a train-the-trainer initiative dealing with free and open source software for geomatics. Proceedings (J.-H. Haurert, B. Kieler, and J. Milde, eds.) of the 12th AGILE International Conference on Geographic Information Science 2009, Hannover, Germany. IKG, Leibnitz Universität, ISBN 2073-8013. CD-ROM: 136.pdf and [http://plone.itc.nl/agile\\_old/Conference/2009-hannover/pdfs/136.pdf](http://plone.itc.nl/agile_old/Conference/2009-hannover/pdfs/136.pdf) : 9 p.