

Global Trends in Surveying Education – and the Role of FIG

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Basically, the surveyors have been dealing with the same tasks for centuries. However, even if the core areas of cadastral surveying and land management are still the same, the paradigms and tools to be used must constantly be adapted to technological development as well as to the ever changing societal and administrative conditions. This of course imposes all kinds of challenges upon our profession and educational institutions. Furthermore, issues such as curricula development, quality assurance, continuing professional development, and mutual recognition are crucial to any professional organisation at national regional or international level. The issues become even more acute when looking at the challenges facing the surveying profession.

FACING THE CHALLENGES

It may be that the profession has failed to adapt to the changing conditions of the market. In many countries, the profession consists of and is characterised by the traditional profile of “Land and Cadastral Surveying”, and the focus may be more on protecting existing positions and tasks than on adapting to new challenges.

It may also be that the educational base has failed to produce graduates being suitable for a changing market. In many countries, the curriculum is mainly lecture based and tends to be built on teaching traditional disciplines. In my view, the structure and the content of the curriculum must be flexible in order to quickly adapt to changing demands.

Finally, it may be that the general perception of Surveying and the applied scientific paradigms have not been adapted to the demands of a modern and complex society. The promotion of the concept of Geomatics may be seen as an attempt to adapt a new area, even if, in my opinion, the perception of Geomatics is still too technical and too much focused on engineering disciplines.

The cadastral identity may be seen as the strength or as a weakness. In the academic world it should be seen as the strength because of the unique professional focus and the need for a multidisciplinary approach in designing the curricula. Within professional practice, however, the cadastral identity may be seen as a weakness. The perception of the traditional surveyor (and the green rubber boots) may be a little old-fashioned and it may not be attractive to highly qualified students. Furthermore, the cadastral area in many countries is a legal or factual monopoly for the surveyors, and this may lead to a lack of dynamic potential within the profession.

GLOBAL TRENDS IN SURVEYING EDUCATION

Even if the professional content of the curricula vary between countries and regions, some general trends may be identified:

- A focus on **Management Skills** rather than specialist skills. The changes in the surveying profession and practice and especially the development of new push button technologies has voiced the need for including the core discipline of management as a basic element in today's surveying education. Technological developments take the skill out of measurement and the processing of data. The skills of the future lie in the interpretation of the data and in their management in such a way as to meet the needs of customers, institutions and communities. Therefore, management skills will be a key demand in the future surveying world. In short, the modern surveyor has to be capable not only of managing within change but managing the change itself.
- A focus on **Project Organised Education (PBL)** rather than subject based education. The traditional focus on acquisition of professional and technical skills (knowing how) often imply an “add-on” approach where for each new innovation one or more courses must be added to the curriculum to address a new technique. This approach should be modified by giving increased attention to entrepreneurial and managerial skills and to the process of problem-solving on a scientific basis (knowing why). In general the focus of university education should be more on “learning to learn”. The aim is broad understanding of interrelationships between different fields and the ability to deal with the unknown problems of the future.
- A focus on **Virtual Academy** rather than classroom lecture courses. Distance learning and the web tends to be integrated tools for course delivery, which may lead to the establishment of the “virtual classroom” - even at a global level. The computer cannot replace the teacher and the learning process cannot be automated. However, there is no doubt that the concept of virtual academy represents new opportunities especially for facilitating for process of learning and understanding and for widening the role the universities. The traditional focus on the on-campus activities will change into a more open role of the universities aiming at serving the profession and the society.
- A focus on **Lifelong Learning** rather than just vocational training. There was a time, when one qualified for life, once and for all. Today one must qualify constantly just to keep up. It is estimated that the knowledge gained in a vocational degree course has an average useful life span of about four years. The concept of lifelong learning or continuing professional development (CPD) with its emphasis on reviewing personal capabilities and developing a structured action plan to develop existing and new skills is becoming of increasing importance. In this regard, university graduation should be seen as only the first step in a lifelong educational process.

A LAND MANAGEMENT APPROACH TO SURVEYING EDUCATION

Taking a land management approach to surveying education, there is a need to change the focus from being seen very much as an engineering discipline. Surveying, mapping and GIS are clearly technical disciplines (within technical and natural science) while cadastre, land management and spatial planning are judicial or managerial disciplines (within social science). The identity of the surveying profession and its educational base therefore should be in the management of spatial data, with links to the technical as well as social sciences.

The systems of land administration have moved away from being "provider" driven to now being "user" driven. They are interdisciplinary by nature and they will require skills for management and problem-solving in order to serve the clients. The ability to access, to interact with and to contribute to a wide range of public and private databases at a distance will become the norm in many areas of surveying. Again, this will change the skill-base of the surveying workforce, the structure of the organisation and, especially, the tasks of those surveyors holding managerial responsibilities.

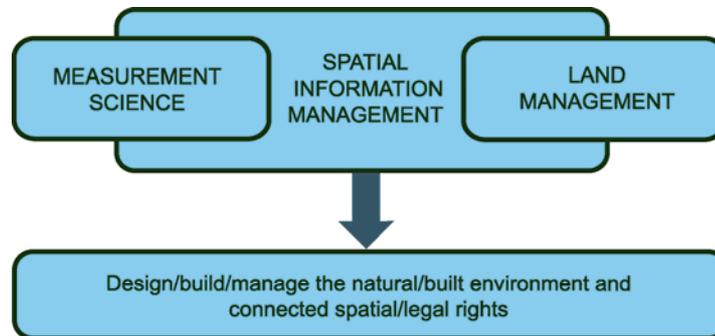
There is no doubt that the main challenge of the future will be that the only constant is change. To deal with this constant change the educational base must be flexible. The graduates must possess skills to adapt to a rapidly changing labour market and they must possess skills to deal even with the unknown problems of the future. The point is that professional and technical skills can be acquired and updated at a later stage in ones career while skills for theoretical problem-solving and skills for learning to learn can only be achieved through the process of academic training at the universities.

THE EDUCATIONAL PROFILE OF THE FUTURE

The developments as discussed above have a significant educational impact. There is a need to change the focus from being seen very much as an engineering discipline. There is a need for a more managerial and interdisciplinary focus. The strength of our profession lies in its multidisciplinary approach.

The universities must act as the main facilitator within the process of forming and promoting the future identity of the surveying profession. Here, the area GIS and, especially, the area managing geographical and spatial information should be the core component of the identity. This responsibility or duty of the universities should be carried out in close co-operation with the industry and the professional institutions.

A future educational profile in this area should be composed by the areas of Measurement Science and Land Administration and supported by and embedding in a broad multidisciplinary paradigm of Spatial Information Management. Such a profile is illustrated in the figure below.



THE EDUCATIONAL PROFILE OF THE FUTURE

PROFESSIONAL COMPETENCE

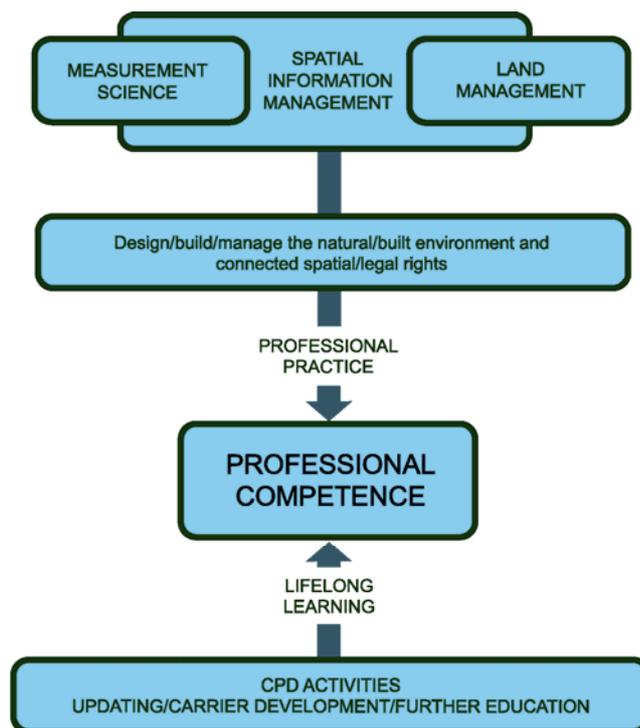
The term professional competence relates to the status as an expert. This status cannot be achieved only through university graduation and it cannot be achieved solely through professional practice. University graduation is no longer a ticket for a lifelong professional carrier. Today one must qualify constantly just to keep up. The idea of “learning for life” is replaced by the concept of lifelong learning.

The response of the surveying profession, and many other professions, to this challenge has been to promote the concept of continuing professional development (CPD) as a code of practice to be followed by the individual professionals on a mandatory or voluntary basis. Maintaining and developing professional competence is of course the responsibility of the individual practitioner. This duty should be executed by adopting a personal strategy which must be followed systematically. Implementation of such a plan, however, relies on a variety of training options to be offered by different course providers.

The individual practitioner should be able to rely on a comprehensive CPD concept which is generally acknowledged by the profession and which is economically supported by the industry. Furthermore, the practitioner should have a variety of training and development options available for implementation of his or her personal plan of action. The options should be developed by the universities offering for example one-year masters courses as part time studies based on distance learning. Option should also be available from private course providers offering short courses for updating and just-in-time training. These options should be developed in co-operation between the universities, the industry and the professional associations.

Furthermore, the individual practitioner should be able to rely on a comprehensive concept for getting his or her professional competence recognised in a regional and global context. There is an attraction in developing and extending such a principle of Mutual Recognition of Professional Qualifications. Mutual Recognition allows each country to retain its own

kind of professional education and training because it is based, not on the process of achieving professional qualifications, but on the nature and quality of the outcome of that process. In turn this should lead to enhancement of the global professional competence of the surveying profession.



THE PROFESSIONAL COMPETANCE MODEL

In short, enhancement of professional competence relies on an efficient interaction between education, research and professional practice. To facilitate this interaction is the true challenge of the new millennium. This calls for increased international co-operation. FIG is ready to play a key role in this regard.

REFERENCES:

Further information is available on the FIG website www.FIG.net. The following key publications are recommended:

Enhancing Professional Competence of Surveyors in Europe. CLGE/FIG, 2001.

<http://www.fig.net/pub/CLGE-FIG-delft/report-1.htm>

Continuing Professional Development. FIG publication no. 15, 1996.

<http://www.fig.net/pub/figpub/pub15/figpub15.htm>

Mutual recognition of Professional Qualifications. FIG Publication No. 22, 2002.

<http://www.fig.net/pub/figpub/pub27/figpub27.htm>