

# **Geomatics and Land Management Changing Profile and Career, UK and RICS Experiences**

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**Key words:** education, geomatics, land management.

## **ABSTRACT**

In a changing world there is a need to consider both the academic content of degree programmes of professional education and the career prospects for geomatics graduates. The academic programmes and the employment prospects of the past were ideal for the traditional land surveyor, but times have changed, as have career opportunities.

The future of the dwindling number of land surveying and geomatics departments must be questioned, as too must the employment prospects of their graduates. These may be related to the changes that took place during 2000, for example, concerning the structure of the RICS, in which 7 Divisions became 16 Faculties. It had been traditionally accepted that surveyors would be able to practice in the division in which they qualified. However, since the changes to the structure of the RICS, members are now eligible to join up to four faculties, although only qualified in one. This degree of wider involvement may be used in the design of future degree programmes. It would no longer be appropriate for surveyors to qualify within a single faculty, and therefore, the discipline of degree courses and subsequent expertise gained in practice needs to be broadening in line with the increased number of faculties. One scenario could be programmes that would lead to membership of the key faculty, for example Geomatics, plus up to three others as options dependent upon the interests of the undergraduates and availability of suitable modules in the degree programme. For example, a degree programme could be directed towards four complimentary faculties, such as Geomatics, Rural, Planning, and Environment, which could result in Geomatics being provided as a Land Management style course with rural, planning and environmental specialisations.

This paper will set out a new strategy for professional education and employment in geomatics based upon the above considerations.

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## **1. INTRODUCTION**

It is a matter of some concern to the authors that despite the changed opportunities in the course content of many geomatics degree programmes, the graduate is faced with a narrower career opportunity than would be preferred given a broader programme content. The consequence of the current policy is to make the degree course content more specialised, which could potentially have the affect of reducing the range of initial career options for the graduate and in a future career in geomatics. It is suggested that by broadening the course content to permit specialisation in the wider area of land management, the geomatics graduate would have an extended employment opportunity.

Over the last decade, there has been a significant reduction in the provision of land surveying and geomatics undergraduate programmes throughout the world (Dixon-Gough, 2000). The reduction of the number of degree courses is not always consistent with the demands for the surveyor. The example in South Africa is an extreme, as degree courses at the Universities of Witwatersrand, Pretoria, Natal, Fort Hare, and Rhodes have closed with the course at the University of Cape Town remaining. Although Polytechnics have provided some of the students that are required in Southern Africa, the overall provision is not being adequately catered for, especially for graduates and those with higher degrees.

## **2. RICS AND AGENDA FOR CHANGE**

In 1999, the Royal Institution of Chartered Surveyors (RICS) produced a document of major importance inviting the members to support changes that would take place in 2000. The object of the proposals was to 'bring the RICS into the new millennia'. This involved changing the existing 7 Divisions into 16 Faculties, changing the Logo, becoming a truly International body, opening an expanding number of branch offices (RICS Australia, RICS Europe, RICS USA, etc.) and, in the process, obtaining recognition as the world's leading surveying institution. The members gave their approval and the proposed actions are currently being undertaken. Agenda for Change (RICS 2000a, RICS 2000b) has led to RICS 2001 and the RICS Global Manifesto (2001). With some 110,000 members in over 100 countries, the RICS is being increasingly called upon to express views and take actions of global significance (RICS 2001).

From the perspective of education, one of the most significant changes that has taken place is the change from Accreditation of courses to Partnership institutions. This is the process of recognising qualifications at degree level that provide exemption from the examinations of the RICS. As a result of this change some universities have chosen to withdraw from the process, whilst others have not reached the levels required by the RICS. This involves a required average 'A' level entry (17 points plus) of the students, acceptance of the course,

research level (RAE rating) of the department, and percentage of graduates entering the profession. The result of the change has been the loss to the RICS of potential Partnership's of a number of academic departments. In the current financial climate that is currently sweeping higher education in the United Kingdom, there has also been a degree of rationalisation of university departments, particularly those offering courses that address the Geomatics Faculty. The number of students wishing to study this discipline has never been as high as those studying degree programme in the other Divisions or Faculties of the RICS. As the result of rationalisation, normally through the quest by the University to have a 'standard' size of Department, most Departments in the UK offering courses in Land Surveying and Geomatics have either been amalgamated into larger academic departments or are likely to amalgamated in the very near future. Some departments, such as the School of Surveying at the University of East London (UEL) have been amalgamated with a number of other academic units to form a much larger School of Engineering, which approximately equates to an academic Faculty. In the case of the former School of Surveying (UEL), the Surveying Subject Area continues to offer undergraduate degree programmes in Land Surveying and Geographical Information Science, and have extended the degree programme to include Civil Engineering Surveying.

The impact of change has also been felt outside the UK where Partnerships have been awarded to over 120 universities in over 50 countries. There is now one university a month outside the UK that achieves partnership. It is, however, noted that this activity is across the wide range of the RICS activities throughout the 16 faculties.

Of interest to most members of the RICS was the opportunity to broaden their membership. Until the change there had been minimal co-operation between the Divisions and all Divisional Council members were from the UK. Until the changes in 2000, the RICS had 7 Divisions. These were:

- |                                       |                          |
|---------------------------------------|--------------------------|
| Building Surveying                    | General Practice         |
| Geomatics                             | Planning and Development |
| Quantity Surveying                    | Rural Practice           |
| Minerals and Environmental Management |                          |

There was very little co-operation between the Divisions and membership was limited to those qualifying within their specific division. Additional Membership fees were charged for joining more than one division, plus the necessary additional qualification.

With Agenda for Change 2000 taking place, the 16 Faculties replaced the 7 Divisions. The Faculties are:

- |                        |                               |
|------------------------|-------------------------------|
| Antiques and Fine Arts | Management Consultancy        |
| Building Surveying     | Minerals and Waste Management |
| Commercial Property    | Planning and Development      |
| Construction           | Plant and Machinery           |
| Dispute Resolution     | Project Management            |
| Environment            | Residential Property          |

The initial interpretation concerning the introduction of the Faculties was that there would be a greater degree of specialisation amongst them rather than the former Divisions. The intention was, however, the converse of that. Initially those members qualified in their original division would move to the appropriate Faculty and use the appropriate designation, but would be entitled to select membership of up to a further 3. There was no additional subscription for joining the additional Faculties.

For those unfamiliar with the RICS, the above list indicates the wide range of professional duties undertaken by members of the RICS. It is of some interest that 6 members of Antiques and Fine Arts Faculty elected to join the Geomatics Faculty as one of their four choices; they apparently have an interest in antique maps and globes.

The RICS (2000b) set out its justification, format, and Faculties' contents in a paper 'Choosing the tools for the job'.

### **3. EDUCATIONAL CONSEQUENCES OF CHANGE**

The changes that have occurred at the RICS question the intentions of those who drew up the 'Agenda for Change' and those who are implementing its proposals. The criteria set for entry standards has benefited the older universities that attract those with a higher 'A' level grades. The older universities have also traditionally enjoyed a relatively low student:staff ratio, and normally achieved higher RAE (Research Assessment Exercise) ratings, due to the availability of funds for research and the demand for academic staff to pursue research as a condition of their employment. The funding per student of the older universities is also higher than that of the 'new' universities. The 'new' universities, formerly polytechnics at which many of the most successful surveying courses have been run, have become disadvantaged through higher student:staff ratios and lower student fees provided by the government. However, they have also traditionally taken students from a wide range of backgrounds, particularly overseas students for whom experience is often used to compensate for academic qualifications through a process referred to as Accreditation through Prior Experiential Learning. With an absence of 'A' level points, such students do not fall with the RICS' 17 'A' level points requirement. It is also pertinent to note that there are many such students who currently occupy senior positions in National Survey Organisations who graduated through the 'new' universities on this basis and who are currently either Associates or Fellows of the RICS, particularly in the new Geomatics Faculty.

The future would seem to rely on the old universities, which do not necessarily have the experience, facilities, relationships with the profession and industry, and educational background of the 'new' universities. This could be a disadvantage for future surveying graduates, who will find it difficult to bridge the gap between theory and application. One possibility is that there might be a decline in the provision of undergraduate courses, which might be 'compensated' for by an increase in Post Graduate courses (e.g., at MSc level) to attract both cognate and non-cognate students. A one-year MSc might not be sufficient for

the non-cognate student unless a longer period of professional competence is demanded. Also of concern is the trend currently taking place in the UK and in other countries, of making the educational programme of the land surveyor and geomatics undergraduate more restricted rather than allowing it to broaden out into other aspects of the surveyors' activities. Within the UK, it has to be acknowledged that the employers drive much of the responsibility of the increased specialisation and this, in turn, has been a requirement of the Universities (for validation purposes) and the RICS (for the former purpose of accreditation).

If one looks at experience in other countries, the first year class at the Technical University of Delft (The Netherlands) has never been so low (Lemmens 2001a). There are only 10 students in the first year of the programme, compared with 40 in final year. The intake usually exceeds the number of those graduating. He, like others, recognises that this shortage is a problem that exists in many other countries. He suggests that the following reasons may be the cause for the shortage:

- Large reservoir of high school students no longer choosing beta studies including technology;
- Low profile of surveying that does not offer sky-high career opportunities;
- Content of surveying studies are perceived as 'fuzzy';
- Poor communication or justification of the logic of the surveying curriculum;
- No need for professionals with knowledge and skills as are currently taught;
- Education, as a commodity, has become too expensive.

As an aside Lemmens (2001a) states "Wealth makes students opt for the easy road."

Lemmens (2001b) has been the instigator of a series in GIM concerning the subject of 'Surveying the Issues of Geomatics Education', which provides valuable additional reading in this subject area. Further authors in the series include Bett (2001), Kenshaw (2001), and Molendijk & Beinart (2001), some of whom have been quoted elsewhere in this paper.

The issues identified above raise a number of appropriate questions:

- Do we require and could we satisfy students who are looking for an easy option?
- Should the degree courses be broadened to include more appealing/relevant subjects?
- Could the profession make itself more appealing and attractive to the potential students?
- Should part time studies be considered a viable option in a means of reducing the cost of education to students?
- Would non-cognate graduates undertaking appropriate Masters courses satisfy the demands of the profession?

One of the problems of the RICSs approach in defining the standards of entry takes little regard of the 'exit velocity' of the students. Dixon-Gough (2000) comments that there is often little correlation between 'A' level points and degree classification. Indeed, the best performing students are almost invariably mature students from the industry who have gained entry to the programme through non-standard entry. In the case of courses offered by the former School of Surveying (UEL), over a period of some 20 years, 85% of all students

gaining 1<sup>st</sup> Class Honours have had non-standard entry criteria, the majority of whom have been commended by the RICS and awarded prizes by the RICS. However, it has been argued that the standards currently set by the RICS should certainly be retained to satisfy the set standards for the retention of Partnership. This situation is currently the subject of discussion between certain Universities and the RICS.

Broadening the degree courses, and in the process making them more attractive and appealing to students and to a wider range of employers, is in part the theme of this paper. Where environmental and sustainable issues dominate the media it would be surprising if potential students were not attracted to these subjects (Bullard 1994). The word 'management' also has a strong response in those seeking a future career. Land is something everybody knows about, though Geomatics is less familiar (Triglav 2001).

Full time employment with part time studies is an attractive option at which Anglia Polytechnic University (APU) is highly successful and it has an appropriate appeal to employers. Similar approaches are also in place at other Universities, for example the University of East London, and the Subject Area of Surveying is currently negotiating with employers in Land Surveying and Geomatics to extend this provision. The need for continuous communication between employers and academic departments is essential to keep all parties involved and satisfied, to ensure that the course content is relevant and that the needs of all potential employers are being addressed (Dixon-Gough, 2000). Molendijk & Beinat (2001) have considered the option of distance learning and there is a clear demand for such products by both potential students and their employers. Such programmes are very difficult and time-consuming to deliver and contacts with students will require to be very carefully established if this process is to be introduced.

The option of allowing non-cognate students who have undertaken the appropriate Masters courses being permitted to seek membership of the surveying community will be dependent on the profession and the needs of the employer. Again, the appeal of courses with appropriate career prospects, suitable course content and higher than average salaries, will attract graduate students.

In his paper at the Council of Europe Geodetic Surveyors (CLGE) and FIG Seminar in Delft, Ledger (2000) acknowledges that the land surveying degree courses in the UK were narrow when compared with similar courses in continental Europe. Cadastre was listed as the most significant subject missing from courses in the UK although this is normally offered, for example at UEL, as Legal and Regulatory Frameworks, and Cadastre and Land Administration. The omission of this very important area should not be so as the UK has a land registration system, and land law is a subject of national and international importance that every land surveyor should be familiar with.

At the CLGE/FIG Seminar in Delft, Mattsson (2000) outlined the evolution of the Swedish land surveying profession with the broad subject area at entry, narrowing down to specialisations in the final years. The specialisation in Land Management and Real Estate Economics are well supported. Of the 16 countries profiled, it is clear that Sweden, together with Finland, Italy, and Belgium have the broadest programmes, with Ireland, Portugal, UK,

Greece, and Spain having the narrowest. Given the hypothesis of the authors that programmes should address all related issues concerning land management, it is clear that those institutions in the UK offering Land Surveying and Geomatics programmes, that they should look very closely to the models provided by those countries offering the broadest programmes.

In Southern Africa, for example, the land reform currently being undertaken is being implemented by tenure reform policies (de Vries 2000), who comments that the need for a Land Measurer and the appropriate educational programme, could lead to a new form of education in Land Management in Southern Africa. The new programme in Land Management could be based on the integration and overlap between 4 major components in the need for local land management. These are the core modules listed below:

- Land measuring;
- Land use planning (both rural and urban);
- Land valuation;
- Land registration.

The new course should satisfy the requirements for land surveyors of the future to undertake the professional duties required in land registration, land tenure and the broader aspects of land management.

Based on the experiences gained at a meeting of UN MOLA (Meetings of Officials of Land Administration) and of the OLLO (Open Learning for Land Office of Hungary), a TEMPUS Project was developed relating to Land Administration in Hungary. This project, in which the author had an involvement, set out the objectives required of the graduate land surveyor for national activities in Land Administration in Hungary (Markus, 2001). Some of the appropriate objectives are listed below:

- Modifications of curricula in Land Administration in Hungary to ensure appropriate training and education for EU accession and maintenance of professional quality;
- Identification of educational pathway for professionals and target groups;
- Development of a credit system;
- Systematic identification and design of modes of delivery;
- Design and adaptation of educational technologies;
- Adaptation of OLLO material;
- Determine means of creating a continuing network of institutions to develop land administration related material;
- Extend the scope of the project beyond the demands of the Land Offices;
- Establish working links between professionals in Land Administration.

What the above experiences demonstrated is that from a developing country, as well as for one in transition, the changing role of the land surveyor has been recognised, especially the need to broaden the syllabus to include subjects like land management. In Western Europe, countries such as Sweden have always recognised the importance of offering a broad educational base prior to opting for specialisation. Others retain their narrow degree

programme in land surveying. This is often at the expense of the graduate and their long-term career prospects, and is of equal importance for the future of the profession,

#### **4. FIG, GEOMATICS AND LAND MANAGEMENT**

Similar to the changes taking place in the RICS from Divisions to Faculties, the titles of the FIG Commissions 7 and 8 have also changed, although these have had a far smaller impact than that encountered at the RICS. While Commission 7 was in the past ‘Cadastre and Rural Development’, and Commission 8 was ‘Planning and Urban Development’, Commission 7 has now been renamed ‘Cadastre and Land Management’, which reflects the need to consider the full aspect of the land management activity. The change suggests that geomatics, together with land management, will have an increasing interest in the specific activities of Commission 7 as well as having an involvement within the other Commissions.

FIG is also broadening its activities: for example, the area of construction, building and quantity surveying will be included in a future Commission 10. As the surveying profession expands its activities in the future, this might well result in additional Commissions. The example of the RICS with 16 Faculties is an example that might be adopted in an amended format.

In the FIG’s Publication No. 5, ‘Surveyors Contribution to Land Management’ (1991), it is stated that, “We have to recognise the global responsibility surveyors have in land management.” There is also an appropriate quote from Dr Arcot Ramachandran, then Executive Director of HABITAT at the opening of the FIG Helsinki Congress in 1990, “Land is the starting point for all settlements, development, and at the beginning of this process stand the surveyors.” These two statements bring together the authors’ vision of the future of Land Surveying and Geomatics, which is not simply in the process of land measurements and the management of that data, but as a profession involved in all stages that constitute land management.

The broad credentials of FIG and RICS as identified above can be seen to be changing for the benefit of the profession. What is needed is for the national professional bodies, together with the academic institutions, to realise and implement the changes that are required to widen the career prospects of graduates and in the process broaden the appeal to new recruits and raise the status of surveyors, as perceived by the general public.

In the FIG No. 5 publication, Henssen (1991) as Chairman of a FIG Task Force presents an appropriate, “Land Management – A Background Paper”. Covering the general issues of land management it is stated that the policy should achieve the stated aims as listed below:

- Spatial (including land use) planning;
- Valuation and taxation;
- Land acquisition and disposal;
- Land tenure and land registration (or cadastre);
- Geographic and/or land information systems (GIS/LIS);
- Institutional factors.



All those aims listed above play an essential part in the process of land development and land management. They also include many of the subjects contained in the more enlightened degree courses, like that at KTH (Royal Institute of Technology) in Stockholm.

Henssen (1991) states that it will be necessary to ensure that the following components become an essential part of the process of land development:

- A knowledge of the actual use of land;
- Planning for the future;
- Implementation of long-term strategies;
- The monitoring and management of land use.

While it is accepted that other professions and disciplines would be involved in the above activities it is strongly suggested that the land surveyor, with an appropriate specialisation and experience in land management will be able to undertake a major role in the process.

## **5. IMPORTANCE OF LAND MANAGEMENT WITH GEOMATICS**

Of the 16 Faculties of the RICS, it is important to consider which additional 3 Faculties a Geomatics graduate would opt for in addition to the Geomatics Faculty. The graduate's past experience, together with all the subjects contained in the degree programme will ultimately influence the selection. The author has opted for membership of the following 4 RICS Faculties:

- Geomatics (qualified in Faculty);
- Planning and Development;
- Environment;
- Rural.

The choice is relevant to the author's qualifications, experience, and past and current employment, research and consultancy experiences. There are other Faculties that could be included with the above list, Valuation and Dispute Resolution to name two. It is suggested that the above selection would be most appropriate for those seeking a career in land management with a geomatics specialisation.

In the UK, it will be important for academic institutions to address the issue of widening their courses to enable graduates to benefit from the opportunity to join up to 4 Faculties. The emphasis could be on land management being added to the syllabus for the institutions currently offering geomatics degrees.

## **6. CAREER PROPECTS**

The career prospects of those persons who qualify in geomatics with a land management specialisation, will be within a broader field of activity than currently available to those who only have the geomatics qualification. The outline of activities as has shown in 4 above illustrates how FIG (1991) anticipates the opportunities for the land surveyor.

The on-going issues of land management, typified by land reform and land consolidation, are activities that land surveyors should be prepared to undertake, provided they have the necessary skills and experience.

Increasingly, career prospects are available in central and local governments, in private practice, the state utilities, and in the privatised sector. With more countries progressing to a market economy, the career prospects for the land surveyor will increasingly be in the private sector.

## 7. CONCLUSIONS

The important issues that need to be addressed are listed below:

- The land surveying profession needs to address its image as well as the expertise it offers to the community;
- The course content of land surveying degrees needs to broaden to take into account the environmental, sustainability, and land management subjects;
- Any degree course that does not provide surveyors with a broad understanding of their national and international land law will not be able to communicate with others involved in land issues;
- Part time courses should be increasingly considered because of the high cost of university education;
- Part time studies, coupled with a requirement of full-time employment, is a good preparation for the career of land surveying graduates;
- Non-cognate degree holders, undertaking an appropriate Masters, will require a longer period of training before being accepted into the profession.

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## BIOGRAPHICAL NOTES

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