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## Enhancing Professional Competence of Geodetic Surveyors in Europe - The idea of a Core Syllabus

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### Abstract

The CLGE's working group on recognition of qualifications proposed the concept of a core syllabus in European geodetic surveying to encourage a higher and more relevant common standard of education and to facilitate the mobility of professional surveying labour around Europe.

This paper explains why the group feel that this approach may not be suitable for the entire European geodetic surveying sector due to cultural and market diversity.

### 1. Introduction

In the Spring of 1998, the CLGE established a working party to explore the value of a core syllabus for geodetic surveying in Europe.

The initial objectives of the project were to explore how a core syllabus could

*"... help employers and those offering contracts to accurately evaluate surveyors with qualifications from other European nations"..."*

and how it could

*"... shorten the process that a surveyor must complete in order to qualify to practice in another European nation with a restricted profession".*

The original output of the working party (CLGE, 1998), presented at the FIG Brighton Congress in 1998, suggested that a core syllabus could help to facilitate these objectives.

The work of the group over the following two years has now concluded that the creation of a core syllabus is neither the answer to bringing about mutual recognition, nor to enhance professional competence across the entire European geodetic surveying sector.

The group believes that the cultural and market diversities that exist across Europe, and also within geodetic surveying itself, mean that a core syllabus could only be useful within certain homogeneous sub-sections of the profession.

This paper explains how these conclusions have been reached, and why the objectives of the overall project have subtly changed, now to be encouraging:

*Evidence and arguments to stimulate improvement of curricula in order to assist the convergence of standards across Europe, and,*

*Information to assist the determination of equivalence of qualifications to facilitate the mobility of professionals between countries.*

## **2. Diversity within the European geodetic surveying profession**

For a core syllabus to be worthwhile, it relies upon a certain level of commonality across its area of coverage. This commonality must be present not just in the subject areas being taught, but also in the academic and professional framework in which the students are participating. Even if it were possible to identify a set of core subjects in which it was felt to be important for all geodetic surveyors to have a minimum level of competence, it would still be a separate task to work out how that level of competence could be attained in different educational systems, and how it could be certified, if at all.

This section looks at both the diversity in the market for surveying services, and the cultural diversity of educational systems across Europe.

### **2.1. Market Diversity**

The subjects that are covered by a course must primarily reflect the areas of knowledge required by the markets that employ surveying graduates. The problem comes where these markets require different areas of competence, both in the technical subjects in which a graduate must be capable, and also in terms of the business and ethical competencies that they need to show.

Furthermore, these market requirements are not static. As time passes, the geodetic surveying market evolves, and courses must adapt their emphases to produce graduates capable of meeting current and future market demands.

There are a number of characteristics of the European geodetic surveying market that show how significant market diversity is as a barrier to a core syllabus.

The definition of a surveyor is a prime example. Various attempts have been made to define what makes a surveyor (see FIG, 1991), and in an attempt at being more specific, the European Geodetic Surveyor (CLGE, 1997). It is suggested though, that an attempt to compare national customary understandings of the terms "surveyor", "land surveyor", or "geodetic surveyor" against these global or regional definitions would result in some quite major discrepancies.

One reason is that certain tasks that are a surveyor's job in one country are part of another professional's remit elsewhere. Where spatial planning is the work of a surveyor in many parts of Europe, some countries have developed an independent profession for spatial planners and although the new profession interacts with surveyors, planning is seen as a separate discipline.

Another reason is that some areas of surveying are not practised at all in certain countries. Sometimes this is for historical reasons, but it is often equally true in emerging markets where a country has not yet developed the economic need for a particular surveying service. Cadastre is a prime example of a branch of surveying that is vitally important to most national surveying professions, but for historical reasons is not practised in a small number of countries including the UK. While cadastre would have to be a compulsory and a large part of the education of many European geodetic surveyors, it is only taught as an optional

subject on most UK courses, intended for the currently small number of graduates who choose to explore a career abroad.

The above two issues still cause a problem where they exist to a lesser degree, i.e. where surveyors do actually pursue a certain area of practice, but only as a minor part of their business. Many course providers will choose not to offer that subject as part of their training as they feel that demand will be low in comparison to the other subjects fighting for space in their curriculum.

## **2.2. Cultural diversity**

Leaving aside the problems concerning the diversity of the markets in which surveying services are offered, there is an equally large issue of contrasting educational models.

The CLGE working party found very early on in its discussions that a core syllabus would struggle to overcome two major issues in European education.

The first issue concerns teaching methods, and can be described as the input versus output approach. The second issue involves the method by which a learning provider is able to declare that it is producing graduates with a certain level of competence. This may be thought of as self-assessment versus accreditation.

### **2.2.1 Input versus output approach**

The initial CLGE paper from the working party (CLGE, 1998) suggested that a core syllabus could be created which would contain a range of subjects that should be taught, along with a measure of how much time as a minimum should be devoted to each subject.

This approach was viewed favourably by a number of European nations, typically those in the South of the region. For many though, the idea of basing a syllabus on what should be presented to students was felt to be inappropriate. Denmark, for example, wanted the emphasis to be placed on the competence with which a student graduated rather than the specific content that they had been taught.

It became clear that a system that proposed one method or the other for influencing course content would almost certainly be ignored as unworkable by a large proportion of the intended academic market.

### **2.2.2 Self-assessment versus accreditation**

A similar cultural diversity exists in the way that academic achievement is perceived by those in industry and the wider profession.

The working party initially suggested a method of accrediting those universities that delivered courses based upon the core syllabus, involving some sort of awarding body with the authority to say whether a course was suitable or not.

This model is very similar to that operating in countries including the UK where the country's professional body, the Royal Institution of Chartered Surveyors, judges courses against a number of criteria before deciding whether to offer accreditation and therefore a route to professional qualification for its graduates.

Again this model was found to be unacceptable in a number of European countries, where a scheme of self-assessment is more normal. Under this system, it is for the university to decide whether its graduates meet a certain standard, and the market is left to determine whether the university's claim is credible. If graduates are at a lower standard than expected, employers will quickly make this clear to the university that trained them.

The contrast in the two systems is a result of a difference of inter-relationship between industry, the profession, government and academia in those countries. The factors that influence the content of courses vary in importance across Europe. In some countries, the job market is the driving force of course content. In other areas, professional accreditation, or government funding may be more of an issue.

### **2.3 Cultural and market diversity leads to curricula diversity**

The issues of cultural and market diversity raise three issues then for a core syllabus:

- Can a core syllabus be created that covers all the important subjects to be learned by surveying students, without imposing unnecessary learning on students of any particular region or specialism?
- If a core syllabus can be defined in terms of subject area, is there a model by which it can actually be delivered to students?
- How can the market or the profession judge whether students are graduating with appropriate levels of competence?

Having raised the potential difficulties with these issues as expressed earlier in this section, the working group were asked to investigate whether the creation of a core syllabus would be possible across geodetic surveying in Europe, in effect judging whether market diversity was too large or not.

The working group needed to determine somehow which subjects should be contained in all course syllabuses. The initial approach taken was to study which subjects were currently being taught by a sample of universities as part of their geodetic surveying courses. The group would then need to decide which subjects being taught reflected what should in fact be taught by everyone.

The group pursued the first step by initially studying the syllabuses of geodetic surveying courses from six countries around Europe. The study also included a comparison of the syllabuses of seven courses from the UK to examine specialist rather than regional focus.

The study was limited in the sense that certain universities were more forthcoming than others in the amount of syllabus detail that they provided, but it still gave a strong indication that much diversity exists.

Within the UK, there was a distinct division between the contents of traditional "land surveying" courses and those focused on geographical information science. Where the former all considered geodesy, engineering surveying, physics, mechanics and instrumentation to be essential, the GI courses preferred to include computer science, software development, and data management. The subjects common to all courses were limited to topographic surveying, statistics, photogrammetry and remote sensing. A core based on these common subjects within the UK would be extremely limited in its use. This is hardly surprising as the expected job profiles of the graduates from these courses are very different, despite all falling within the definition of geodetic surveying.

Comparing course content across Europe also showed significant diversity. Cadastre was again a prime example of a subject fundamental to the syllabus in many countries, yet completely absent in others.

What emerges is that there are certain groups of countries that have quite similar educational content, based on the fact that they have comparable markets for surveying services. Parallels can be drawn between course content within Germany, Austria, Switzerland and France, countries' whose liberal professions show strong similarities. The UK and Ireland also appear to offer similar content to students, reflecting two surveying markets quite close in their demands on skills.

These groups of countries with similar market demands might be a more practical starting point for developing core syllabuses than rather diverse European market. Indeed if these groups with common market demands also have less of a cultural diversity in terms of education and its relationship with the profession and industry, they would appear to be well suited to greater co-ordination in their learning systems. Whether smaller sub-sections of the European geodetic surveying market working together to define standards is beneficial to Europe as a whole is a question for further investigation.

### **3. How can original objectives be facilitated?**

The core syllabus project started out by trying to research how the profession across Europe could facilitate two things:

- To aid the mobility of geodetic surveyors around Europe by providing a mechanism for understanding qualifications from other education systems.
- To minimise the adaptive process that a migrant surveyor would need to make, by encouraging all universities to provide geodetic surveying students with a core level of competence in a set of defined subjects, transferable across the whole of Europe.

Whilst the working group has come to the conclusion that a European core syllabus is not the answer to meeting these goals, the goals themselves are still extremely valid.

The group agreed that more research was needed in two areas:

#### **3.1. Evolution of curricula in recognition of market demand**

Instead of defining what subjects are important to be included in all surveying courses, it may be more productive to acknowledge market diversity and to recognise that the issue for course providers is how they can deliver a course to meet a particular market demand. If market demand differs around Europe and even within single countries, each course will need a slightly different approach and type of content.

A gap between market demand and academic supply could be caused by a lack of understanding of how to meet that demand. To assist in overcoming this gap, research is needed into how successful surveying courses have evolved their content and delivery to provide graduates with the skills and learning ability that the market requires. This type of information should be a valuable resource for universities looking to evolve their courses in the right direction. Professor Hans Mattsson addresses this issue in his paper "The Education and Profession of Land Surveyors in Western Europe" (Mattsson, 2000).

### 3.2. Mutual recognition

To gain a better understanding of how qualified a surveyor is to practice in another country, it should not be a simple case of comparing academic qualifications. While it is undoubtedly important to understand what a graduate has learnt as part of their degree course, it is more useful to potential employers and those offering recognition to a migrant to understand the individual's overall professional competence. A surveyor's ability to work as a professional depends not just on their technical competence but also on their business experience, their ethical standards, and a number of other less obvious factors. Dr Frances Plimmer looks into this matter in her paper "Professional Competence Models in Europe" (Plimmer, 2000).

### 4. Conclusions

For a core syllabus to succeed in leading a profession towards a high common standard of education and simpler transferability of labour across borders, there needs to be a relatively high level of commonality within not just the areas of competence that the market demands, but also in terms of education systems, and the inter-relationship between education, industry, the profession and government.

The CLGE's working party on recognition of qualifications believes that this level of commonality is not present across the whole of the European geodetic surveying sector. There is significant diversity in market demand for surveying services, not just across Europe but also within individual countries. There is a divide in how courses are delivered, and also in how they are recognised as achieving a certain standard.

To enable courses to evolve their content to meet European market demand, it is suggested that more information should be published on how successful courses change their focus and content to reflect market changes.

To facilitate mutual recognition of qualifications, the profession should work towards a clearer understanding of professional competence and how it can be compared across borders.

### 5. References

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- FIG, 1991 - *Definition of a Surveyor*. FIG publication number 2.
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