Inculcating Professionalism in to the University Degrees: Experience of the Faculty of Geomatics, Sabaragamuwa University of Sri Lanka

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Abstract— *The Faculty of Geomatics, Sabaragamuwa University of Sri Lanka is reputed for its BSc degree in Surveying Sciences since its inception in 1997 in its effort to produce professional surveyors. Due to the technological advancements over the past two decades and the vast changes occurred surrounding the surveying profession, a highly specific knowledgeable and skilful individuals who are narrow in the scope were needed to cater the current demand. The Faculty has identified this by conducting a comprehensive stakeholder survey and in 2014; a whole new curriculum was developed with five specializations in Geomatic field. In this process, one of the major objectives was to acclaim the local and international accreditations for the programme. Now, this new degree is accredited by the Royal Institution of Chartered Surveyors (RICS) and the hydrographic specialization programme is recognized for the FIG/IHO/ICA Category-B level. Further, the faculty is also became an academic member of the International Federation of Surveyors (FIG). With these, Faculty of Geomatics became a world-class degree awarding institution in the entire South Asian region in the field of surveying sciences. Finally, producing graduates on a professional field requires comprehensive planning through a well thought curriculum by considering the variations contiguous to the profession and the expectation of the society with respect to the intent graduates. This article describes our experience in this process.*

Keywords— *Professionalism, Spatial Sciences, Surveying Sciences*

I. INTRODUCTION

In 1997, the department of Surveying Sciences introduced the Bachelor of Science (Surveying Sciences) Degree Programme at the Sabaragamuwa University of Sri Lanka (SUSL). This was the first time in the history of the university system in Sri Lanka that such a degree programme was introduced by a university fulfilling a much felt need of the country. This was a four-year special degree programme from its inception. Then in 2004, the Faculty of Geomatics (FoG) was established with two departments; Department of Surveying and Geodesy (SUGEO), and Department of Cartography, Photogrammetry, Remote Sensing & GIS (CPRGIS). The two departments jointly conduct the first five semesters of the degree programme as a foundation course, and within the next three semesters, offer three areas of Specialization as Surveying and Geodesy, Cartography & Geographic Information Systems, and Photogrammetry and Remote Sensing, until 2014.

During its history of over 15 years, a total of about 600 students were graduated since 2002. The Faculty is very proud to state that the employment rate among the past graduates is 100%. The Surveyor's Institute of Sri Lanka recognizes this Bachelors' degree in Surveying Sciences, as a basic academic entry requirement to become a professional Surveyor in Sri Lanka. Additionally, our graduates are much in demand by leading private and government institutions, both locally and internationally in varies of areas in land and construction fields, hydrographic surveying, remote sensing and GIS firms (FoG 2014).

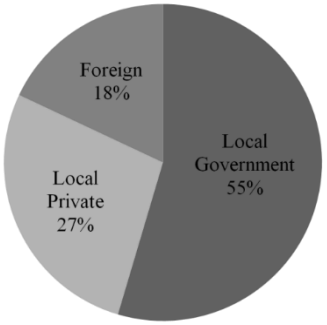

Figure 1: Employment statistics of Surveying Sciences graduates.

In accordance with the latest developments related to Geomatics, the Faculty of Geomatics of the SUSL was prompted to revise the curriculum of the Bachelor of Science in Surveying Sciences in 2014 to meet the needs of the industry and the rapid development of the

technology. Discussions with industrial representatives of the Board of Studies, as well as results obtained from stakeholder feedback, indicate specific needs in the field of Geomatics, such as graduates possessing a high level of technical skills, while being sensitive to the needs of work related to Geomatics. Here, one of the primary targets was to pursue for the relevance accreditations from the international professional bodies.

A. Who is a Professional?

The term professional designates the standards of the education and the training that prepare members of the profession with the specific knowledge and skills necessary to accomplish the role of that profession. Almost all professionals are subject to strict codes of conduct enshrining rigorous ethical and moral obligations. Professional standards of practice and ethics for a particular field are typically agreed upon and maintained through widely recognized professional associations. Where as in some cultures, it is described as a particular social stratum of well-educated workers who enjoy considerable work autonomy and who are commonly engaged in creative and intellectually challenging work. But in most cases, he or she is a member of a recognized professional association which is relevance to their earning of living.

B. What is a Professional Body?

A trade association of an organized profession, which certifies successful completion of its requirements, and subsequently awards a license and confers a recognized designation. Professional bodies usually prescribe a discretionary or mandatory code of conduct for their members. These bodies exercise political control over their membership, and have monopoly over the profession's formal education, certification, licensing, etc. Generally, these organizations are non-profit organization seeking to further a particular profession, the interests of individuals engaged in that profession and the public interest.

C. What is a Surveyor?

According to the International Federation of Surveyors (FIG), a surveyor is a professional person with the academic qualifications and technical expertise to conduct one, or more, of the following activities (FIG, 2014);

- to determine, measure and represent land, three-dimensional objects, point-fields and trajectories;
- to assemble and interpret land and geographically related information,
- to use that information for the planning and efficient administration of the land, the sea and any structures thereon; and,
- to conduct research into the above practices and to develop them.

II. TOWARDS A PROFESSIONAL BACHELOR'S DEGREE

When it comes to professional bachelor's degrees, these programs generally have a different structure than a common Bachelor of Science program, because these professions are regulated by the relevance professional bodies. Usually, most of these curricula focused on the professional training aspects. When it comes to Geomatics, the Royal Institution of Chartered Surveyors (RICS) is the most prestige professional body and most of the national surveying bodies are under RICS's umbrella, including the Survey Institution of Sri Lanka (SISL). Therefore the RICS's Assessment of Professional Competence (APC) requirements were used in benchmarking the revised curriculum of the FoG SUSL.

A. Transformation into OBE

The 21st century education policy is a market driven one due to globalization, hence need to change the way we measure the effectiveness of education. Conventionally, it is assessed based on traditional inputs like total credits earned and duration of the programme. However from the industrial perspective, what they need to know is that what the graduates can do rather than what he or she has completed. This is the whole essence of the outcome based education. The transition towards the outcome-based education is equivalent to the measure of total quality movement in that profession. It reflects a belief that the best way for individuals and institutions to get where they're going is first to determine where they are and where they want to be, then plan backwards to determine the best way to get from one end to the other (Soulsby, 2009).

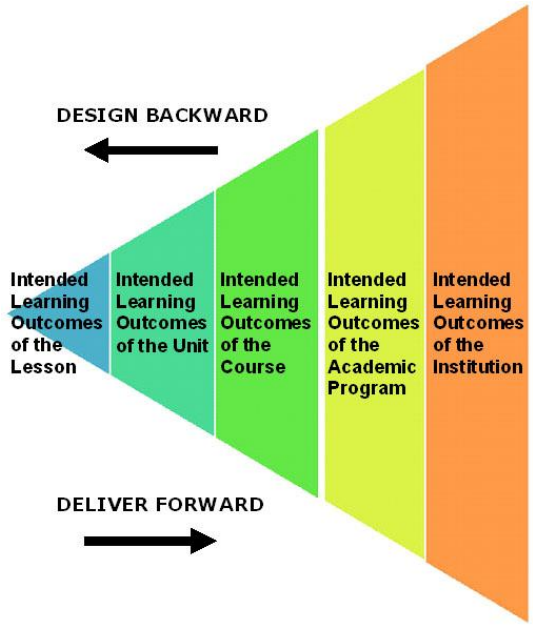

Figure 2: Outcome Based Education Design & Delivery (Soulsby, 2009).

In pursuing this, we analysed the requirements via extensive stakeholders' survey and considered the professional competency levels imposed by the professional organizations in defining the final outcomes in this revision process.

With the evolvement of new technologies and new opportunities enabled surveyors to broaden their skills and competencies than they were traditionally involved as the surveying profession moves into the 21st century. Hence, led to several challenges in defining the outline of the profession. Today it is diversified by encompassing various other activities such as real estate management, digital image processing, engineering design, planning & decision making, and space navigation, etc. The RICS defined some 10 mandatory competency aspects, 12 core competency aspect areas and another 12 optional competency areas leading towards almost 98 specific technical competencies which requires at various levels of its membership (RICS, 2015). This implies that modern surveying programmes must be developed into multi-talented professional people. You may not surprise it may point towards a profession that has difficulty in defining exactly what constitutes its core expertise. It may easily encompass skills which are from different profession in another jurisdiction. Another aspect of the process was to promote student centred education and lifelong learning. Various student centred activities has designed and made compulsory in the curriculum for each course units.

B. Importance of soft skills

In today's competitive job market, one should be capable of multitasking at a time and succeed in all endeavours. Therefore, the key to success is to have sound subject knowledge and be able to present it in an attractive manner. Developing soft skills in graduates help to reach the top and enjoy personal growth. These are important for every person in an organization. Soft skills is a term relating to a collection of personal, positive attributes and competencies that enhance relationships, job performance, and value to the market (Chee, 2009). Simply these skills determine how one interacts with others. In fact, this is one of the main weak points with our graduates. These skills are typically difficult to identify, quantify and measure. Addressing this, five workshop type modules have custom designed in cultivating these skills.

C. Quality control and sustainability

Quality assurance is an important element of curriculum designing and the following methods are practiced to evaluate, maintain and improve the quality standards of teaching and learning methods;

- Students' performance – completion rate, graduating students' performance, feedback from the industrial training.
- Employability – alumina survey & market survey.
- Lecturer performance – student feedback & peer evaluation, lecturer performances.
- Curriculum review – faculty board, course adversary committee, curriculum monitoring committee, programme reviewers and Stake holders' reviews.

All the feedbacks and suggestions are compiled by the faculty quality assurance (QA) cell every semester and annual performance report is prepared and sends to the University QA unit. Further, a course advisory committee has established to evaluate the programme and programme reviewers has appointed from the experienced university academics and industry practitioners. Additionally, from time to time, various training programmes, workshops and seminars will be organised for the university community including academic, supportive and clerical staff in order to

enhance the knowledge and skills of the communities in the university system to deliver an efficient and effective service. Further, the faculty is strongly working on for vary close collaborations industry.

C. Results

There are fifteen programme learning outcomes (PLO) defined covering Knowledge, skill and attitudes and all the individual course units' learning outcomes were mapped in to these PLOs. With the new revision, the Faculty of Geomatics is offering five specializations under two departments as follows;

Table 1: New Specializations in Surveying Sciences

Programme	Department	Proposed Specializations
Bachelor of Science honours in Surveying Sciences	Surveying &Geodesy	Surveying and Geodesy
		Land Management
		Hydrographic Surveying
	Remote Sensing & GIS	Remote Sensing
		Geographic Information System

The revised programme comprises of 133 credits and qualifies the SLQF level 6 for four years BSc Honours degrees. Further, this new BSc Degree in Surveying Science has got the accreditation from RICS and Specialization in Hydrographic Surveying has got the recognition for Category-B level for Hydrographic Surveyors by the International Board on Standards of Competence for hydrographic surveyors and nautical cartographers (IBSC) .

III. DISCUSSION

Royal Institution of Chartered Surveyors (RICS) has accredited this degree programme under the Geomatics stream and the hydrographic specialization programme is recognized for the FIG/IHO/ICA Category-B level. In addition to that the Faculty of Geomatics became an academic member of the International Federation of Surveyors. With all these, Faculty of Geomatics is now offering world-class degree in the field of surveying sciences and it is the only institution in the entire South Asian region to achieve such status.

In order to inculcate professionalism to undergraduates one has to introduce industry oriented course modules and exposed them to real working environments. The soft skills modules help our undergraduates to improve the necessary soft skills the employers seek from their employed graduates, so that they become effective practical professionals. The curriculum development is a continuous process and one must continuously stress on examination of resources, stakeholders' comments, experts reviews and students feedback to ensure a successful outcome for curriculum development and for necessary revision.

Here, it should say that in order to produce graduates on a professional field requires comprehensive planning through a well thought curriculum by considering the variations contiguous to the profession and the expectation of the society with respect to the intent graduates. This implies that these graduates will possess internationally outlined theoretical and practical comprehension of surveying sciences for individuals, with the skill to carry out the various surveying tasks. Therefore, this degree can be considered as a global passport for the graduates to enter the international job market with globally acclaimed qualifications.

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Dr. M.D.E.K. Gunathilaka obtained his PhD and MSc in Hydrography from the University of Technology Malaysia and further he holds a BSc in Surveying Sciences degree from the Sabaragamuwa University of Sri Lanka. Currently he is working as a senior lecturer in the Department of Surveying and Geodesy, Faculty of Geomatics at the Sabaragamuwa University of Sri Lanka. His research interests are in the field of Hydrographic Surveying and Geomatic Engineering.