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IT PROFESSIONAL COMPETENCES AND THE REQUIREMENTS OF THE LABOUR MARKET: EXPERIENCE OF THE UNITED KINGDOM

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Understanding the employment market while defining specific skill sets associated with potential graduates is always important for courses in higher education.

Qualification frameworks are important instruments in achieving comparability and transparency within the European Higher Education Area (EHEA) and facilitating the movement of learners within, as well as between, higher education systems. They should also help Higher Education Institutions (HEIs) to develop modules and study programmes based on learning outcomes and credits, and improve the recognition of qualifications as well as all forms of prior learning

In the UK the role of lifelong learning is to support employability but in the absence of a universal and standardised qualifications framework for employability skills, a number of methods have been developed to bridge this gap. The UK probably has the widest set of established support systems for lifelong learning and employability in the world. In addition to the National Qualifications Frameworks taking account of National Vocational Qualifications (NVQs) for employability, there are Personal Development Plans (PDPs), Progress Files and Employability Offices and Officers.

This paper reviews a number of these and describes how the Skills Framework for the Information Age (SFIA) and its latest version SFIAplus [5] can be used as the reference against which employability skills are mapped. A novel presentation of how the SFIA framework is used at Southampton Solent University in course development to meet employability skills is given.

In order to make students more aware of what employers expect, employability skills are identified and integrated in a new course using SFIAplus [5] which is being used as one of the main drivers for this in course development.

The paper draws to a close by making some brief conclusions and indicating future work.

1 Introduction

1.1 Qualifications Frameworks and Lifelong Learning

Qualification frameworks are important instruments in achieving comparability and transparency within the European Higher Education Area (EHEA) and facilitating the movement of learners within, as well as between, higher education systems. They should also help Higher Education Institutions (HEIs) to develop modules and study programmes based on learning outcomes and credits, and improve the recognition of qualifications as well as all forms of prior learning.

Qualification frameworks should be designed so as to encourage greater mobility of students and teachers and improve employability. National qualifications frameworks should be compatible with the overarching Framework for Qualifications of the EHEA as well as being compatible with the proposal from the European Commission on a European Qualifications Framework for Lifelong Learning.

1.2 The European Qualifications Framework (EQF)

The EQF is a common European reference framework which links countries' qualifications systems together, acting as a translation device to make qualifications more readable. It has two principal aims:

- to promote citizens' mobility between countries and
- to facilitate their lifelong learning.

At the national level, the EQF will promote the development of National Qualifications Frameworks (NQFs). Qualifications frameworks promote lifelong learning by, for example, making it easier for people to move between different types of education and training institution, for example between higher education and vocational education and training. As an instrument for the promotion of lifelong learning, the EQF encompasses general and adult education, vocational education and training, as well as higher education. It applies to all types of qualifications from those achieved at the end of compulsory education to those awarded at the highest level of academic and professional or vocational education and training.

1.3 United Kingdom National Actions to Implement Lifelong Learning in Europe: *the NVQ approach*

In the United Kingdom, as in Ireland and the Netherlands, there is strong acceptance of an output-oriented, performance-based model of education and training, e.g. learning outcomes. General acceptance of learning outside formal education and training institutions as a valid and important pathway to competences is a basic feature in these countries. What is questioned, however, is how such a system should be realised. The challenge of developing an acceptable qualification standard seems to represent the first and perhaps most serious obstacle. As long as assessments are supposed to be criterion-referenced, the quality of the standard is crucial. All three countries base their vocational education and training on modularised systems.

The stocktaking report issued as the London Communiqué of May 2007 shows that some elements of flexible learning exist in most countries, but a more systematic development of flexible learning paths to support lifelong learning is at an early stage. Only in a small number of EHEA countries could the recognition of prior learning for access and credits be said to be well developed. The United Kingdom is one of these countries.

The UK welcomes lifelong learning as an essential part of the Bologna Process. It views this form of learning as a way of increasing competitiveness, and as an instrument of social cohesion. The UK is adopting national frameworks for higher education qualifications that take account of lifelong learning such as vocational qualifications.

The Scottish Credit and Qualifications Framework (SCQF) and the Credit and Qualifications Framework for Wales (CQFW) support lifelong learning by incorporating all levels of education into single qualifications frameworks. The Scottish Executive (now Scottish Government) has also published a Lifelong Learning Strategy. The recent report (2005) of the Measuring and Recording Student Achievement Group, chaired by Professor Robert Burgess, recommends that a national credit system be developed in England in the interests of lifelong learning and as an instrument for developing qualifications frameworks.

Constructive developments within the Bruges-Copenhagen Process and the Bologna Process should complement, and not duplicate, one another. Efforts to include vocational education and training in a framework of qualifications for Europe are welcome although a proliferation of levels in such a framework would be undesirable. For up-to-date information on qualifications frameworks and the Bruges-Copenhagen Process please contact: info@europeunit.ac.uk.

1.3 ECTS – the European Credit Transfer and accumulation System – guarantees academic recognition of studies abroad. As well as in the Member States, the system has been widely adopted in the candidate countries. The majority of UK institutions participating in Socrates-Erasmus are familiar with the European Credit Transfer and accumulation System and it is anticipated that the use of ECTS will continue to be extended among UK institutions through continued participation in the Socrates-Erasmus programme.

2 Recent developments

At the 2003 Berlin summit Ministers called for qualifications frameworks to "*encompass the wide range of flexible learning paths, opportunities and techniques"* and to make appropriate use of the ECTS credits.

The European Commission's so-called Bruges-Copenhagen Process is working on enhanced European cooperation in vocational education and training (VET). The Bruges-Copenhagen Process is aiming to establish a credit system for VET and common reference levels. The European Union's

proposals for education and training programmes to replace the current Socrates programme include plans for an integrated framework geared towards lifelong learning.

As stated in the London Communique, May 2007, some initial progress has been made towards the implementation of national qualifications frameworks, but much more effort is required. "*We commit ourselves to fully implementing such national qualifications frameworks, certified against the overarching Framework for Qualifications of the EHEA, by 2010.*"

3 Scottish Credit and Qualifications Framework (SCQF)

3.1 Background and Context

The SCQF is the most developed credit and qualifications Framework in Europe and was formally launched in Scotland in December 2001, three months after the publication of *An Introduction to the Scottish Credit and Qualifications Framework* (SCQF, 2001). This described the formal structure of the Framework and stated that the general aims of the SCQF are to:

- assist people of all ages and circumstances to access appropriate education and training over their lifetime to fulfil their personal, social and economic potential
- enable employers, learners and the general public to understand the full range of Scottish qualifications, how they relate to each other and how different types of qualifications can contribute to improving the skills of the workforce.

The SCQF is also intended to provide a national vocabulary for describing learning opportunities and will:

- make the relationships between qualifications clearer
- clarify entry and exit points, and routes for progression
- maximise the opportunities for credit transfer
- assist learners to plan their progress and learning (SCQF, 2001, pp.1-2)

There are many different kinds of Scottish qualifications – Highers, Scottish Vocational Qualifications (SVQs), Higher National Diplomas (HNDs), Degrees and many more. The Scottish Credit and Qualifications Framework (SCQF) is Scotland's unified credit and qualifications Framework. The Framework gives each qualification SCQF Credits and a level to make it easier for you to compare one with another.

Looking at the different levels in the Framework is like looking at a road map. You can see where you are now and the different routes you can follow – like the different routes to learning – to reach your next destination. The Framework is also like a climbing frame, with the possibility of lots of horizontal as well as vertical routes to successful learning.

Table 1 shows how all the many different kinds of Scottish qualifications – Highers, Scottish Vocational Qualifications (SVQs), Higher National Diplomas (HNDs), Degrees compare with each other at different levels.

The SCQF is a comprehensive framework, and unlike many other qualification frameworks, it includes higher education and academic and vocational qualifications, and it aims to include informal learning. Compared with other comprehensive frameworks the SCQF is distinguished by the leading role the university sector has played in its development. It was developed in partnership by the Scottish Qualifications Authority, Universities Scotland, Quality Assurance Agency Scotland and the Scottish Government and was launched in December 2001. It uses two measures to describe qualifications and learning programmes: level and credit. There are 12 levels within the Framework which indicate the complexity of learning, and credit points which show the volume of learning undertaken to achieve the qualification.

The SCQF will also assist in making clear the relationships between Scottish qualifications and those in the rest of the UK, Europe and beyond, thereby clarifying opportunities for international progression routes and credit transfer.

3.2 Scope of the SCQF

The SCQF is an enabling, non-regulatory Framework that is designed to include all learning which is described in terms of learning outcomes, provided there is quality-assured assessment of learner achievement. Learning outcomes can be defined as "statements of what a learner is expected to know, understand and/or be able to do at the end of a period of learning". The Framework is now

successfully established in schools, colleges, universities and other places of learning throughout Scotland.

Several sectors are currently working to implement and develop the SCQF, including Health, Community Learning and Development and Social Care.

SCQF level	SQA National Units, Courses and Group Awards	Higher Education	Scottish Vocational Qualifications
12		Doctorates	
11		Masters	SVQ 5
10		Honours degree Graduate diploma	
9		Ordinary degree Graduate certificate	
8		Higher National Diploma Diploma in Higher Education	SVQ 4
7	Advanced Higher	Higher National Certificate Certificate in Higher Education	
6	Higher		SVQ 3
5	Intermediate 2 Credit Standard Grade		SVQ 2
4	Intermediate 1 General Standard Grade		SVQ 1
3	Access 3 Foundation Standard Grade		
2	Access 2		
1	Access 1		

Scottish Vocational Qualifications have been provisionally placed in the Framework and work is underway to formally allocate SCQF level and credit. This is being taken forward by the Scottish Qualifications Authority, working in partnership with other UK regulatory bodies, Sector Skills Council and Awarding Bodies.

Table 1 Scottish Vocational Qualifications in SCQF

3.3 SCQF Levels

The SCQF has **12 levels of outcome** which provide a basis for broad comparisons between learning and qualifications achieved in different contexts, and indicate how demanding a qualification or programme is – Level 1 being the least demanding and Level 12 the most demanding. At each level five headings have been identified to make the descriptors manageable. These are:

- the complexity and depth of knowledge and understanding – mainly subject-based;
- level of practice: applied knowledge and understanding in academic, vocational or professional practice;
- generic cognitive skills, e.g. evaluation, critical analysis
- communication, numeracy and IT skills;
- the level of autonomy, accountability and the role(s) taken in relation to other learners/workers in carrying out tasks, i.e. working with others.

The 12 levels of outcome and the 5 characteristics or descriptors of the SCQF (see Annex 2) compare favourably with the 8 levels and 3 descriptors of the European Qualifications Framework (EQF) (see Annex 1).

4 Lifelong Learning and Employability

4.1 Introduction

In the UK the role of lifelong learning is to support employability. The role of employability in higher education covers traditional academic skills, personal development skills such as ‘time

management and planning skills' critical thinking and analysis', self-confidence', decision-making' and problem-solving', and enterprise or business skills such as 'organisation and planning'. However, the concept of employability skills for the student in the classroom is often somewhat abstract and relates to a future beyond higher education. In a study titled "Enhancing student awareness of employability skills through the use of progress files", Leggott, D. and Stapleford, J. (2004) that took place over five years involving 35 undergraduate students, it was found that students had a low awareness of the skills that they are developing at university and many of them were unaware of the skills requirements of employers.

4.2 Personal Development Plans (PDPs) for Progress Files

As a result of these findings, Personal Development Plans (PDPs) for Progress Files have been used to bridge the gap between the students' perceptions of their skills development and the skills requirements of 21st century employers. It is hoped that the experience gained from the use of PDPs will contribute towards the enhancement of the quality of students' higher education experience and their preparation for life beyond university.

4.3 Employability

In order to make students more aware of what employers expect, the UK Government has advised HEIs to set up Employability Offices and Officers. Employability Officers work together with the students and the University to find ways of improving students' skills development (particularly employability skills) within their programme of study and increasing their awareness of these by evaluating the current skills element, incorporating new skills into the course curricula as appropriate and making all skills more evident in the curriculum and course documentation.

The main aims of the Employability Office are to increase the employability of students, to equip them with career management skills and to encourage and support academic staff in embedding employability and career development learning in the curriculum. Since 2005 nearly all UK universities have established Employability Offices, supported by a number of external drivers and quality assurance mechanisms, such as the QAA Code of Practice and the introduction of Progress Files in HE. These drivers have provided direction for the work of the Employability Office. For example, in order to identify gaps in the provision and areas for improvement on programmes of study, an audit of employability skills provision in the existing curriculum can be performed. Personal development planning (PDP) within the Progress Files agenda provides an excellent framework for embedding the missing aspects into the curriculum.

In order to be helpful, a QAA working party was asked to devise a set of Focussed Learner Questions (FLQs) to assist staff in HEIs implement PDP. The working party established a set of criteria and constructed a set of examples. These follow.

The QAA working party laid down the following criteria

- The FLQs should be flexible enough so that institutions/providers should be able to integrate these with their own programmes: such FLQs may increase in complexity throughout a degree programme.
- FLQs should be open questions, framed in a positive manner that will encourage the student to explore and open up their learning experiences.
- FLQs should be clearly linked to the intended learning outcomes of a programme of study
- The FLQs should be designed so that outcomes can be demonstrated and recorded
- The outcomes of FLQs may be recorded using diaries and learning logs
- The effectiveness of FLQs as a focus for student learning should be evaluated by institutions

Examples

- **Academic Awareness (or experience)**
  - What do I want to achieve at University?
  - What do I need to know?
  - What do I know?
  - How does what I have learnt relate to what I already know?

  - What are the gaps in my knowledge?
  - How will I demonstrate I have achieved the learning outcomes?
  - What else do I need to do to learn more effectively?
  - How do I learn (best?)
- **Personal Awareness (or experience)**
  - Who am I?
  - What do I value/not value?
  - What do I like/not like?
  - What am I good/not good at?
  - What skills do I have/not have?
  - How can I get better at…….?
- **Career Development Awareness (or experience)**
  - How do I find out what I want to be?
  - What do I want to be?
  - What do I need to do to be a …….?
  - How will my chosen course help me to be a ……?
  - What do I want to achieve at University?
  - What skills/values do I have that will help me to be an……..?
  - What skills/values do I need to be an ……..?
  - How and where can I develop skills I might need but are presently lacking?

4.4 SFIA Framework and Employability

In order to make students more aware of what employers expect in terms of employability skills in the ICT sector, the Skills Framework for the Information Age (SFIA) is being used as one of the main drivers.

First published in 1999 as the National Information System Skills Framework, SFIA has evolved to become the industry standard for IT skills management. It is cited as the *high level UK Government backed competency framework describing the roles within IT* and, more importantly, the skills needed to fulfil them. SFIA gives employers a framework which they can use to measure the skills they have against the skills they need, and tells education and training providers what the job market wants. It is supported by four key organisations as follows:

- BCS – British Computer Society
- e-skills UK – Sector Skills Council for IT and Telecoms
- IET –Institution of Engineering and Technology
- IMIS – Institute for the Management of Information Systems

BCS in conjunction with SFIA offer a skills matrix, called **SFIAplus, (SFIAplus, 2008)** which contains the framework of IT skills **plus** detailed training and development resources (previously called the Industry Structure Model). It provides the *most established and widely adopted IT skills, training and development model reflecting current industry needs*.

The BCS and IET accredit degree programmes for professional recognition using a number of criteria such as **SFIAplus** as well as academic curriculum content.

SFIAplus can be viewed as a three-dimensional model which consists of categories of work (comprising 78 specific skills), levels of responsibility and some task components – see Figure 1.

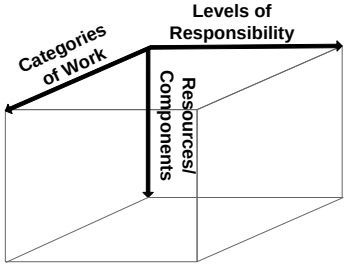

Figure 1: SFIAplus model

The dimensions of the model are formulated according to:

1. SIX main Categories of Work
    - Strategy and Planning
    - Development
    - Business Change
    - Service Provision
    - Procurement and Management Support
    - Ancillary Skills
2. SEVEN Levels of Responsibility
    - Follow
    - Assist
    - Apply
    - Enable
    - Ensure, Advise
    - Initiate, Influence
    - Set Strategy, Inspire, Mobilise
3. SIX Task Components
    - Background
    - Work Activities
    - Knowledge and Skills
    - Training Activities
    - Professional Development Activities
    - Qualifications

SFIAplus can be used to identify and benchmark skills to the industry standard; map current skills within an IT job role; identify career paths; plan training and development activities, achieving BCS Professional Development Accreditation. It also forms the basis of a range of online browser-based professional development products and services for both individuals and employers [6].

Through support provided by the Higher Education Innovation Fund (HEIF), Southampton Solent University (SSU) is engaging in a range of knowledge transfer activities with business and community partners. As part of this initiative, its Faculty of Technology is developing an undergraduate course in Knowledge Management (KM), building on existing strengths while addressing industry requirements. Employability skills are the emphasis of this paper in the context of the KM course curriculum. The role of employability in higher education covers traditional academic skills, personal development skills, and enterprise or business skills [1]. However, the concept of employability skills for the student in the classroom is often somewhat abstract and relates to a future beyond higher education. It has been found that students have a low level of awareness of skills they are developing at university [2,4]. In order to make students more aware of what employers expect, employability skills are identified and integrated in the new course. The Skills Framework for the Information Age (SFIA) [5] is being used as one of the main drivers for this in the KM course development.

The KM course proposed at SSU aims to develop problem solving, communications, teamwork and the specific skills needed by the emerging information management technologies. Moreover, the programme is *designed to meet employers' need for innovative expertise and students' needs for an engaging, developmental and interesting course of study, leading ultimately to rewarding employment*. There is not a universal and standardised skills framework, so SFIAplus has been chosen as the reference against which employability skills are mapped. A novel presentation of the SFIA framework is given in Figures 2 (a) and (b) within the context of Knowledge Management – all of the 78 skills are displayed across six categories – however, the ones which are not considered relevant to KM are shown in grey.

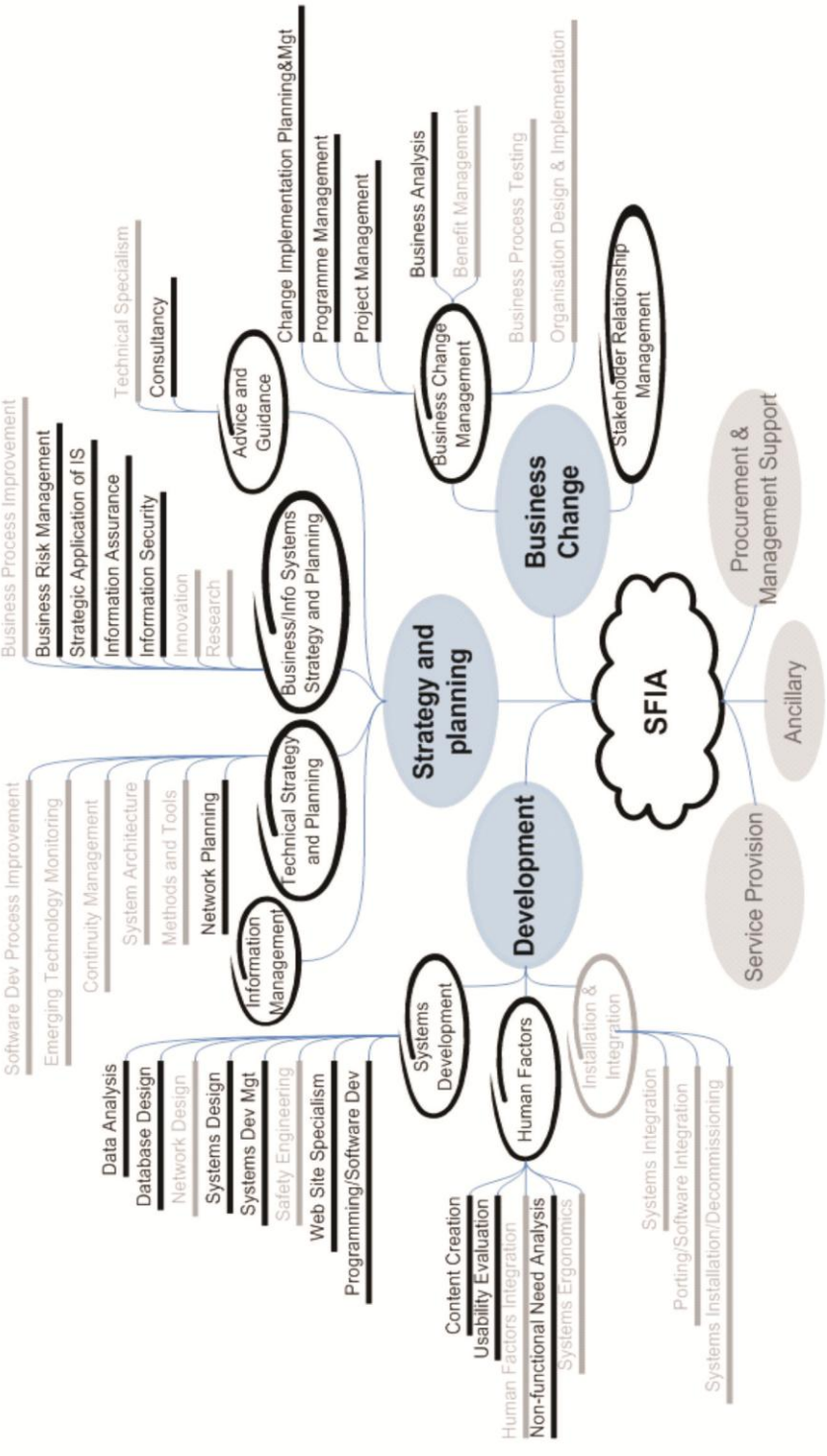

Figure 2 (a): SFIA framework in the context of KM – Part 1 Reproduced by kind permission of Jing.Lu@solent.ac.uk

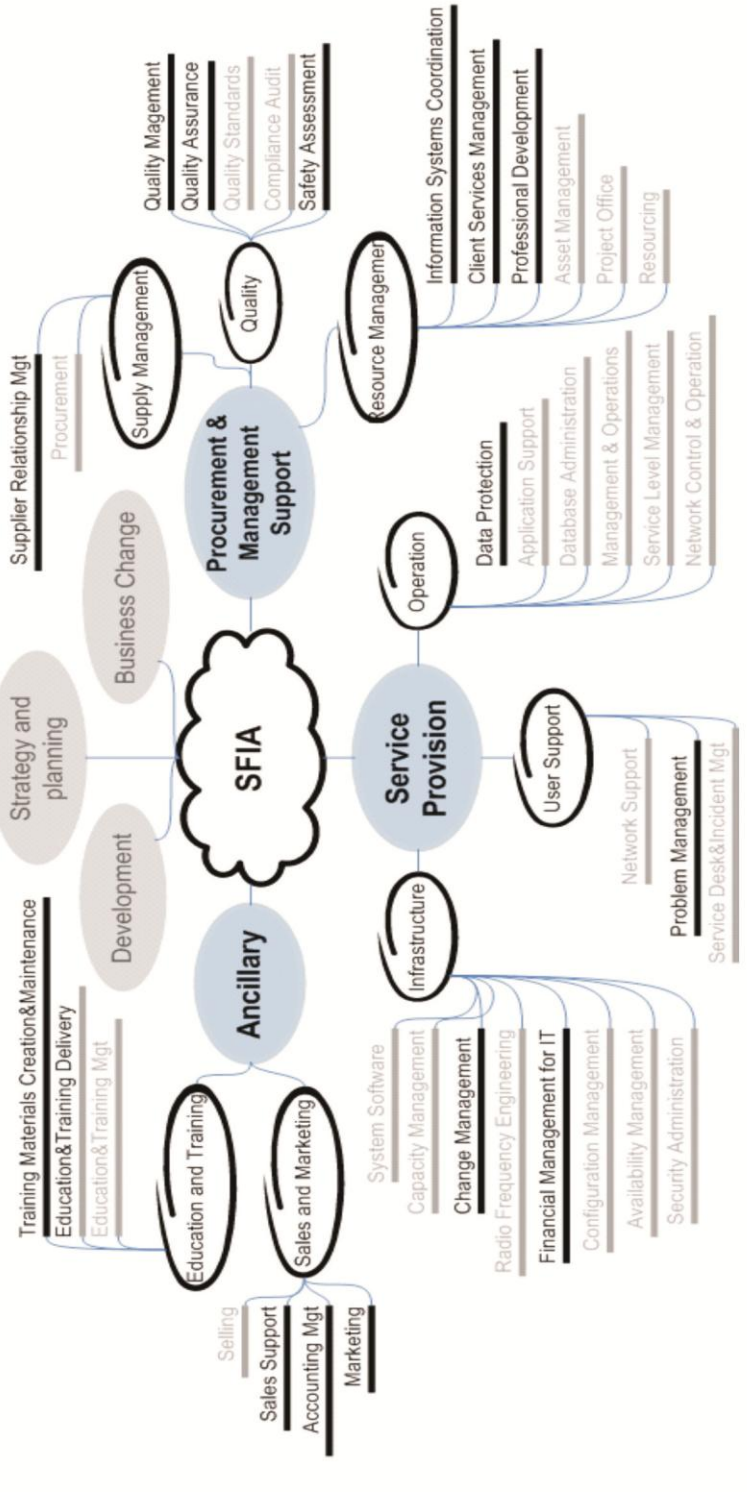

Figure 2 (b): SFIA framework in the context of KM – Part 2 Reproduced by kind permission of Jing.Lu@solent.ac.uk

4.4.1 Knowledge Management Skills Map

Following the approach of TFPL/KnowledgeRecruit [10], a KM skills map is shown in Figure 3 drawing from Figure 2 above. 37 skills have been selected from the SFIA framework with the six categories of skills indicated graphically using a weighting scale for KM.

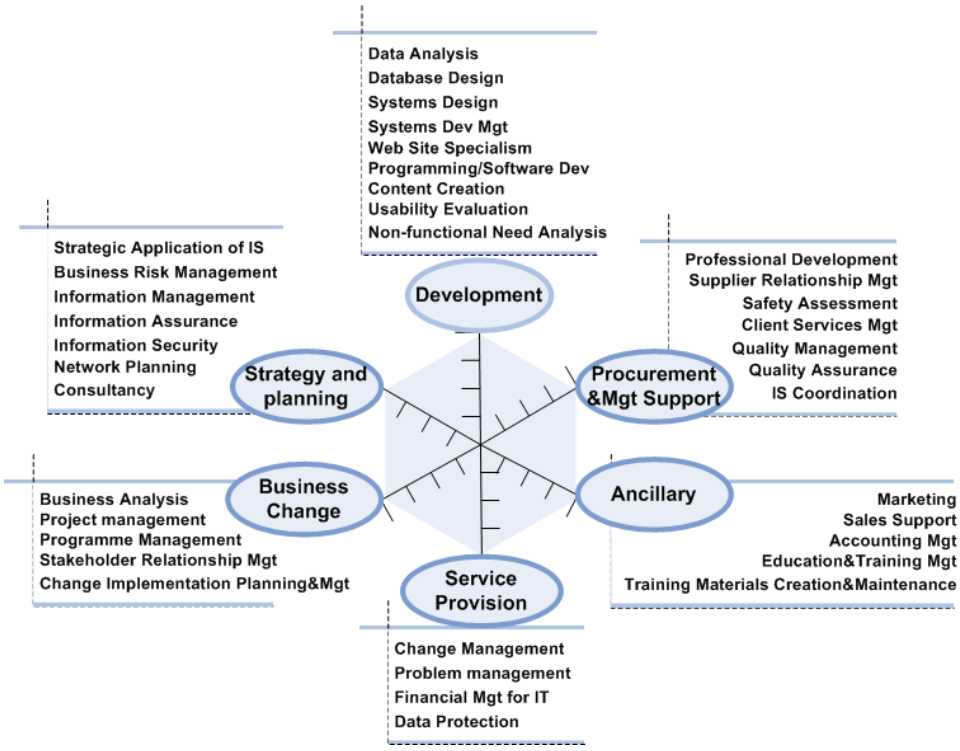

Figure 3: Knowledge Management skills map

Using KM skills maps to present the employability skills is seen as helpful both for the students and the new course delivery. The course will be organised in part by dividing material into small units and then repacking them for teaching alongside selected activities, such that it is easier for staff to deliver material and it is flexible for students to engage in learning. Some activities tend to the technology side and others to business. The details of suggested activities will not be covered in this paper; however, two sample activities are given here to explain how they can be represented and distinguished via KM skills maps. For example:

Activity 1: Create a prediction model of consumer behaviour in a given area using artificial neural networks for clustering and Bayesian belief networks for forecasting.

Activity 2: Present one set of information "perfectly".

Each individual activity will focus on a different set of skills. For example, students are expected to achieve the following knowledge, understanding and skills at the completion of their study for Activity 1 above:

- Make appropriate use of data management technologies (data acquisition, processing, administration, retrieval or mining) to analyse the data from certain application areas.
- Apply the basic concepts and principles of artificial neural networks and Bayesian belief networks; make appropriate use of tools in the creation of predictive models.
- Describe, explain and evaluate the models to assist in the analysis of consumer behaviour.

Activity 2 emphasises the development of skills relating to the presentation of the various forms of information. It aims to "present the right information in the right way to the right audience". It also provides a holistic understanding of the role and function of information together with its representation and delivery. Various techniques and methods will be viewed as devices for "perfectly" presenting information.

The KM skills maps for the above two activities are given in Figures 4 (a) and (b), where skills which are not considered to be achieved by the activity are again shown in grey.

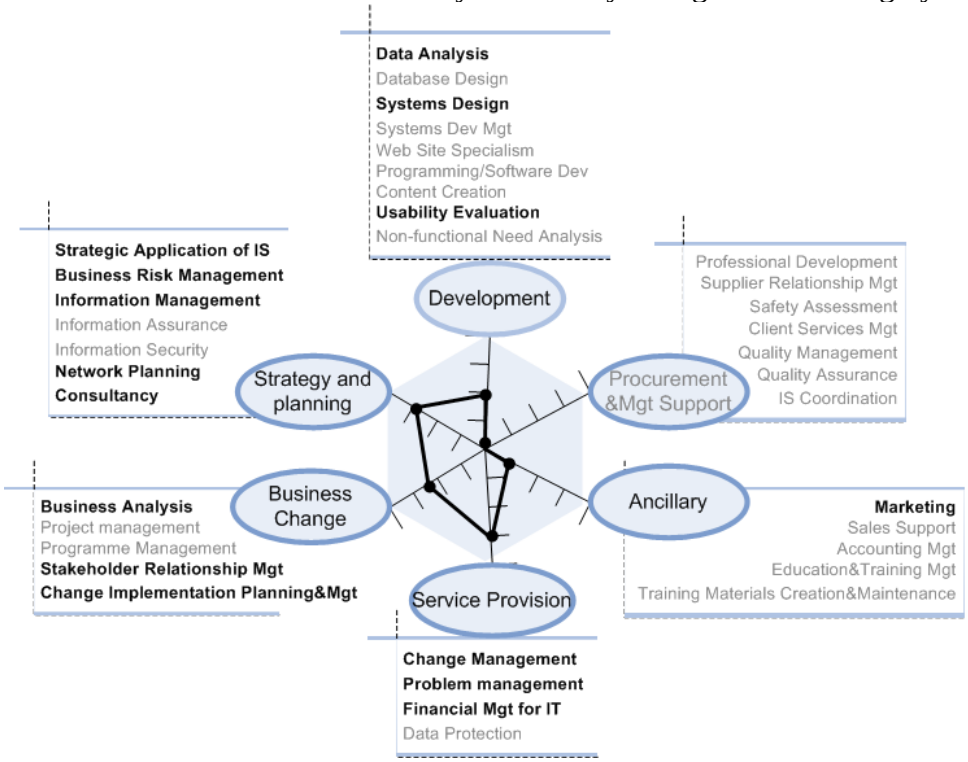

Figure 4 (a): KM skills map for Prediction Model (Activity 1)

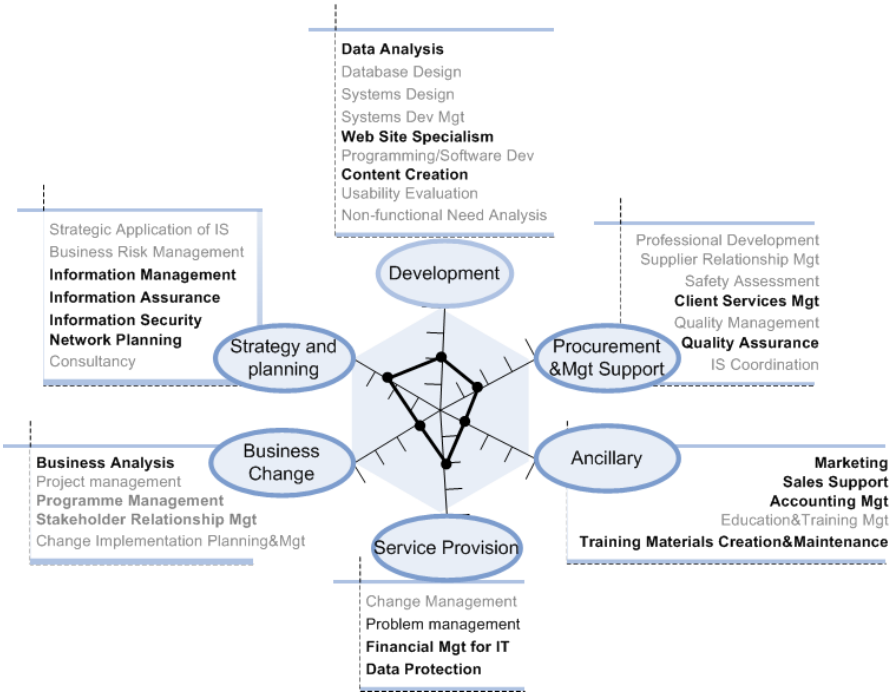

Figure 4 (b): KM skills map for Presenting Information" Perfectly" (Activity 2)

4.4.2 Integrating Employability Skills in the KM Course

The KM course is new and different from traditional course structures in various ways, such as:

- Activity-based: as mentioned in section 3, the new KM course builds on activities which focus on different aspects of knowledge management. Up to four activities are proposed each year and they are open to all three levels of students. Therefore, the areas of study, learning outcomes and assessments are all designed for three different levels.

- Compatible with the current units: aside from the activities, there are many existing course units which students could choose from. The new KM course takes advantage of units within the School (Computing and Communications), the Faculty (of Technology) and even across the University. Furthermore, some additional learning (such as specific lectures, laboratory practicals or group work) will be recommended for students to take, depending on the particular activity.

Figure 5 shows the proposed structure of this KM course. The dotted box in the middle represents the elements of the KM course – consisting of activities, course units and also some additional learning at the bottom – employability skills are outcomes at the top. The students gain these skills both through the activities as well as the current units.

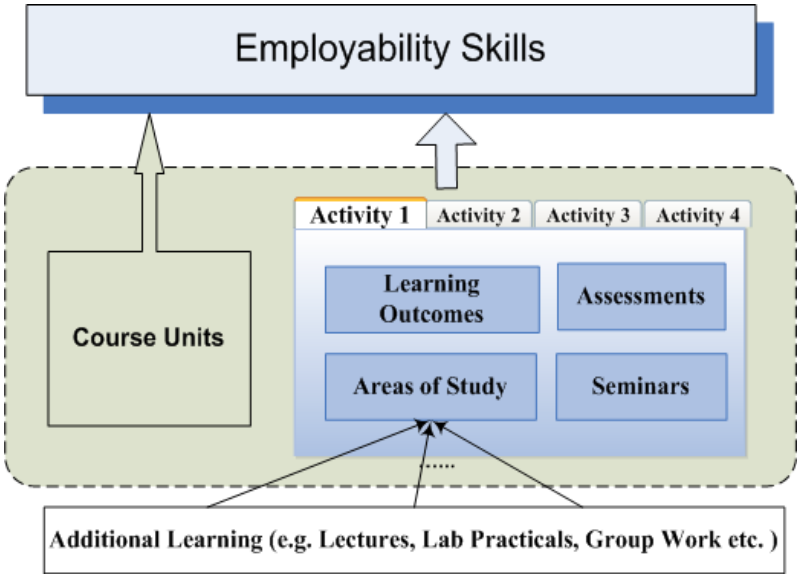

Figure 5: KM course structure

Some features of integrating employability skills in the KM course are:

- The categories and range of skills to be developed are clearly established (based on the SFIA framework)
- The employability skills are linked to a specific KM activity in the form of a KM skills map
- Skills maps will be made available to students at an early stage of their learning, raising awareness of which skills they are expected to gain
- Skills will be related directly through the whole process of each activity

As mentioned early in section 2, the SFIAplus model also includes another two dimensions, i.e. Levels of Responsibility and Resources/Components (see Figure 1). Some of the factors within these dimensions could potentially be integrated in the design of individual KM activities and the course development strategy will be considering this.

4.5 Employability at GCU: The Real WoRLD Project

Work-related skills for employability

Real WoRLD stands for 'Realising Work-Related Learning Diffusion'. Work-related learning is a key component of Glasgow Caledonian University's Teaching, Learning and

Assessment Strategy. One of its strategic goals is to build students' competencies in the skills demanded by employers in a knowledge economy.

The project aims to raise the profile of employability across the university through encouraging all schools to embed work-related learning activities into their programmes, use innovative approaches in learning and teaching to enhance their students' professional skills and engage with employers on a regular basis.

Work-related learning is a key component of Glasgow Caledonian University's (GCU) Teaching, Learning and Assessment Strategy[1]. A strategic goal is to "build students' competencies in the skills demanded by employers in a knowledge economy".

The importance of bringing the worlds of work and learning closer has been increasingly emphasised at policy level in Scotland (The Scottish Government, 2007[2]; SFC, 2005[3]), in the UK (Leitch, 2006[4]) and within the EU (Lisbon Strategy[5]; Bologna Agreement[6]). The Scottish government, for example, have emphasised that universities need to "provide high quality, relevant, learning opportunities that have value in the workplace"; "emphasise and prioritise employability as a key outcome from learning"; "ensure that in teaching individuals they provide them with essential skills"; and "work closely with business to develop courses that will lead to individuals having the knowledge and skills that meet both business need and individual aspirations" (The Scottish Government, 2007, p.48). In addition, Scottish Founding Council (SFC, 2005) emphasised that employability will have to be tackled at various levels, including:

- Curriculum-design level ("what to learn") – i.e. introduction of appropriate courses and programmes to enhance employability
- Course-design level ("how to learn") – i.e. improvements in pedagogic approaches, teaching methods, design of learning activities, learning resources, and assessment methods to enhance employability.
- Acquisition of work-related experience (eg work placements, internships, voluntary work) and enterprise-related experience (entrepreneurship) outside classroom
- Career education and guidance (eg job seeking skills, CV writing skills, performing at a job interview).

However, significant gaps in these areas have been identified. The Leitch report (2006) outlining the UK requirements for development of competencies in the workforce argues that the UK is failing to equip learners with skills necessary to retain the country's competitiveness in the global economy. The same concerns have routinely been raised in other EU countries. The missing skills range from basic ones of textual and digital literacy and numeracy to 'innovation skills' such as creativity, problem-solving, collaboration and resourcefulness. In a knowledge economy, the key behaviours that future workers will have to exhibit are those of knowledge worker (Straub, 2007[7]):

- Autonomy and self-management
- Ability to take control of one's own knowledge as a key means of production
- Acquiring deep and interactional expertise

[1] Draft document is currently under discussion.

[2] The Scottish Government (2007). Skills for Scotland: A lifelong learning strategy. Edinburgh, UK: The Scottish Government. ISBN 978-0-7559-5479-7

[3] SFC, Scottish Funding Councils for Further and Higher Education (2005). Learning to Work: Enhancing employability and enterprise in Scottish further and higher education. Retrieved November 08, 2007, from http://www.sfc.ac.uk/publications/pubs_other_sfefcarchive/learning_to_work.pdf

[4] Leitch, S. (2006). Prosperity for all in the global economy: World class skills. http://www.hm-treasury.gov.uk/media/523/43/leitch_finalreport051206.pdf

[5] EU Lisbon Strategy, see summary at http://europa.eu/scadplus/glossary/lisbon_strategy_en.htm; for more details see http://en.wikipedia.org/wiki/Lisbon_Strategy

[6] The Bologna Declaration: Joint declaration of the European ministers of education. http://www.bologna-bergen2005.no/Docs/00-Main_doc/990719BOLOGNA_DECLARATION.PDF

[7] Straub, R. (2007). Towards the Perfect Storm. Keynote presentation at Corporate Learning 2007 Conference. Available at https://sas.elluminate.com/site/external/jwsdetect/playback.jnlp?psid=2007-11-16.0558.M.6B106916CEB2103F99982229D59B27.vcr

- Ability to set one's own objectives and goals and to flexibly adapt those to workplace needs
- Ability to function effectively in non-hierarchical, loosely structured working environments
- Ability to develop and maintain strong networks with and affinity to peers and peer communities
- Ability to collaborate productively within culturally diverse and geographically distributed teams

With half-life of knowledge drastically decreasing (Siemens, 2006[8]), in many disciplines the knowledge that students acquire in their first year will be outdated by the time they graduate. Therefore, learning to learn and adapt rather than only mastering a set body of information or competencies is one of the most important skill that universities should help students to acquire.

Various commentators have suggested that Universities are not keeping pace with these demands (Moreland, n.d.[9]; Reynolds, Caley and Mason, 2001[10]). Organisations facing widening knowledge and skills gaps are raising concerns about the competencies of the workforce. For example, a recent global human capital study of more than 400 organisations from 40 countries (IBM, 2007[11]) highlighted a range of workforce issues, including:

- Lack of leadership capability in employees
- Employees unable to collaborate and share knowledge across the organisation
- Employee skills not aligned with current organisational priorities
- Inability to rapidly develop employee skills to address current/future business needs

Educational institutions are failing to adequately prepare students for the modern workplace. To bridge the growing gap between competencies for work and those acquired during university study, the worlds of education and work must be integrated more closely. Most studies have examined such work-related learning primarily at the macro-level (policy) and meso-level (curriculum) (HEA, n.d.[12]). The micro level –pedagogic approaches, teaching methods, course design principles, design of learning activities and assessment – has largely been neglected.

There has also been extensive focus on career advice. Activities in this area largely aim to prepare students for their first job. This approach has enabled Universities to achieve relatively easily against the performance indicators upon which they are typically assessed. These indicators focus on short-term measures such as the percentage of graduates in employment within six months of completing their study. These simplistic parameters may be easy to measure, but they are not helping to address the longer-term, strategic concerns of countries and nations, nor have they encouraged Universities to tackle the more difficult issues of knowledge, behaviours, and capabilities for lifelong employability. Knowledge, skills and capabilities for effective functioning in the knowledge economy should be developed throughout the entire curriculum and individual courses, rather than in a piecemeal, modular and decontextualised way.

Integration of work and learning requires addressing all three levels of policy, curriculum, pedagogy, as well as career development and job seeking skills at the same time. At macro-level, an institutional strategy of work–related learning is required. At meso-level, curriculum improvements are required that will help students develop the capabilities to function effectively in the workplace. At micro-level, new pedagogic approaches are needed that lay the foundations for lifelong learning and bridge the worlds of work and education, allowing students to engage in the culture of their

[8] Siemens, G. (2006). Knowing knowledge. Available online at http://www.knowingknowledge.com/book.php
[9] Moreland, N. (n.d.). Work-related learning in Higher Education. HEA Learning and Employability Series 2, http://www.heacademy.ac.uk/embedded_object.asp?id=21953&prompt=yes&filename=EMP051
[10] Reynolds, J., Caley, L., & Mason, R. (2001). How do people learn? Research report, Chartered Institute of Personnel Development. Cambridge, UK: University of Cambridge.
[11] IBM (2007). Unlocking the DNA of the adaptable workforce: Global human capital study 2008. Available online at http://www-935.ibm.com/services/us/gbs/bus/html/2008ghcs.html
[12] HEA (n.d.), Learning and Employability Series (various studies). http://www.heacademy.ac.uk/learningandemployability.htm

prospective professions and learn by solving real-world problems using workplace oriented resources and collaborating with others as they would do in a real-world workplace.

The **Real**ising **Wo**rk-**R**elated **L**earning **D**iffusion (RealWoRLD) initiative aims to address all three levels. It will be founded upon a four-tier framework[13]:

- *Problems* and issues associated with work-related learning at GCU
- *Principles* underpinning effective work-related learning as solutions and drivers
- *Practice* exemplars of work-related learning from across the GCU as well as other institutions nationally and internationally
- *Platform* to share practice in work-related learning.

This framework was developed and successfully applied at Shell Exploration and Production in the Netherlands in 2002-2005, to support implementation of their new learning strategy (Margaryan, 2006[14]). The Shell study specifically examined ways in which innovative practice in work-based blended learning could be disseminated and implemented across an organisation to address the key strategic goals of integration of work and learning and improved knowledge sharing. RealWoRLD will build upon the outcomes of the Shell project. Although the Shell study was carried out within a corporate learning context, the framework is sufficiently generic to be applied in a higher education setting.

RealWorld will draw upon a set of 11 principles underpinning effective work-related learning, which were abstracted through an extensive literature review of contemporary learning theories and educational design approaches (Margaryan, 2006). The principles determine that *work-related learning is effective when*:

1. Learners are engaged in solving real-world problems through authentic activities[15].
2. Authentic activities enable activation of learners' existing knowledge and skills as a foundation for new knowledge and skills.
3. Authentic activities provide for modelling and demonstration of new knowledge and skills to learner by instructor and relevant workplace experts.
4. Authentic activities engage learners in applying new knowledge and skills in practice, at the same time when such new knowledge and skills are being acquired.
5. Authentic activities enable learners to integrate new knowledge and skills into practice.
6. Authentic activities provide opportunities for learners to learn from others – learners, instructor, workplace experts and peers, workplace supervisor and coach, and other individuals with relevant expertise.
7. Authentic activities provide for direct involvement of learners' workplace supervisor or other expert(s) nominated by him/her in the course.
8. Authentic activities are supported by learning resources reused from the outcomes of work-based activities contributed by learners, from learner's workplace, and from elsewhere in organisation, sourced through knowledge-sharing repositories.
9. Authentic activities are carried out collaboratively, in diverse teams.
10. Authentic activities enable differentiation and accommodation of the diverse needs of learners.
11. Electronic tools and environments are used to support work-related learning. These tools must provide *consistent* accessibility, sourcing, archiving and sharing of learning resources and learning supports for as well as *interaction* and *communication* around learning activities.

[13] This framework underpins a range of other CA strategic initiatives, such as Progression and Retention Project.

[14] Margaryan, A. (2006). Work-based learning: A blend of pedagogy and technology. Enschede, The Netherlands: Ipskamp. Available from http://www.academy.gcal.ac.uk/anoush/fulltexts/margaryan-dissertation.pdf

[15] Authentic activities are defined as learning tasks that "match as nearly as possible the real-world tasks of professionals in practice in a given discipline; problems inherent in the activities are ill-defined and open to multiple interpretations rather than easily solved by the application of existing algorithms". For details see Reeves, T.C., Herrington, J., & Oliver, R. (2002). Authentic activities and online learning. Retrieved December 11, 2007, from http://elrond.scam.ecu.edu.au/oliver/2002/Reeves.pdf

These principles have been found to have the following three properties (Merrill, 2002[16]; Margaryan, 2006 – see footnote 14):

- Learning from a given programme will be promoted in direct proportion to its implementation of the principles of work-related learning
- The principles can be implemented in any delivery system or using any pedagogic architecture.
- The principles are prescriptive rather than descriptive. They relate to creating effective work-related learning environments rather than describing how learners acquire knowledge and skills.

Therefore, these principles are a suitable overall basis for the RealWorld project. They will be contextualised as needed to guide specific developments within GCU Schools.

News:

1. Sabine McKinnon is currently collaborating with academic, and support colleagues, students and employers to coordinate the many examples of best practice taking place across our Academic schools at Glasgow Caledonian University.

Aims and Objectives

The RealWoRLD initiative aims to integrate the world of employment and higher education by addressing employability at three levels:

- at **institutional** level through developing a coordinated, sustainable strategy for work-related learning
- at **programme** level through implementing curriculum improvements that will help students develop the capabilities to function effectively in the workplace
- at **pedagogic** level through developing innovative approaches to teaching, learning and assessment.

The project team will work in close collaboration with staff in academic and support departments, Heads of Learning, Teaching and Quality, Programme Boards, student and employer representatives.

5. Conclusions

The UK, with a number of well established national credit and qualifications frameworks for higher education, such as the Framework for Higher Education Qualifications in England, Wales and Northern Ireland, and the SCQF in Scotland, has qualification descriptors designed to meet the "easily readable and comparable" criterion in the Bologna Declaration. Please refer to annexes 1 and 2 for comparison and equivalence of credit and qualifications frameworks between the UK and European qualifications frameworks and Annex 3 for comparison and equivalence of UK and some European grading or making schemes.

The UK also has a set of established support systems for lifelong learning and employability. In addition to the SCQF taking account of SVQs for employability, there are PDPs, Progress Files and Employability Offices.

The London Communiqué of May 2007 asked the Bologna Follow-up Group (BFUG) to arrange for the ENIC/NARIC networks to analyse our national action plans and to spread good practice. The stocktaking report from London 2007 shows that some elements of flexible learning exist in most countries, but a more systematic development of flexible learning paths to support lifelong learning is at an early stage. We therefore ask BFUG to increase the sharing of good practice and to work towards a common understanding of the role of higher education in lifelong learning. Only in a small number of EHEA countries could the recognition of prior learning for access and credits be said to be well developed. Working in cooperation with ENIC/NARIC, we invite BFUG to develop proposals for improving the recognition of prior learning.

The next meeting on the Bologna Process is hosted by the Benelux countries in Leuven/Louvainla-Neuve on 28-29 April 2009.

[16] Merrill, D. (2002). First principles of instruction. Educational Technology Research and Development, 50(3), 43-59.

On top of the world: Glasgow Caledonian University is rated UK's best international student experience 25/02/2008

A measure of how well the UK is good at attracting overseas students is shown by Glasgow Caledonian University's international students rating their student experience second best in the whole world. Glasgow Caledonian University was ranked second worldwide within a field of 84 institutions which included Glasgow, Edinburgh, Oxford, Cambridge, Imperial, Queens University Belfast and Yale. The latest (autumn 2007) International Student Barometer (ISB) survey, carried out by independent research specialists i-graduate.org, measures international students' satisfaction with every aspect of their university experience.

Glasgow Caledonian was rated top in Scotland in every category: learning, living, support and arrival, and was rated significantly better than the Scotland, UK, and worldwide averages in every category.

Professor Graham Galbraith, the university's Pro Vice-Chancellor (International) said: "This is an outstanding result. We had some excellent feedback on university and campus facilities, and most importantly on the quality of our people, courses, teaching and research.

"Internationalisation and widening access are central to our mission, so it's essential that all students feel welcome and supported and are exposed to diversity in a way that prepares them for the global market place. Our staff work hard to deliver a great student experience and it is encouraging that investments in our award winning Saltire Centre, multi-faith provision and student support services are having a positive impact. We are delighted with this result and really value the feedback of our students which will help us to continue to improve the Glasgow Caledonian student experience"

The survey found that employability, work experience and careers advice are more important to international students at Glasgow Caledonian than to international students in other higher education institutions, and rate the university highly in each of these areas.

Redfern [3] pointed out that employability skills are best achieved not at the macro-level across whole degree courses, but at the micro-level where employability is linked to a specific teaching and learning activity. One means by which this can be achieved is by providing them with an outline of the skills that a learning activity involves – a profile of the activity's relationship to employment.

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8. SFIA: IET, http://www.theiet.org/careers/cpd/competences/, last accessed 30 January 2008.
9. SFIA: IMIS, http://www.imis.org.uk/about/sfia, last accessed 30 January 2008.
10. Skills for Knowledge Management: Building a Knowledge Economy, Angela Abell and Sandra Ward, TFPL Ltd/ISBN: 1870889843.

ANNEX I

Descriptors defining levels in the European Qualifications Framework

Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications.			
	Knowledge	Skills	Competence
	In the EQF, knowledge is described as theoretical and/or factual.	*In the EQF, skills are described as cognitive (use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).*	*In the EQF, competence is described in terms of responsibility and autonomy.*
Level 1 The learning outcomes relevant to Level 1 are	basic general knowledge	basic skills required to carry out simple tasks	work or study under direct supervision in a structured context
Level 2 The learning outcomes relevant to Level 2 are	basic factual knowledge of a field of work or study	basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	work or study under supervision with some autonomy
Level 3 The learning outcomes relevant to Level 3 are	knowledge of facts, principles, processes and general concepts, in a field of work or study.	a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	take responsibility for completion of tasks in work or study adapt own behaviour to circumstances in solving problems
Level 4 The learning outcomes relevant to Level 4 are	factual and theoretical knowledge in broad contexts within a field of work or study	a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities
Level 5* The learning outcomes relevant to Level 5 are	comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	exercise management and supervision in contexts of work or study activities where there is unpredictable change review and develop performance of self and others
Level 6** The learning outcomes relevant to Level 6 are	advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts take responsibility for managing professional development of individuals and groups
Level 7*** The learning outcomes relevant to Level 7 are	highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking critical awareness of knowledge issues in a field and at the interface between different fields	specialsed problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
Level 8**** The learning outcomes relevant to Level 8 are	knowledge at the most advanced frontier of a field of work or study and at the interface between fields	the most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research.

Compatibility with the Framework for Qualifications of the European Higher Education Area