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center of accreditation and quality assurance
of the swiss universities



ECA international conference on Learning Outcomes

„Defining and measuring learning outcomes in higher education“

3-4 September 2007, Zurich

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1 Introduction

1.1 Welcome words by Regine Aepli

Governor for Canton Zurich in charge of the Education Department and Vice-President of the Swiss University Conference, Switzerland

The Swiss University Conference sees the ECA initiative for a conference on learning outcomes as very useful since the definition and the use of learning outcomes is not easy to make.

The main action lines of the Swiss Bologna Reform are as follows:

- Adoption of a two cycle system (Ba-Ma)
- Introduction of ECTS
- Establishment of an external QA system
- Promotion of doctoral studies
- 2006 implementation of national minimal standards for internal QA at universities

2012: New law for the higher education sector.

In the last years 10% increase of students at Swiss higher education institutions. With this growing of numbers the quality of teaching and learning must be a major issue for the politics and for higher education institutions.

1.2 Welcome words by Hans Weder,

Rector of the University of Zurich and President of the Swiss Rector's Conference, Switzerland

Usability or usefulness?

Universities are thought by the society to promote growth and innovations. But is this really their "raison d'être"? Far too much is expected from the universities. They are only one part in the process of producing economic growth.

One has to bear in mind the notion of autonomy, science and scholarship. Science has its own demands, objectives defined from outside cannot be accepted by the universities.

Usable knowledge: finding answers to questions asked by the society. Usefulness: Bring back the attention to the questions themselves. Knowledge is usable when it enables people to solve problems of our present.

Pleading for: More useful and less usable outcomes of research.

1.3 Presentation by Peter Ewell

National Center for HE management systems

Creating Authentic Academic Cultures of Evidence

The concept of student learning outcomes has experienced growing prominence as a way to both organize the provision of higher education and to assess its quality. Proponents claim that constructing and assessing clear statements of student competency are critical in

improving teaching and learning. But many academics worry that excessive use of outcomes approaches will trivialize the academic enterprise. This keynote sets the stage for this discussion by examining the concept's promises and pitfalls.

There are different attributes of a meaningful culture of evidence for learning outcomes:

- shared recognition that many (but not all) things are knowable
- a comprehensive framework for thinking about learning outcomes
- an accessible store of information about student learning and what produces it
- an attitude toward problem-solving that minimizes “finger-pointing” at institutions and individuals
- clear follow-through on decisions made and the evidence used to make them
- willingness to stop doing things when they don't work

Advantages of learning outcomes approach

- Clarity of goals and objectives
- Flexibility across different modes of provision
- Allows comparisons of performance across populations, treatments and settings
- Supports establishment of portable credentials across institutions and jurisdictions

There are many advantages but it is very difficult to come to a definition of learning outcomes (conceptual and operational).

Pitfalls of a learning outcomes approach:

- Definitions of outcomes: extremely different (conceptual and operational): definitions have only meaning in this defined „area“. Statement of learning outcomes just words, they don't mean nothing
- Lack of legitimacy among traditional academics
- Fractionation: losing a sense of the whole with respect to complex abilities
- Loss of serendipity because not all important outcomes may be specifiable in advance

Challenges and stakeholder reactions to outcomes-based approaches

- Unclear motives
- Philosophical objections
- Implementation challenges in building a culture of evidence
- Implementation challenges are particularly associated with outcome approach

Strategies for dealing with unclear motives

- Consciously delimit the initiative
- Involve stakeholders early and often (done in small groups...)
- Take an incremental approach (do a few things, pick of the easiest things like mathematics, engineering)
- Adopt a consciously experimental approach
- Limit consequences

Discussion:

Institutions need a long time to implement culture of evidence – more than 5-6 years. And if they don't pay attention to socialise it by convincing faculty members all the time it will be lost.

Another challenge is how to find good experts who are ready to deal with the learning outcomes approach – this also needs time but conferences like the present one will help to resolve this issue.

(see as well the published corresponding presentation – Power Point document)

1.4 Presentation by Sjur Bergan

Head of the Higher Education and Research Division of the Council of Europe

Framework for Qualifications in the European Higher Education Area: real change of paradigm for higher education institutions? Forecast for 2010.

The presentation aims to outline the background for the development of an overarching framework of qualifications of the European Higher Education Area as well as the development of national qualifications frameworks compatible with the overarching framework. It refers to the relevant parts of the Bergen and London Communiqués and it will look at the functions of qualifications frameworks. It will also consider the elements that constitute a qualification as well as the relationship between national and overarching frameworks. The final part of the presentation will consider some key challenges in making qualifications frameworks an efficient instrument to promote the mobility of learners between as well as within education systems.

Qualification is made up of:

- quality
- workload
- level
- profile
- learning outcomes

Two types of qualification frameworks:

- National framework (closest to the operational reality, owned by national system, ultimately determines what qualifications learners will earn, describe the qualifications within a given education system and how they interlink)
- EHEA framework (facilitates movement between systems, face of “Bologna qualifications” to the rest of the world, provides the broad structure within which “new style” national qualifications frameworks will be built up)

Some challenges

- Meet the deadline (2010 was very optimistic: so far, only a few countries have implemented NQF's)
- Help developments in all EHEA countries
- Make Qualification frameworks a frame for making sense of diversity rather than a bureaucratic straightjacket
- Divert attention from systems and procedures to content and outcomes
- Make rational use of Qualification frameworks: higher education institutions, program design, QA, recognition
- Work with other regions of the world
- Avoid confusion EHEA framework/EQF

(see as well the published corresponding presentation – Power Point document)

2 Session A – The higher education institutions perspective

2.1 Presentation by Julia Gonzalez

Vice-rector of the University Deusto Bilbao, Spain

An example of implementation of the “Tuning descriptors”

The shift from an education mainly focusing on the inputs, teacher centred and content based gave way to output, student-centred and competence based learning, first in isolated cases. The Tuning Project turned this trend into collective work on learning outcomes as stages in competence-based learning. The identification, development, and evaluation of learning outcomes and competencies have now been discussed, planned, and jointly developed for seven years. The approach has been validated along a number of academic fields; while implementation has also started at different levels, particularly at institutional level. However, and within the variety of institutional attitudes reported in Trends V, also in this case, there is a significant variety: from Institutions who feel obliged to change, to those who push for change. The intervention deals with the implementation phase focusing on a case study.

The Spanish system was never thought to be measured – amount of lectures at higher education institutions were huge. Now it is work in progress - pilot groups are implemented. 5 are finished another 10 are on the way. Focus lies on programme level - every programme should be analyzed. In every programme there are the questions of level of knowledge and competencies and capacity.

Programmes are competence based – competencies is what should students aim at as opposed to learning outcomes. Level of competence is expressed in terms of learning outcomes:

- Learning outcomes are statements of what a learner is expected to know, understand and be able to demonstrate after completion of learning.
- Learning outcomes can refer to a single course unit or to a period of study- a programme. They specify requirements for awarding credit.
- Learning outcomes are formulated by the academic staff.

Key elements: identity, functions (tasks to be performed by graduates), Level of knowing and understanding, communication skills, ability to continue learning.

Competencies: Different from learning outcomes, which is a level to which competencies have been developed. They are defined by the academic staff.

Implications: macro competencies are translated in each area/module by the academic staff in specific competences. But beware of atomisation of several small competencies. Takes largely into the Tuning efforts. But there are generic competences as well, defined by the university as a whole.

Discussion:

Key factors during the implementation phase are:

- training of the staff
- time
- resources

Definition of learning outcomes and competencies?

- Competencies: longer development / cultural exercise
- Learning outcomes: description of the state that you reach in the competency.

(see as well the published corresponding presentation – Power Point document)

2.2 Presentation by Angela Ho

Head of the Educational Development Centre at Hong Kong Polytechnic University, Hong Kong

Institutional Efforts in Implementing the Outcome-Based Approach in Student Learning

The presenter shared with participants: a) how the Hong Kong Polytechnic University (PolyU) has conceptualized and implemented the outcome-based approach to curriculum development, teaching, learning and assessment; b) what PolyU has attempted to do and how it has done it; and c) her reflections on the implementation experience.

Instead of being imposed externally, PolyU took the initiative in outcome-based education and made a crucial move in a curriculum revision exercise in 2004. The primary goal was to enhance the quality of student learning.

The model of outcome-based approach adopted by PolyU composed of four essential elements:

- (a) defining intended learning outcomes;
- (b) designing curriculum, teaching, learning & assessment to support attainment of outcomes;
- (c) collecting data or evidence on student attainment of outcomes; and
- (d) using the assessment data to inform improvement of academic programmes.

With reference to concrete examples and cases, the experience of promoting outcome-based education in PolyU was discussed under eight topics:

1. Intended learning outcomes derived from PolyU's mission and strategic objective:

The Curriculum Revision Exercise started with a review of PolyU's mission and role statement which led to defining the overarching intended learning outcome for all PolyU programmes as: All-round students with professional competence. Accordingly all programmes and subjects are required to articulate outcomes, which encompass both "professional/academic knowledge and skills" and "attributes for all-roundedness".

2. Clarifying learning outcomes as "professional competence":

There had been much discussion among the academic community at the PolyU on the distinction between professional competence and academic knowledge. The concept of 'functioning knowledge', which allows students to apply academic and procedural knowledge to solve real life problems, is useful in shaping the learning outcomes of professional competence.

3. Mapping program outcomes to subject outcomes:

The alignment between subject outcomes and programme outcomes was found to be an area which demanded attention. To facilitate subject teachers to align subject outcomes with the expectation for professional competence and higher-level learning, they were prompted to think about:

- For what purpose do the students need to know this declarative/ procedural knowledge?
- What do you mean by understanding in your subject?

4. Setting appropriate standards and criteria

A 'pendulum effect' was observed. In the past, outcomes commonly addressed academic knowledge only. With the emphasis on 'professional knowledge' some outcomes were stated as high level competence expected for experienced professionals. This was rectified via discussion on 'what is achievable' among the programme teams to pitch the outcomes to the appropriate level expected of graduates.

As part and parcel of the strategic initiative of outcome-based approach, PolyU is committed to adopt criterion-referenced assessment. Many subjects spent effort in developing assessment criteria and rubrics.

5. Striving to achieve the institutional outcome of 'all-round development' for students

PolyU attempted to achieve 'all-round development' of students with institutional concerted efforts:

- a) All-round development is stipulated to be embedded in academic programmes
- b) Work-integrated education is made mandatory for all full-time undergraduate programmes
- c) A wide range of extra-curricular activities is organised by Student Affairs Office & Faculties / Departments for voluntary participation

However, there is still a long way for faculty members to embrace the development of generic competency in their discipline-specific curriculum.

6. Including a curriculum map in program submission

In the Curriculum Revision Exercise, programme teams were advised to include a curriculum map in the submission of the revised programme documents. Curriculum map provides a holistic view of the extent that each intended outcome will be taught and assessed in the programme and the progressive development of each program outcome via different subjects at different stages.

7. Aligning teaching, learning and assessment with intended learning outcomes

The PolyU's model of implementing an outcome-based approach is underpinned by Spady's theory on Outcome-Based Education and Bigg's theory of Constructive Alignment. Most of the effort in the first phase of the Curriculum Revision Exercise was put on enhancing the alignment of the teaching and assessment of the subjects with the intended learning outcomes as a strategy to enhance the quality of learning.

8. Building an outcome-focused quality assurance and feedback loop

The current phase of work is developing an institutional assessment plan. In this endeavour, PolyU started with a critical review of its existing quality assurance system and assessment practices. The plan is to propose a 2-tier model of assessment, where programme

assessment plans owned by the departments will become the core and be supplemented with data collection of the attainment of the institutional generic outcomes.

In sum, one major characteristic of the PolyU's model in implementing an outcome-based approach is its emphasis on alignment as a means to enhance the quality of teaching and learning at the classroom level. With the move to developing an institutional assessment plan, PolyU strives for parallel efforts on both quality enhancement and quality assurance.

Presenter's Reflections:

Institution-wide and sustained efforts are required throughout different phases of implementation. Ownership by faculty members at all levels is crucial and the 'change' should not be taken as a paper exercise.

Discussion:

How is the industry involved in this process at PolyU?

Since most programmes are applied programmes the consultation with external professional bodies is integrated from the very beginning.

How can colleagues be motivated?

Top down and bottom up approaches are both important. Senior Management of the PolyU indicates its commitment in several ways: professors are released part of their time to work on the outcome approach, and funding is provided to support staff in piloting teaching and assessment methods. The Educational Development Centre supports academic staff in the process. At the same time faculties and departments organise their staff to work on their programmes.

(see as well the published corresponding presentation – Power Point document)

2.3 Presentation by Martin Prchal

Chief executive of the European Association of Conservatories (AEC)

Conservatories and Descriptors

The presentation gives a practical example of the use of learning outcomes and the Dublin Descriptors in a highly specific subject area: higher music education. It explores the proactive approach by this sector to make the seemingly 'un-musical' principles of the Bologna Declaration process workable and relevant for higher music education institutions, while at the same time taking into account the rich and fascinating diversity of European music and music training. The learning outcomes have been briefly illustrated during the presentation through the participation of a music ensemble of (former) music students. The presentation also demonstrates the use of learning outcomes and Dublin Descriptors in a European subject-specific approach to quality assurance and accreditation in the field of music.

Music profession is changing – recognized qualifications are important. The Bologna process in higher music education:

- Due to the changing music profession in which portfolio and freelance careers are increasing, the recognition of qualifications is more important than previously.
- The student mobility increasingly needs higher levels of formalisation.

- To ensure the protection of the specific needs and characteristics of higher music education.

Outcomes in relation to the Bologna process

The following has been produced by the European Association of Conservatoires (AEC):

- An extensive trilingual website 'Bologna and Music'.
- A series of handbooks on the use of credit points, internal quality assurance, curriculum design and development and doctoral programmes.
- A European sectoral qualifications framework for higher music education with 'Polifonia/Dublin Descriptors' and AEC Learning Outcomes for the 1st, 2nd and 3rd cycles.
- A subject-specific and European framework approach towards quality assurance and accreditation, which includes the sectoral qualifications framework for higher music education and a set of subject-specific criteria and procedures.
- International comparability is ensured through the world-wide project 'Mundus Musicalis'.

AEC Learning Outcomes:

- Start formulation 2002 and continuous review process since 2004 in the framework of 'Polifonia'
- Initially 2 cycles, 3rd cycle added in 2006
- 'Tuning' methodology used in later stages
- Development of 'Polifonia/Dublin Descriptors' (PDDs)
- Practical (skills-based) outcomes
- Theoretical (knowledge-based) outcomes
- Generic Outcomes

(see as well the published corresponding presentation – Power Point document)

2.4 Panel discussion

Panellists:

- Peter Williams, President ENQA, Director of QAA, UK - Chair
- Thomas Angelo, Director of Teaching Development Center at Victoria University of Wellington, New Zealand
- Anne-Katrin Mandrup, Ministry of Science, Technologies and Innovation, Denmark
- Jürgen Kohler, Professor at Ernst Moritz Arndt University of Greifswald and former chairman of the German Accreditation Council, Germany
- Anne Mikkola, Executive Committee, ESU
- Michael Hörig, Project Officer, EUA

Comments on definitions of terms?

- Definition is vital. learning outcomes are placed between aims and competencies. learning outcomes are translated as relevance to the learner. What might be of significance at the end of the learning process.

- Relevance is an aim but not the only one. There are also system objectives such as transparency and information. Competencies are a soft aspect to the learning outcomes.
- Difference being able to do and attaining a status of being. learning outcomes as a formative element of a personality which is not identical with a competence.

Are there concerns that learning outcomes are burdensome / pros and cons of learning outcomes?

- Pros: focus on the learner, transparency and enhancement; structural aspects, framework for describing what one is doing.
- Cons: Needs considerable work. Starts with institutional mission. One should not forget how to do it specifically for each own country, instead of use a general framework. Students are considered as “things”, “subjects”. We mostly hear about the costs, resources. Danger of levelling, normalizing the higher education. “What are the differences of our system?” is a better question than wondering how to make them all systems look and work alike.
- Concept, assessment implementation – to define is both to describe and validate, judgment must be made on the quality of that statement. Who defines and what are valid viewpoints – the question of autonomy arises – whose autonomy is it? learning outcomes is a system of standards – anything normative runs the risk of description. Need for normativity to have clear descriptors. Status of standards for learning outcomes? What are they and to what extent do they need to be standardized?
- Learning outcomes are normative but they need to be broad enough to make adaptations.
- Choosing the metaphors is important – tuning did some very wise choices. Started earlier in the US. learning outcomes need to be about performance (in the world) – if u get the performances right then those intended performance show u what u need to know. Technical problems have been solved - fundamental issues are cultural issues – unless we move through disciplines and professions things can not be defined– only disciplines can define the performances.

Subject identity – explain the validity of the argument and then communicate to the community and get the community to take it up?

- What impact does one want to have: on the whole program or rather a part of the program. The question is if you want to be in the community to make an impact or not?
- Governments have important role – status matters most – incentive that can be offered – learning outcomes are only means to an end and should not be taken for more powerful than they are. Rating schemes are often not taking into account the learning achievements of the different institutions, which are ranked.
- Learning outcomes should be made for improving the quality of learning at individual institutions, not for comparisons between them. The NQF should be discussed within universities, with students, but not imposed as centralised decisions taken anywhere else. There are risks that this could happen.

Is there a conflict between learning outcomes as content of programme, and the ECTS as workload for the student?

- ECTS implies recognition that acquisition of competence requires a certain effort and time.

- The workload does not describe the amount of learning outcomes achieved. Problem with ECTS are due to misunderstandings and poor planning. Explaining the system better should make things better.

3 Session B – Learning outcomes and Accreditation & Quality Assurance systems

3.1 Presentation by David K. Holger

Iowa State University Chair of ABET's accreditation council, USA

ABET: an example of an outcome-oriented accreditation system in the U.S.

ABET is a federation of 31 technical and professional societies representing over 1.8 million practicing professionals. It accredits programs in applied science, computing, engineering, and engineering technology. Accreditation is not compulsory but it is very unusual that engineering programs are not accredited.

Objectives of accreditation:

- To assure that graduates of an accredited program are adequately prepared to enter and continue the practice of the profession
- Stimulate improvement of technical education
- Encourage new and innovative approaches to technical education and its assessment.

First the system was input oriented. In 1991 professional and academic sides agreed that a change was needed. ABET began a transition from a requirements approach to accreditation to an outcomes approach. The transition was motivated by strong consensus for change among all constituencies – industry/employers of graduates, faculty members, academic administrators, and professional societies. In 1992 the ABET Accreditation process review committee (APRC) was established. In 1995 APRC presented his report „Vision for change“. 1996 the much more outcome oriented „Engineering Criteria 2000“ issued. 1996–2000 the pilot and transitional visits took place.

To create and modify the criteria primary constituencies were driven by the engineering professions, not by the political administration. The proposed change was recommended by a commission and approved by ABET Board of Directors for comment. There was comment from any interested party. Modification and final approval were made by ABET Board of Directors.

Overarching expectations:

- Adequate preparations for entry into a professional career
- Holistic program outcomes focus rather than requirements focus
- Adequate processes leading to continuous program improvement.

The current EAC (Engineering Accreditation Commission) criteria comprise 8 areas (Students, Program educational objectives, Program outcomes and assessment, Professional component, Faculty, Facilities, Institutional support and financial resources, Program criteria). They apparently do not seem to be outcome oriented. But all areas have to be formulated outcome-oriented. Looking for example at facilities they must allow to facilitate the learning outcomes.

In 2002 a study was undertaken to assess whether the implementation of the new Engineering Criteria had the intended effects („Engineering Change: A Study of the Impact of EC2000“). It showed the following key findings:

- Greater emphasis on professional skills and active learning
- High levels of faculty support for Continuous Quality Improvement (CQI)
- 2004 graduates are better prepared than 1994
- Professional skills gained; technical skills maintained
- National employers see more improvement than local employers
- EC2000 outcomes continue to be important.

The expectations of the Engineering Accreditation Commission (EACa) are being met. There is no debate about the importance of the outcomes. But the shift to learning outcomes is not easy.

(see as well the published corresponding presentation – Power Point document)

3.2 Presentation by Karl Dittrich

Chair of NVAO, The Netherlands and Flanders

Small countries, large outcomes? Will learning outcomes improve the quality of learning?

Higher education in the Netherlands and Flanders has been developing towards a competence based education system since the beginning of the '90s. It showed positive effects on students. Many teachers had difficulties to change their way of teaching. But external societies continued to put pressure on institutions. The importance of factors like transparency of educational institutions, interdisciplinary competences, etc. grew.

The Dublin Descriptors and learning outcomes are well established in the Netherlands and Flanders. Universities of professional education in particular, as well as Dutch universities of technology, have made real progress in designing their education programmes to fit this new structure. This was an advantage for introducing an outcome-based accreditation system.

The most important benefit of learning outcomes is consciousness of intended results, which means that there has to be cooperation between teachers. Other benefits are increased transparency, growing possibility for internationalization – an absolute must for small countries like the Netherlands and Flanders, life long learning and limiting individualisation.

In the Dutch/Flemish accreditation system final qualifications are the intended learning outcomes of a programme. These five descriptors are a tool for describing learning outcomes, so that account can be taken of the desirability of not only raising the knowledge component to the desired level but also other elements that are (or could be) considered necessary for bachelor's and master's degree graduates to be able to perform at the correct level.

Questions in the NVAO frameworks for (initial) accreditation:

- “What does the programme intend to achieve?” (Themes: aims and objectives, final qualifications: transfer from intended learning outcomes to educational goals).

- “How will the programme achieve its objectives?” (Themes: curriculum, learning assessment: transfer from intended learning outcomes to evaluations, tests and examinations).
- “Does the programme realise its objectives?” (Theme: results: transfer from intended learning outcomes to final thesis, project or paper).

Possible dangers, concerns:

- Skills – like team spirit, communication skills – might be favoured above knowledge. There is also a problem of terminology, since competence is commonly used to refer to skills.
- Top down introduction. Research universities can better resist to this top down than universities of applied sciences.
- Difficulty of assessing
- Too dominant role of business community. They tends to a short sized view of education confronted by the pressing needs of the labour market.
- Diversity and differentiation are important.

In a learning outcome oriented education system all teachers are forced to collaborate in thinking out the aims and objectives of a programme and in achieving the learning outcomes. The use of learning outcomes will lead to transparency of education for students, teachers and the labour market while they are necessary for describing qualifications within the context of the comparability of European degrees and diplomas that is needed for further internationalisation. Higher education sector should be responsible to define the content of the programs. But defining learning outcomes makes it necessary to have a good relationship with the professional field

(see as well the published corresponding presentation – Power Point document)

3.3 Panel discussion

Panellists:

- Richard Lewis, Former president of INQAAHE and former Pro-Vice-Chancellor at UK Open University - Chair
- Frank Murray, President of the Teacher Education Accreditation Council (TEAC), USA
- Etelka Tamminen Dahl, head of Office for Education Development and Evaluation at the University of Bergen, Norway
- Rainer Künzel, Academic Director of ZEVA, Germany
- Andrée Sursock, Deputy Secretary General, EUA
- Janja Komljenovic, former Executive Committee member ESU

Drive toward standardization?

Learning outcomes are not the first attempt to systemize and to describe what universities are teaching – there were other descriptions before Bologna. But with the shift to learning outcomes it is important to preserve the diversity within EU higher education.

Learning outcomes and QA-agencies?

The driving force is competition: QA-agencies provide relevant information, transparency and objective information within the market of education.

QA-agencies can have a positive influence on the learning outcomes approach in the institutions but many institutions have only a vague idea of the concept (frameworks, learning outcomes, ECTS). It will take much time to evolve and people must not be rushed. A lot of training is needed for all stakeholders by way of conferences and workshops about these new concepts and approaches. National QA-agencies and rector's conferences should work together.

Will the shift to learning outcomes have a big impact on accreditation?

In general accreditation shouldn't change so much but a reflexion is needed on the content which still has to be in the responsibility of the universities. The main shift is focused on the evidence: Programmes do claim what they are going to do – it is legitimate to assess if these objectives are reached and make statements about what the graduates can do.

Impact of higher education on students: studies in US showed the importance of elements outside the classroom – education is not a linear but a very complex process with multiside relationships. The value of an academic education is not only defined by knowledge but also by the ability of scientific reasoning, methodological abilities and communicational skills. This has to be taken into account by QA-agencies.

4 Session C – Are “learning outcomes” useful for employers and recruiters?

4.1 Presentation by Ulises Pabon

Executive Vice President of Quality for business Success Inc., Puerto Rico

The future of work

The challenge for today is to figure out how to prepare students for jobs that do not exist yet? One could say that universities have always done that, but nowadays, if we go on with the «revolution » of communications, it is not likely to go on at the same speed. The future of work is not a new topic. But globalization and communication technologies are tremendously changing the way we are going to work.

How do technologies change our world? Robert Solow, 1987 Nobel Prize in Economy, has been wondering why the use of computers does not boost the US economy. See examples of new technologies which have changed our lives - it needs 25 years for them to move into their “productivity” stage. Explanation: it takes time to built the infrastructure needed to exploit the innovation. Illustrations: “hockey cross” shape of the development OK for trains, telephone, electric generator. How about computers? They appeared in 1946 (early stage), after 48 years internet has been emerging. So these technologies can be considered still in their infancy.

Six forces, emerging trends, which drive the change in the way we will work in the future:

- Networking: (ARPA, DARPA). Internet: removes the walls between sources of information. Activities on same research fields are occurring all over the world simultaneously.
- Concretion: example: Wikipedia has only 2 full time employees but thousands of people working for it, eol.org (1 electronic page for each thesis over the world), social media and future of journalism (“we tell you how to tell each other what is happening, instead of doing it ourselves!”)

- Globalization and triple convergence.. Now people think of globalization only as a transfer low-qualified work to third world countries. But there will be much more: qualified work can be globalized, for example by sending medical images to specialists all around the world.
- Open innovation: a new trend is to ask customers about how things could be improved. More and more small companies are active in R and D.
- Ubiquitous computer: Trend from “older days” (1 computer, many users), PCs (one computer, one user), now (one person, many computers (PDA, GPS, car computers, etc.)). In the future: an artificial knee will “talk” to the doctor’s computer to say how it is doing!
- Co-development of biology and computing: Impact of biology in computing and vice-versa: the DNA coding has required huge efforts in information processing, which has induced massive progress in computing capabilities. In return, biology could be the future of computing, thanks to the storage capabilities of bacteria’s DNA.

Implications for the future needs for competencies:

- In the future, there will be a need for high-end specialists, with deep specialized knowledge of their field, but capable of working with others. No discipline will bring solutions by itself.

(see as well the published publication link)

5 Concluding remarks by Nick Harris

Deputy Director of QAA, U.K.

Learning outcomes:

- a good and valid idea .. but .. hard to specify and use
- should focus on what people know and can do
- higher education institutions and QA agencies need to work together (more)
- largo deciso (slow but definitely ongoing)

Theory: “*Learning Outcomes are ‘good things’*”:

- for ‘explaining’ (to those that don’t know – ‘stakeholders’)
- what higher education is all about – what it is ‘delivering’ ..
- for quality assuring higher education

Evidence:

- do they ‘explain’ – or merely describe/define (too many definitions being developed?)
- they are good for ‘measuring’ some things (the ‘know / can do’ etc) but for higher education?

“Language is a key” - definitions:

Aims - learning outcomes -- competences (*uncertain relationships*)

Education is also about

- ‘thought’/‘innovation’
- developing values and attitudes
- plurality and maturity

Status of learning outcomes?

- role of the discipline communities (to represent or serve? “to make an impact or just participate?”)

Learning outcomes and ‘workload’

- independent of ‘defined’ time?

“A voyage of discovery into an open ocean” or “a ‘canal’ voyage constrained by the ‘boundaries of politics and employers?”

(see as well the published corresponding presentation – Power Point document)

6 Workshop by Gloria Rogers

ABET’s associate executive director of professional services, USA

“How to design and to assess learning outcomes in higher education”

Goals of the workshop

Help institutions, faculties and programme officers to design, assess and evaluate curricula/programmes, which are based on educational objectives, learning outcomes and performance criteria (demonstration and evaluation). The main focus lies on the definition and assessment of learning outcomes (“the development of measurable student learning outcomes”).

Terminology

The definition and assessment of learning outcomes and the principles of continuous quality improvement ask for terminology and definitions: “if you can’t define it you can’t measure it”. In this context it is important to know that assessment requires both collection of meaningful data and interpretation of these data in order to produce evidence.

Methodology for defining learning outcomes

The methodology can be described as follows: Define educational objective / define learning outcomes / define performance criteria.

Faculties / Institutions should think of designing learning outcomes of the whole program and not only of individual courses, which requires teamwork. To formulate the performance criteria of learning outcomes it is important to have an action verb combined with the (intended) content. There are several approaches of assessment methods: indirect (like written surveys and questionnaires) and direct (like oral exams or simulations) assessment methods.

Exercises

A number of “exercises” have been provided, giving examples of how faculty members can be advised to work together towards definitions of educational objectives, learning outcomes and performance criteria in their fields. Different and innovative ways to assess student achievement as well as course success are discussed (“In the classroom we are assessing

students, at programme level we are assessing ourselves”). Concrete examples have been discussed and practical documents provided.

Results

Clues about the introduction of well-defined learning outcomes at programme level:

- use of common language
- clear expectations
- guide instruction / implementation of strategies
- enable self-assessment
- promote valid assessment

Besides of having learning outcomes clearly defined, it is important that the number of performance criteria linked to these learning outcomes remain manageable. The methods must be appropriate to programme context, data (but only relevant ones) are efficiently and systematically collected. The results are evaluated.

The definition of learning outcomes at programme level should be seen as a process going on for at least 4-5 years, and not as an event. Accreditation organisations may support the institutions, for example by contributing to the dissemination

(see as well the published corresponding presentation – Power Point document)