The Second International Conference on e-Learning (eLearning-2011), 29-30 September 2011, Belgrade, Serbia

E-LEARNING BENCHMARKING: METHODOLOGY AND TOOLS REVIEW

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Abstract: *This document is a review of most significant EU and international benchmarking approaches, models, and tools developed so far. Special attention is given to identification of key features that can help higher education institutions to create and implement benchmarking model of e-learning.*

Keywords: *E-Learning, Benchmarking*

1. INTRODUCTION

Benchmarking is "the process of comparing one's business processes and performance metrics to industry bests and/or best practices from other industries." Dimensions typically measured are quality, time, and cost. Improvements from learning mean doing things better, faster, and cheaper

Benchmarking involves the comparison of the quality of a product or service against other providers. Usually the 'other providers' are selected based on competition, thematic areas, or just those deemed to be 'the best' of the others. Its main function is to be a self-evaluation and self-improvement tool by which an institution identifies its own position, compares it with others and then designs an improvement plan to close the gap [1].

The use of benchmarking as a tool for evaluating e-learning is rather new, although it draws upon a larger base of experience on benchmarking in other areas. Benchmarking as a tool for quality assurance is very much related to quality standards and guidelines, although these are not necessarily plainly transferable into a benchmarking tool, and it is argued that benchmarking could be carried out without any explicit standard as a reference [2].

Nowadays, it is understood that each university offering distance learning (DL) programs should adopt a benchmarking system as a part of its DL quality assurance (QA) procedures. Any such a benchmarking system assumes a specific benchmarking model/approach and a set of associated tools that support the benchmarking process. A benchmarking model/approach must cover three essential elements (and provide associated sets of indicators) [3]: a structural element – based on "enablers"; a practice element – based on work; and, a performance element – based on outcomes and impacts.

This document is a review of most significant EU and international benchmarking approaches, models, and tools developed so far. Special attention is given to identification of key features that can help higher education institutions to create and implement benchmarking model of e-learning.

2. BENCHMARKING CONTEXT

Although it is acknowledged that benchmarking has its origins in the business sector, the particularity of higher education is stressed in many publications on benchmarking in higher education.

Some authors refer to classifications from general benchmarking literature; others try to develop descriptions specifically for higher education. One of the highly cited general classifications is that by [4] who identifies four kinds of benchmarking:

- Internal benchmarking
- Competitive benchmarking
- Functional/industry benchmarking
- Generic process/"best in class" benchmarking

The standard report on benchmarking in UK universities [5] describes various types of benchmarking:

- implicit (by-product of information gathering) or explicit (deliberate and systematic);
- conducted as an independent (without partners) or a collaborative (partnership) exercise;

- confined to a single organisation (internal exercise), or involves other similar or dissimilar organisations (external exercise);
- focused on the whole process (vertical benchmarking) or part of a process as it manifests itself across different functional units (horizontal benchmarking);
- focused on inputs, process or outputs (or a combination of these);
- based on quantitative (metric data) and / or qualitative (bureaucratic information).

[6] uses similar descriptions for the following types of benchmarking in the higher education sector, referring to internal benchmarking (comparing similar programmes in different components of one higher education institution), external competitive benchmarking (comparing performance in key areas based on institutions viewed as competitors), functional benchmarking (comparing processes), trans-institutional benchmarking (across multiple institutions), implicit benchmarking (quasi-benchmarking looking at the production and publication of data/performance indicators which can be useful for meaningful cross-institutional comparative analysis; these are not voluntary like the other types but are the result of market pressures and coordinating agencies), generic benchmarking (looking at basic practice process or service) and process-based benchmarking (looking at processes by which results are achieved).

[7] defines four types of benchmarking linked to the voluntary participation of institutions, i.e. internal benchmarking (with the comparison of performance of different departments), external competitive benchmarking (comparing performance in key areas based on information from institutions seen as competitors), external collaborative benchmarking comparisons, with a larger group of institutions who are not immediate competitors, external trans-industry (best-in-class) benchmarking (looking across industries in search of new and innovative practices). Alstete adds a fifth category, the so-called implicit benchmarking, which results from market pressures to provide data for government agencies and the like.

In ENQA report "Benchmarking in the Improvement of Higher Education" [8] the European Network for Quality Assurance attempts an understanding of the principles of true benchmarking, providing concrete examples and conclusions on perspectives for European benchmarking within higher education. ENQA provides a list of 32 attributes given to benchmarking, the main ones being collaborative/competitive, qualitative/quantitative, internal /external, implicit/explicit, horizontal/vertical; outcome-oriented or experience-seeking, with various purposes (standards, benchmarks, best practices) and interests (to compare, to improve, to cooperate), depending on the owners of the benchmarking exercises.

The list is rather arbitrary and does not express a systematic thinking about different approaches to benchmarking. Some items remain vague and it is left to the reader to imagine what is meant by some like 'touristic' benchmarking. ENQA concluded that "good instruments are needed for useful benchmarking exercises" and that "current benchmarking methodologies in Europe must be improved".

Although the key benefits of benchmarking are well-known, there is still a significant gap in the use of benchmarking practices in European HEIs. Indicators and benchmarks are needed by university leaders to make informed choices for strategic developments and support the competitiveness of HEIs on the international scene.

3. RESEARCH AND EVALUATION

A wide range of literature was surveyed, including from the UK university sector, Australian and other Commonwealth reports, concerned with distance learning quality. A range of European agencies, projects and so-called "benchmarking clubs" were reviewed. The literature search started with a Google search on "benchmarking AND e-learning" and spreading out from that to related searches, making sure that agencies and countries were covered which in the judgement of the researcher were likely to have information on benchmarking. We found that there is a considerable amount of literature on benchmarking in universities but it is mostly oriented on quality approaches and traditional educational settings and rarely include recent educational innovations and e-learning. It was surprising how little was focussed on developing benchmarking tools.

Bearing in mind that rapid development of tools and technologies as well as increased use of mobile devices for learning has significantly changed e-learning models, we have decided to start our research[1] by analyzing benchmarking projects chronologically - from 1990s until today. Using literature sources and our experience in e-learning management, a table was drawn up for comparative analyses regarding various characteristics and approaches of the most noticeable EU and worldwide benchmarking projects: BENVIC [9], CHIRON [10], ELTI [11], ACODE [12], MASSIVE [13], MIT90 [14], PICK&MIX [15], OBHE [16], OpenECB [17], eMM [18].

We found that benchmarking in the higher education sector have developed from the mid-nineties at the national level, either as an initiative launched by a national body, by one or a group of institutions or by an independent body. These usually only involve a small number of institutions and are on a voluntary basis. Transnational level exercises have so far been fairly limited. These benchmarking exercises have adopted a mixture of quantitative, qualitative and processes-oriented approaches. The degree to which these are structured depends on the experience and the purposes. Only a few of them (Pik&Mix, eMM, OpenECB) have developed benchmarking tools in the form of Excell worksheets.

[1] These research studies are established under the framework of the TEMPUS project "Enhancing quality of Distance Learning at Western Balkan Higher Education Institutions" and are delivered online (http://www.dlweb.kg.ac.rs/).

Regardless of previous, it should be noted that outputs of past benchmarking projects are valuable source of information for all HE institutions for planning benchmarking. Most indicators defined in past projects are basis for current benchmarking initiatives.

4. CURRENT EU BENCHMARKING INITIATIVES IN HE

In following paragraph we review number of current EU project activities, organisations and studies that relate to quality approaches and benchmarking in e-learning and distance education.

ESMU

Established in 2000, the ESMU [19] benchmarking programme aims at measuring and promoting good practices in university management. The programme works on an annual basis and focuses on management processes such as internal quality assurance, student services, e-learning strategies, and research management. Quantitative indicators are gathered but questionnaires focus on qualitative data gathering related to management processes.

Benchmarking in European Higher Education

Benchmarking in European Higher Education is a project funded by the European Commission to improve benchmarking in higher education. It is designed to help modernise higher education management and to promote the attractiveness of European Higher Education. It supports HEIs and policy makers to better realise the Lisbon goals and the Bologna Process.
The following is available from the Benchmarking in European Higher Education website:

- An online tool with examples, advice and an online bibliography
- A practical handbook with a review of the literature and a step by step approach to benchmarking
- A report of extensive desk research carried out on benchmarking in higher education
- Guidelines for good practices for effective benchmarking
- An ongoing platform to promote exchange and good practices for benchmarking in higher education.

Table 1.

No.	1	2	3	4	5
Name (ABBREVIATION)	**MIT90s**	**OBHE**	**BENVIC**	**ELTI**	**CHIRON**
Initiative (Project)	University of Strathclyde	Observatory on Borderless Higher Education	Open University of Catalonia	Developed under the JISC[2] project.	Leonardo da Vinci Programme coordinated by ESCOM[3]
Time period	1990s	1996-present	1999-2001	2001-2003	2004-2006
Main characteristics	Strategic framework for managing IT Business transformation levels	Methodology where a group of institutions get together and jointly agree relevant areas of interest and in a later phase, look for good practices.	Educational approach to evaluation of "virtual campuses" experiences throughout Europe. General framework for benchmarking of open and flexible learning programmes.	A learning technology audit designed to collect information that is useful to the institution about the 12 key factors in learning technology development.	-
No. of Benchmark areas (criteria)	cross-correlation with other frameworks	8	8	4	11
Total No. of indicators	variable	variable No. of statements	102	Up to ten indicators are agreed for 12 key institutional factors (around 120)	216
Implicit/explicit	explicit	explicit	explicit	Implicit	Explicit
Conduction method (independent /collaborative)	self assessment/collaborative	self assessment/collaborative	self assessment/collaborative	independent	self assessment
Internal or external exercise	inconclusive[4]	internal	Internal and external	internal	internal
Process focus (vertical/ horizontal)	inconclusive[4]	vertical and horizontal	vertical and horizontal	vertical and horizontal	inconclusive[4]
Focused on inputs, process, outputs or combination of these	inconclusive[4]	inconclusive[4]	combination	Process	Outputs
Metric (quantitative or qualitative)	Quantitative	Qualitative	Quantitative and qualitative	Quantitative and qualitative	Qualitative
Scoring system	1-5 (Levels 1 and 2 evolutionary levels;3, 4, and 5 revolutionary levels)	Statements of Good practices	0-2 scale (0 Not implemented; 1 Partiallyimplemented; 2 Fully implemented)	1-5 (1 Not true; 2 Emergent, 3 Partly true, 4 Largely true; 5 True)	Statements of Good practices

[2] See http://www.jisc.ac.uk/

[3] See http://www.semionet.fr/FR/default.htm

4 Authors were uncertain about the attribute due to insufficient sources

Tools	none	none	Questionnaire for positioning virtual campus List of indicators	ELTI workshop pack which contains the Audit Tools, the Audit Notes and the Facilitator's Guide	none
Links	none	http://www.obhe.ac.uk	http://www.benvic.odl.org	http://www.jisc.ac.uk/whatwedo/programmes/programme_jos/project_elti.aspx	http://semioweb.msh-paris.fr/chiron/

Table 2.

No.	6	7	8	9	10
Name (ABBREVIATION)	**ACODE**	**MASSIVE**	**PICK&MIX**	**eMM**	**OpenECB**
Initiative (Project)	Australasian Council on Open, Distance and e-Learning	University of Granada	Methodology developed by prof. Paul Bacsich	trialled in the Higher Education Academy Benchmarking Pilot, by the University of Manchester	InWent – Capacity Building International, Germany and (EFQUEL)
Time period	2004-present	2005-2007	2005 - present	2005-2008 Phase 1	2008-2010
Main characteristics	discrete benchmarks that can be used alone or in combination with others	MASSIVE project was aimed at designing a model of mutual support services for EU traditional universities to successfully implement the virtual component of teaching. Within the MASSIVE project, a peer review model/service was designed and tested.	Pick & Mix does not impose methodological restrictions and has incorporated (and will continue to incorporate, in line with need) criteria from other methodologies of quality, best practice, adoption and benchmarking.	E-Learning Maturity Model (eMM) provides a means by which institutions can assess and compare their capability to sustainably develop, deploy and support e-learning.	Accreditation and quality improvement scheme for e-Learning programmes and institutions in international Capacity Building
No. of Benchmark areas (criteria)	8	Six relevant service areas	Defined by total number of criteria (core plus supplementary plus local) that an HEI should consider.	5 process areas, 34 processes	7
Total No. of indicators	74	Criteria have been identified for each service area to identify good practices for peer review	53 20 – core 5 supplementary (optional)	each process with 5 dimensions and variable no. of practices (around 1000)	52
Implicit/explicit	explicit	Explicit	Explicit	explicit	explicit
Conduction method (independent /collaborative)	self-assessment/collaborative	Collaborative/peer review	self assessment/collaborative	self assessment/collaborative	self assessment/collaborative
Internal or external exercise	internal and external	External	internal and external	internal or external	internal and external
Process focus (vertical/ horizontal)	vertical and horizontal	Vertical	vertical and horizontal	vertical and horizontal	Inconclusive[5]
Focused on inputs, process, outputs or combination of these	inconclusive[5]	Process	Outputs and process	combination	Inconclusive[5]
Metric (quantitative or qualitative)	Quantitative	Qualitative	Qualitative	Qualitative	Qualitative
Scoring system	1-5 (level 5 indicates best practices)	Inconclusive[5]	1-5 scale (level 1 is always sector-minimum and level 5 is reachable sector best practice)	Fully Adequate; Largely Adequate; Partially Adequate; Not Adequate; NotAssessed.	0-3 (not met, partly met, met adequately, met excellently)
Tools	Toolkit (Phase 2)	Methodology report	Pick&Mix version 2.6 beta 3 workbook (Excell)	eMM 2.3 Assessment workbook (Excell)	Toolset (Excell)
Links	http://www.acode.edu.au/	http://cevug.ugr.es/massive/index.html	http://elearning.heacademy.ac.uk/wiki/index.php/Pick%26Mix	http://www.utdc.vuw.ac.nz/research/emm/index.shtml	www.ecb-check.org

5 Authors were uncertain about the attribute due to insufficient literature sources

ECIU

The benchmarking initiative of the European Consortium of Innovative Universities, ECIU [20] was established in different phases: the first phase began in 2004 with the project Administration of innovative universities; the second in 2005 with the project International Mobility of Students; and the third phase started in 2006 with the Difuse Project: Driving Innovation from Universities to Scientific Enterprises (www.difuse-project.org).
The benchmarking exercises used a mixture of quantitative and qualitative methods and peer reviews. In particular in the benchmarking exercise on administration overall, ECIU used Burton Clark's book on entrepreneurial universities (1998) as a starting point and benchmarks against which to identify how some ECIU universities were performing in developing administrative processes to support fully their mission of being innovative universities.

The Aarhus Benchmarking Network

In 2006, Aarhus University initiated a benchmarking exercise [21] inviting the four universities of Kiel, Bergen, Gothenburg and Turku to join. The benchmarking exercise was launched for an initial three-year period focusing on research management, management of international Master's programmes and PhD studies. Aarhus coordinates the initiative.
Annually, the universities' Rectors meet. In addition, the partners organise two to three face-to-face meetings every year and engage in intermediate communication by email and by telephone.

E-XCELLENCE+

E-xcellence is a web-based instrument focusing on e-Learning in higher education. It is a quality benchmarking assessment tool that covers the pedagogical, organisational and technical frameworks with special attention on accessibility, flexibility and interactiveness [22].
E-xcellence is a product of a two-year project started in 2005 with the support of the eLearning Programme of the European Commission (DG Education and Culture), where the main objective was to set a standard for Quality in e-learning. EADTU started in 2008 with E-xcellence+ to valorising the developed QA tools. An important aspect of E-xcellence+ is that it offers a European-wide set of benchmarks, independent of particular institutional or national systems, and with guidance to educational improvement.
The basis of the E-xcellence benchmarking process is to use an instrument (QuisckScan Tool) that is built on dialogue. It is based on the E-xcellence manual which contains the benchmark statements (total 6), along with the criteria and indicators: Strategic Management, Curriculum Design, Course Design, Course Delivery, Staff Support and Student Support. There are 50 excellence benchmarks (33 of them considered as threshold) directly related to e-Learning specific quality criteria. The scoring system uses qualitative metrics as a measure of appropriateness: Not Adequate; Partially Adequate; Largely Adequate or Fully Adequate.
These form the basis for self assessment, with the possibility for both internal and external exercise.

SEVAQ+

SEVAQ+ is a European-wide initiative for the Self-evaluation of quality in technology-enhanced learning, based on an innovative combination of the Kirkpatrick evaluation model for learning and the EFQM excellence model. SEVAQ+ aims to engage in wide-reaching dissemination and exploitation of the results of a Leonardo da Vinci pilot project (2005-2007): the SEVAQ tool and concept for the Self- Evaluation of Quality in eLearning [23].

SEVAQ+ is designed to be used by a range of learning organisations – professional training centres, in-company training departments or universities – to evaluate the quality of any teaching and learning supported by technology, whether it concerns totally online distance courses or blended learning. SEVAQ+ enables to engage in analysis of feedback from the major stakeholders involved in technology-enhanced learning systems and:

- pinpoint areas for improvement,
- track progress from one semester or year to the next,
- benchmark teaching and training against other institutions.

The SEVAQ+ tool can be used by: teachers and trainers to design questionnaires to gather feedback on what learners really think of their learning experience, training managers to get the full picture by designing questionnaires for the different stakeholders involved. Also organisations can use the results of SEVAQ+ to benchmark against others using SEVAQ+ and learners get the chance to give their point of view and contribute to improving the quality of learning.
SEVAQ+ follows a logical structure inspired by the EFQM quality framework, combined with the Kirkpatrick evaluation model. To design a questionnaire, one can choose which Criteria and Sub criteria to focus on (achievement of learning goals, efficiency of the technical support, effectiveness of the pedagogical approaches, quality of the learning resources,…). These criteria are organised within an overall framework of Resources, Processes and Results. The SEVAQ+ tool then proposes a series of statements [23]: one can choose those which best reflect the reality of the context that is going to be evaluated.

5. CONCLUSION

In terms of the value that benchmarking tools might offer as tools for assuring the quality of e-learning courses, it seems that benchmarking works at a different level and for a different purpose from quality assurance, making its value for quality assurance and enhancement of courses limited. Although it may be expected that a benchmarking activity eventually provides the basis for improving the quality of the e-learning provision in an institution, this potential benefit might well come as a result of the

application of a specific tool (and its specific criteria) rather than from benchmarking as a strategy.

The approaches reviewed however are not equivalent, as they do not operate at the same level, and in that sense, they could be in place simultaneously in the same institution. The DL building blocks typically covered by benchmarking include:

- institution policy and governance
- information technology infrastructure to support learning and teaching
- support for the use of technologies for learning and teaching
- planning and quality improvement related to technologies for learning and teaching
- pedagogical issues
- professional/staff development
- target audience orientation
- management and leadership of DL
- resources for learning and value for money
- quality of the content
- media design
- information about & organization of the programme
- programme/course design
- learning services

One of the riskiest aspects of benchmarking is the dissemination of results within the benchmarking network and beyond the group. Beside this we must also took into account questions on finance. Data collection takes a large amount of time, due to the size of an initiative, the results might easily be outdated. The need for adequate human resources is obvious. Sometimes, carefully selected and trained experts or external facilitators seem to have a positive impact on a benchmarking process, while also being cost-efficient. The data processing should also be streamlined according to the process.

Another critical factor includes indicators. In the analysis, it became clear that they have to be broader than pure input indicators and should incorporate output measures and/or processes. Both types of indicators, quantitative and qualitative, seem to be necessary, as most issues are best compared by using a mix of quantitative and qualitative methods. In particular, process analysis cannot always rely on quantitative indicators. The relevance of the purpose is vital for their selection; availability of data is not a recommendable reason for selection. In addition, indicators seem to be more useful if they can link outcomes and outputs to inputs

It is possible to combine issues from several approaches and tailor them to fit the needs of a specific HE institution. In addition, it is also possible to use tailored versions of tools developed for use within a specific approach/methodology, such as QuickScan and SEVAQ+. However, if any reporting is done, it should be effective and efficient, producing well-structured, transparent, and comparable information (qualitative/quantitative) with the view to identify good practices and to apply measures which would enhance the credibility and the visibility of the benchmarking exercise.

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