Educational quality enhancement by self-evaluation and cross-sparring

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Abstract. This paper discusses how the quality of higher education can be improved by using a method of sharing and critique. Starting with a self-evaluation and followed by cross-sparring with "critical friends", this new approach has proven to be successful in initiating change. With the focus as much on quality enhancement as quality assurance, the engagement and attractiveness of higher education are key considerations of the development activities that are inspired by the method. This method was developed in three consecutive projects involving a dozen European universities. The method is partly similar to the one used by CDIO (www.cdio.org) which is originally an international network of engineer educators. CDIO's basic idea is to enhance and improve the quality of university processes for enabling a better match between working life requirements and higher education. For the time being, the method of self-evaluation and cross-sparring has been applied at degree program level, but it is applicable to institutional levels as well as to educational sub-processes, like virtual education or accessibility considerations.

Key words: quality enhancement, quality assurance, self-evaluation, cross-sparring, CDIO

1. Introduction

In current higher education, universities are constantly trying to balance the time spent and resource allocated to the areas of Quality Assurance (QA) and Quality Enhancement (QE). Often the quality assurance element dominates as a measure identified by institutions and accrediting authorities for ensuring a high level and consistent tertiary learning provision. University rankings play an important role, and quality assurance work is seen as a driving improvement. Quality enhancement is often only identified in bespoke projects or it is left to the enthusiasm of program managers and individual teachers. This can be considered a missed opportunity as a robust embedding of quality enhancement is likely to have a greater impact on student learning, and any league table rankings that may be produced. [1]

The new method discussed in this paper is partly based on a method used by CDIO (www.cdio.org), an international network of engineer educators [2]. Its basic goal is to

enhance and improve the quality of university processes for enabling a better match between working life requirements and higher education. CDIO stands for Conceive – Design – Implement – Operate. By tradition, higher education has shown its good competence in teaching design and implementation principles, while almost ignoring open-ended problems and operational issues like usability, accessibility, sustainability, and life cycle concerns. The CDIO approach highlights these challenges and its principles are transferable and adaptable in all disciplines.

Originally the CDIO network was established in 2000 as a project of Massachusetts Institute of Technology (MIT) and three Swedish universities (Royal Institute of Technology, Chalmers and Linköping). After the initial phase, the CDIO operations are well-established. Nowadays, more than 120 universities worldwide belong to the CDIO network of members.

The CDIO approach forms a framework to enhance and develop education. It offers general development tools, but each university, faculty or program should apply and adopt its principles into their own context and framework. The fundamental elements of the CDIO approach consist of the CDIO principles (called standards) and CDIO learning objectives.

2. How to enhance and improve

This paper describes two different methods, which have been developed and used in evaluating processes in higher education. The first one is based on the CDIO approach and it lays mostly on self-evaluation at degree program or institutional level. In a recently completed Erasmus project, called “Quality Assurance and Enhancement Market Place for Higher Education Institutions”, the CDIO ideas were further developed by increasing the number of evaluation criteria from 12 to 28 but also by adding cross-sparring actions after the self-evaluation phase.

CDIO consists of 12 principles or standards as they are called. They approach the education from many different perspectives such as learning experience, pedagogy, faculty development and assessment. Each standard is described with articulation and self-evaluation scale enabling to analyze the status of development of a degree program.

The CDIO learning objectives describe the competences that the CDIO program highlights. The objectives are grouped into four categories: (1) technical, (2) personal, (3) teamworking and communication, and (4) innovation. In addition, competences related to entrepreneurship and leadership are lately added and described. Each collaborative program is encouraged to employ these learning objectives while planning and composing their own curriculum.

The goal of the CDIO approach is to indicate clearly how education should be improved, which is an example how the CDIO approach differs from the European EUR-ACE quality label. EUR-ACE focuses more on what-issues, but EUR-ACE does not indicate how the enhancement and improvement should be done.

The CDIO approach does not cover all areas of EUR-ACE, and it also has areas that are not covered by the EUR-ACE quality system.

The CDIO approach invokes universities to frequent and continuous self-evaluation based on the CDIO scales. The results of these evaluations typically disclose internal

information of the university, and the results are not meant to be used for comparing universities or programs. Indeed, many universities have used the CDIO self-evaluations as a part of their external accreditations.

The main objective of the CDIO self-evaluation is to acquire information for internal development purposes of the university and degree programs. These self-evaluations often disclose interesting information that other universities and programs should use for learning new approaches but they also give valuable feedback mutually.

Helsinki Metropolia University of Applied Sciences has participated in three international projects that were carried out during recent years to develop practices and to promote this kind of mutual dialogue between universities and degree programs. In each project, the participating degree programs used the developed methodology to carry out self-evaluations and delivered their reports and associated documents to the other program that worked respectively. Afterwards, a part of faculty from both programs visited each other's site focusing on the essential observations of the self-evaluations. In doing so, they played the role of critical friends. The site visits are called cross-sparring visit.

In practice, the duties of the cross-sparring visitors are to recognize good practices but also to identify new potential development targets. After the cross-sparring visits, essential observations are written down on 1 - 2 pages.

The three projects showed clearly that the quality and engagement of the self-evaluation were improved thanks to the expected cross-sparring. All degree programs that participated in these projects have applauded how they learned from the other's solutions and strengths and got valuable development proposals from the critical friends.

Table 1. A list of CDIO Standards.

Objective	**CDIO Standard**
Program philosophy	*1. The Context*
Curriculum development	*2. Learning Outcomes* *3. Integrated Curriculum* *4. Introduction to Profession*
Design-build experiences and workspaces	*5. Design-Implement Experiences* *6. Study Workspaces*
New methods of teaching and learning	*7. Integrated Learning Experiences* *8. Active Learning*
Faculty development	*9. Enhancement of Faculty Competence* *10. Enhancement of Faculty Teaching Competence*
Assessment and evaluation	*11. Learning Assessment* *12. Program Evaluation*

An easy and non-bureaucratic approach of this process and quick feedback were considered positive features compared to a time consuming traditional accreditation process. Especially cross-sparring with international partners validated the effectiveness of the process.

Improving the accuracy of the evaluation was discussed in the projects. The 12 CDIO criteria were considered too few and therefore 16 more evaluation criteria were introduced. The 12 CDIO standards and evaluation criteria are shown in Table 1, followed by a list of the 28 evaluation criteria.

A new extended set of proposed 28 evaluation criteria is listed here:

1. *A holistic view of learning*
2. *Appropriate learning outcomes (developed from required competences)*
3. *An integrated curriculum*
4. *A sound subject foundation*
5. *Active learning approaches*
6. *Appropriate workspaces and equipment*
7. *Personal and interpersonal skills development*
8. *Faculty development (knowledge and teaching)*
9. *Learner assessment (type, level, and amount)*
10. *Degree program evaluation to promote continuous improvement*
11. *Links to employability are made throughout*
12. *Collaborative learning*
13. *Additional support for learning*
14. *Technology to engage students in learning*
15. *Feedback is timely, appropriate and formative*
16. *Research is used in teaching*
17. *Student participation in degree program review and development*
18. *Wider stakeholder input to degree program development*
19. *Student retention and progression is monitored*
20. *Work placements are promoted*
21. *Problem solving opportunities (links to the research process)*
22. *Design projects are integrated throughout the degree program*
23. *Equality, diversity, and equal opportunity considerations are part of the degree program team thinking*
24. *Professional attributes and topical considerations are part of the degree program*
25. *Evidence of educational scholarship by faculty*
26. *Effective communication with students*
27. *Different learning styles are taken account of*
28. *Teaching resources*

Each criterion further holds an articulated rationale describing the content and a rubric for evaluation on a six-level scale. Below, the first criterion is described as an example. The descriptions of all other criteria can be found in the Self-Evaluation Handbook [3].

A Holistic View of Learning embeds a rationale for an effective learning experience requires that the different components of the program are linked together in a meaningful way. That way the student has the potential to gain a complete understanding of the discipline and considers it as potential career option. To achieve this, the program team needs to reflect on the program structure and content to ensure coherence in meeting the program goals.

Table 2. A rubric for a holistic view of learning.

Level	***Description***
5	*The program team continuously improves and develops the process that ensures reflection on the program structure and content to ensure coherence in the meeting of program goals.*
4	*The program team has evidence of the implementation of a process that demonstrates reflection on the program structure and content to ensure coherence in the meeting of program.*
3	*The program team is implementing a process that ensures reflection on the program structure and content to ensure coherence in the meeting of program goals*.
2	*The program team has a plan to implement a process that ensures reflection on the program structure and content to ensure coherence in the meeting of program goals.*
1	*The program team is aware of the need for a program with a structure and content that ensures coherence in the meeting of program goals and content to ensure coherence in the meeting of program.*
0	*There is no reflection on how the program structure and content play a role in meeting the program goals.*

The evaluation approach is based on a general maturity model approach comprising of six levels. Similar maturity models are often used e.g. in software industry where it is called Capability Maturity Model (CMM): Table 3 shows the general structure of such maturity model. As can be seen in Table 3, the general maturity model is highly adaptable to evaluation purposes.

Table 3. General structure of a maturity model.

Level	Description
5	*Continuous improvement and development is evident*
4	*Evidence of implementation and measurement of effectiveness are available*
3	*Implementation is underway*
2	*A plan to implement a change has been produced*
1	*There is an awareness of the need to implement change*
0	*No intention to change*

3. Process of collaborative method

The objective of the collaborative methodology developed and employed in this Erasmus project [3] is to enhance the quality of a higher educational institute's operations. The quality evaluation process is based on the networking collaboration between institutes. The experience and expertise the projects have accumulated, are used to identify best practices in education. The main objective of this project is to develop, refine and maintain a new, innovative methodology for continuous quality assurance processes of the participating institutions. Figure 1 shows an overview of the collaborative evaluation method and the processes used.

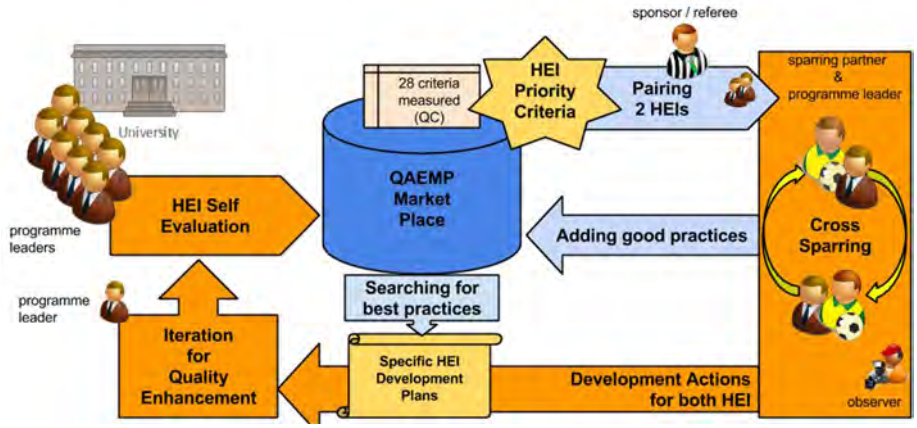

Figure 1. Collaborative evaluation method for Higher Education Institutes [3].

As shown in Figure 1, this collaborative evaluation process consists of the following phases:

- One or many sessions for self-evaluation, based on the framework with 28 rubrics addressed.
- A session of cross-evaluation between a pair of Higher Education Institutes, with the evaluation process conducted between similar or different Degree Programs.
- Only a few of the 28 rubrics are selected to be discussed in the cross-sparring session.
- Potential development items are identified in the evaluation process.
- Teams of experts are formed to help identify the targets in detail.
- Expert teams and workshops contribute to the implementation of the development action.
- The collaboration strengthens the networking impact and provokes effective dissemination of best practices.

Erasmus funded project "Quality Assurance and Enhancement Market Place for Higher Education Institutions" (QAEMarketplace4HEI) was carried out in 2014-16 to develop, implement, and pilot the collaborative evaluation process, first between the project partners and afterwards the collaborative evaluation process has been disseminated in five workshops called "Multiplier events", and organized concurrently in education conferences [4]. This kind of workshop will be offered also in conjunction with the conference of ATICA 2017 and the results are to be compared with the results from other workshops organized in Europe.

4. Discussion

The idea of cross-sparring is seen as a productive way to initiate the development of degree programs. Also, the pairing of partners has great significance. In the cases

carried out during the projects, there were positive combinations of strengths and development areas present. In the optimal case, cross-sparring should not be just a one-timer but should lead to ongoing cooperation. Discussion on how the pairs should be matched continues - in the future it might be beneficial to give the participating institutes an opportunity to describe their preferences based not only on the evaluation criteria, but also on the match of discipline. More experience is needed to create a working market place to fulfil the needs of different programs.

This type of activity can be recommended to any program interested in developing their operations and making their education more attractive. But the method is applicable also at institutional and process level. However, it is important to invest enough effort in the evaluation process from the very beginning. Furthermore, sharing of information and involving students in the process would further increase the attractiveness and focus of higher education.

5. Conclusions

The purpose of quality improvement is to use the resources in the most effective way to advance the attractiveness of higher education. Attractiveness means for example creating an enjoyable time of study, good learning outcomes to enhance the employability for the students, identifying the best place to work with the right type of facilities for the staff and possibilities for continuous development. How well does the process created in the Erasmus project serve this purpose? According to the experience gained here the answer is: “This process is truly worth the effort and thus it would be a great shame if no further possibilities to share it and continuously develop it were forthcoming”.

6. References

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