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198 SUPPORTING PROGRAMME DEVELOPMENT WITH SELF- AND CROSS-EVALUATIONS – RESULTS FROM AN INTERNATIONAL QUALITY ASSURANCE PROJECT

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ABSTRACT

This paper introduces the results from an international quality assurance project 'Quality Assurance in Higher Education Institutes II'. The main goals of the project were to further develop and disseminate the quality assurance methods and tools defined in the first project. The project had six partner universities from five different countries. The project started in summer 2011 and continues until September 2012. The project had three main phases: workshops, self-evaluation, and cross-evaluation. The workshops were supporting pedagogical development, quality assurance and evaluation phases in partner universities. The self-evaluation of the degree programmes described the programs, defined areas of further improvements and provided basis for the cross-evaluations. As a result of the project, new tools and methods of quality assurance were adopted in partnering universities. In addition, the international co-operation in quality assurance and curriculum development was deepened. Finally, the evaluated programmes received direct feedback from the cross-evaluators for their near future development actions.

Keywords: Quality Assurance, CDIO, Self-evaluation, Cross evaluation, Program development, Continuous development.

1 INTRODUCTION

In the field of higher education, international co-operation and comparability of education as well as quality assurance are challenging higher education institutions (HEIs) to find new solutions to monitor and improve the quality of teaching and learning [1-4]. In order to educate the future professionals to meet the competence requirements of working life, the quality assurance processes in higher education needs to be developed further. For example, a survey among teaching professionals in higher education institutions in over 30 European countries

reported that a large majority of respondents acknowledged the need for European quality standards for higher education [5]. Already the Bologna declaration stated that European co-operation in quality assurance should be promoted [6]. The Quality Assurance in Higher Education Institutes I [7, 8] and II projects are answers to these challenges and requirements. The QA in HEI projects responds also to the ENQA-report [9] where a widely shared set of underpinning values, expectations and good practice in relation to quality and its assurance were called.

The CDIO initiative [10], offering an ideal framework for curriculum development and outcome-based assessment, emphasizes also the importance of quality assurance work in HEIs. The CDIO initiative is an innovative educational framework and international collaboration network of engineering educators. The CDIO initiative is built on the 12 CDIO standards [11] and CDIO syllabus. The standards act as guiding principles for design and development of a degree programme. Focusing the development in the areas defined by the standards will lead to better student experience and improved learning results. The 12th standard sets the principle of quality assurance and continuous improvement to the development of a degree programme.

In this paper, we will show how six universities in Northern Europe have worked together to strengthen the quality assurance procedures in their institutes. First we introduce the Quality Assurance in Higher Education Institutes II project. After that the project results will be introduced. Finally, we will discuss our experiences and give conclusions.

2 QUALITY ASSURANCE IN HIGHER EDUCATION INSTITUTES II PROJECT

The Quality Assurance in Higher Education Institutes (QA in HEI) II project continues the work done in the first QA in HEI project [7, 8]. In the first QA in HEI project a new self-evaluation model and a new cross-evaluation model was developed and successfully tested. During the first QA in HEI project, knowledge of the CDIO initiative as a framework for quality assurance increased too although the partners have been in close cooperation since 2007 in the CDIO network.

This new QA in HEI II project started in 2011 and continues until September 2012. The purpose of the project proposal is to enlarge the Nordic network of the previous project (Turku University of Applied Sciences and Helsinki Metropolia University of Applied Sciences from Finland, Royal Institute of Technology from Sweden and Technical University of Denmark) with new partners from Baltic countries: University of Tartu from Estonia and Vilnius University of Applied Sciences from Lithuania. In the QA in HEI II project, the self-evaluation model will be introduced to new programmes and implemented to identify development areas in the curriculum of selected degree programs. Furthermore, the applicability of the self-evaluation model will be tested in a different higher education environment and developed further in a larger Nordic-Baltic network. By introducing a new framework of quality assurance in Baltic partner universities, project also contributes to the comparability of educational quality of HEIs in international level. Cross-evaluation model, developed also in the QA in HEI-project, promotes both self-assessment and international comparability of educational quality. In Nordic-Baltic level, the project aims at strengthening the co-operation of HEIs

in quality assurance of engineering education and to disseminate best practices of quality assurance working methods and educational solutions between HEIs.

The main goal of the project is to disseminate the quality assurance methods and tools developed in Quality Assurance in Higher Education Institutes–project (2010-2011) to new partner universities from Baltic countries and to new programmes in the old partners. In this follow-on project the Nordic partners will act as mentors by guiding new partners through the quality assurance process and familiarizing them with CDIO framework which provides the methodological basis for educational quality assurance. By offering new innovative models and tools, the project promotes the quality assurance work and continuous curriculum development in the field of engineering science in Baltic partner universities, strengthens their commitment to the CDIO framework and the cooperation between Nordic and Baltic partners.

Project had three main phases: 1) Workshops, 2) Self-evaluations and 3) Cross-evaluations. The idea of workshops was to support the evaluation process in programmes that were new to the CDIO initiative and the QA process developed in the first QA in HEI project. The evaluation process had five steps (Table 1).

TABLE 1. *Evaluation steps and outcomes.*

<i>Steps</i>	<i>Outcomes</i>
Create the programme description	- Programme description with necessary appendixes
Make the self-evaluation	- CDIO self-evaluation report - Description of three best practices - Description of the local self-evaluation process
Time for improvement and development	- Action Plan showing the defined and scheduled development step
Preparing for cross-evaluations	- A report of the most important measures that have been implemented since the self-evaluation
Cross-wise evaluations	- The cross-wise evaluation report - A description of the cross-wise evaluation process (and possible suggestions for improvement of the process)

Each partnering HEI performs a self-evaluation process in degree programmes that are selected for this purpose. The self-evaluation process is conducted by following the previously defined self-evaluation process steps [7]. The self-evaluation process is followed by cross-evaluation that is performed pair-wise, pairs consisting of one Baltic and one Nordic partner. The pairs of cross-evaluation are selected by the participating degree programmes and experts from each HEI. The degree programmes are paired off based on the disciplines and the evaluation process is performed again by the cross-evaluator. In order to promote international comparability of education, the cross-evaluation pairs represent different nationalities. The cross evaluation will follow the model developed in earlier QA in HEI project as well. The evaluation will respect the principles of appreciative evaluation. After the cross-evaluation, the results of the evaluation are reported to the evaluation partners. Based on the evaluation report results, the degree programmes refine the feedback to development plans, which define the precise actions for improving the quality of education. Accordingly, the HEIs prepare a development plan that describes the actions that are aimed at improving the educational quality in institutional level.

3 PROJECT PHASES AND RESULTS

3.1 Workshops

The project organized three workshops in pedagogical development and quality assurance:

- Pedagogical CDIO workshop I, 23.11.2011, Tartu
- Self-evaluation and QA workshop, 12.12.2011, Vilnius
- Pedagogical CDIO workshop II, 11.4.2012, Vilnius.

The workshops were defined to provide support for the pedagogical development and quality assurance work. The workshops were delivered by representatives of two project partners: Turku University of Applied Sciences and Royal Institute of Technology. Each workshop had around 15-20 participants. The participants were mainly from the hosting institute but some participants joined from the other project partner institutes as well. The pedagogical workshops contained topics such as CDIO initiative, project-based learning, integrated learning and engaging students in their learning. The quality assurance workshop focused on CDIO standards and the self-evaluation process. Especial focus was on the standard 12 (Program Evaluation), which describes the ideology of self-evaluation.

3.2 Self-evaluations

Four degree programmes (Table 2) joined the self-evaluation process which involved detailed program description and self-evaluation with CDIO tools.

TABLE 2. Degree Programmes in evaluation process.

<i>Degree Programme</i>	<i>Institute</i>
Information Technology	Turku University of Applied Sciences
Software Engineering	Vilnius University of Applied Sciences
Electronics	Helsinki Metropolia University of Applied Sciences
Computer Engineering	University of Tartu

While Royal Institute of Technology and Technical University of Denmark did not have any programmes in evaluation phases their role was to be external observers of the evaluation process. The self-evaluation process of each HEI had some differences, but in each HEI faculty members, students and industry representatives had some role in the evaluation process. The main development actions identified in self-evaluations are shown in the Table 3.

TABLE 3. Identified development actions.

<i>Programme</i>	<i>Development actions</i>
Electronics (Helsinki)	<ul style="list-style-type: none"> - Outcomes need to be processed more - More integration needed to engineering - Faculty co-operation in integrated learning experiences should be improved - More training on active learning - Course assessment will be improved in curriculum process - Need for project facilities - Actions based on the feedback
Computer Engineering (Tartu)	<ul style="list-style-type: none"> - Use of collected feedback data should be improved - Connection with working life and real engineers
Information Technology (Turku)	<ul style="list-style-type: none"> - Learning outcomes require updating and consistency with the program goals - Assessment of integrated learning experiences in lab courses - Introductory design build project is needed. - More flexible space is needed - Engage students more in the programme development - More projects and working life connections
Software Engineering (Vilnius)	<ul style="list-style-type: none"> - Start student participation in program renewal process - Design programmes based on competences and learning outcomes - Improve QA practices with self-evaluation

3.3 Cross-evaluations

In cross-evaluation phase four pair-wise cross-evaluations were done. The cross-evaluations based on the self-evaluation reports and site visits in Tartu, Vilnius, Turku and Helsinki belonged to the process. The site visit focused on program presentation, best practices, workspaces, questions and reflections from evaluators. The observers' feedbacks from the cross-evaluations are listed in the Table 4.

TABLE 4. Observations from the cross-evaluations.

<i>Programme</i>	<i>Impressive experiences and strengths</i>	<i>Challenges and open questions</i>
Computer Engineering (Tartu)	<p>Impressive experiences</p> <ul style="list-style-type: none"> - feedback system; forces the students to give feedback of a number of courses per semester - electronics labs open 24/7 - programme evaluation on consistent basis - the attitude of the programme management: to pedagogical development <p>Strengths</p> <ul style="list-style-type: none"> - teacher to teacher –seminars; even though limited attendance - capstone and first year projects - Introduction to specialty; should it however be compulsory? - the use of student assistants 	<p>Challenges</p> <ul style="list-style-type: none"> - mass courses in mathematics and physics; low level of integration to - professional studies - RDI activities strongly emphasized over teaching among the staff - lack of compulsory industrial work placement during the studies - level of international exchange <p>Open questions</p> <ul style="list-style-type: none"> - formal implementation level and knowledge of CDIO - the level of e-learning - employability of the graduates in Tartu region - level of industry cooperation; both in capstone and final year projects

TABLE 4. Continues.

<i>Programme</i>	<i>Impressive experiences and strengths</i>	<i>Challenges and open questions</i>
Software Engineering (Vilnius)	<p>Impressive experiences</p> <ul style="list-style-type: none"> - Active Working life connections: projects; teachers from industry; reaction to changes in the environment - The procedure to design the curriculum: representatives from industry, students, ...; background research - Course documentation seems to be very informative - The overall accreditation procedure <p>Strengths</p> <ul style="list-style-type: none"> - Final practice usually leads to final project - The curriculum is "accredited" – freedom to change up to 25 % - Keeping up the study group together - International activities - The new e-business program uses CDIO principles quite well - Good employment figures - Quite small groups sizes in labs 	<p>Challenges</p> <ul style="list-style-type: none"> - If you don't pass courses → drop-out - No flexibility with the compulsory courses - Supporting teachers in the change process - Connecting CDIO self-evaluations to strategic and operational planning - How to support individual study paths? How to avoid course chain problems (prerequisites)? - Changing teaching requires changes in assessment <p>Open questions</p> <ul style="list-style-type: none"> - Fee system seems to be complicated, but maybe also motivating - How to support students in their studies – relying on individual teachers' activity - Managing the large amount of part-time teachers? - What is the CDIO implementation plan and the next steps to be taken? - Initiating learning and practicing skills in students groups – students clubs?
Information Technology (Turku)	<p>Impressive experiences</p> <ul style="list-style-type: none"> - Innovation project consolidating different study programs - Easy process of curriculum update - Ability to obtain professional certificates during studies - Awesome Cisco laboratory - Working practice already in the 1st year - Dedicated space for students projects - Perfectly suited premises <p>Strengths</p> <ul style="list-style-type: none"> - High flexibility of study program - Opportunities to participate in real IT projects during studies - All lecturers have pedagogical education - Feedback information from students and industry is used for curriculum development - Free of charge education - System for plagiarism detection - "Girls and technology" marketing activities 	<p>Challenges and open questions</p> <ul style="list-style-type: none"> - Lack of strong motivation for repeated exams - Development of Alumni - Collection of more detailed student career information - Use of second (alternative) technology in some courses

TABLE 4. Continues.

<i>Programme</i>	<i>Impressive experiences and strengths</i>	<i>Challenges and open questions</i>
Electronics (Helsinki)	<p>Impressive experiences</p> <ul style="list-style-type: none"> - The structure of first year studies (including first year engineering project and Introduction to Studies) - Small groups of 40 students - Teachers can enter custom questions to the feedback system <p>Strengths</p> <ul style="list-style-type: none"> - Spacious labs as curricular learning environment - Hands-on labs early in the program (and fuzzy problems) - Twice a year feedback meetings with student representatives - Mandatory 60-credit teacher training - Industry-driven projects - Systematic approach to mapping programme learning objectives with course outcomes 	<p>Challenges</p> <ul style="list-style-type: none"> - How to facilitate independent/group study on school premises? - How to get students to give feedback on courses? - If first year project is moved to 1st semester and implements LEGO, how to preserve current engineering content as design-implement project in year 1? - To have labs accessible for students during weekends? - Continuous faculty development after the initial 60 credits - Getting industry involved in programme development and validation of learning objectives <p>Open questions</p> <ul style="list-style-type: none"> - Are teachers motivated/guided to use the feedback system? - There are several managers for this programme, yet their independent roles are somewhat unclear. - After mapping programme outcomes with course outcomes, what is the plan of utilizing these results? - Actual attitude of the staff towards CDIO?

As the cross-evaluation teams were familiar with the self-evaluation documents prior to the site visits, they could produce a short one-page executive report already at the end of the site visit. In this way, the reporting process became very compact and time-efficient. The evaluated programme analyzed the feedback carefully and made necessary additions and corrections to their own analysis.

4 DISCUSSION

The project reached well the original goals set in the project plan:

- The quality assurance processes in partnering programmes has improved with the implementation of the evaluation process
- Development of the programmes benefited from benchmarking self-evaluation results, best practices and cross-evaluations
- The continuous improvement process with CDIO initiative started/strengthened in the programmes
- The cross-evaluation process fostered co-operation between HEIs in the field of quality assurance work
- The educational quality, comparability and co-operation was promoted among the partner HEIs
- The practices of quality assurance methods applied in the project were shared and disseminated to new HEIs and new programs.

It proved very valuable design that cross-evaluators were from similar programmes. It was easy to find a common language and to go deeper into the program challenges. The international pairing made the evaluation process quite open – we are not competitors rather partner universities trying to help each other in the programme development. The external evaluators provided immediate feedback to programmes. They could also point out areas that were not acknowledged important in the programme earlier.

5 CONCLUSIONS

As result of the project, new tools and methods of quality assurance were adopted in partnering universities. In addition, the international co-operation in the area of quality assurance and curriculum development was deepened. The evaluation process has been successfully tested in two international projects and we can truly recommend this process to new programmes and universities.

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