EXPERIENCES ON COLLABORATIVE QUALITY ENHANCEMENT USING CROSS-SPARRING BETWEEN TWO UNIVERSITIES

Robin Clark, Gareth Thomson

Aston University, Birmingham, UK

Elina Kontio, Janne Roslöf, Paula Steinby

Faculty of Business, ICT and Chemical Engineering,
Turku University of Applied Sciences, Turku, Finland

ABSTRACT

Aston University and Turku University of Applied Sciences (TUAS), together with six other partners, participated in an Erasmus+ funded project aimed at developing a collaborative, comprehensive and accessible evaluation process model for HEIs to use in their Quality Assurance and Enhancement. As a part of the project, the developed model has been piloted by the participating universities. The starting point for these pilots was a self-evaluation exercise inspired by the CDIO self-evaluation model. Whilst completing the self-evaluation, the participants also defined a set of criteria particularly relevant and of interest for the further development of their activities. After the self-evaluation phase, each institution was paired with another institution that provided a best fit concerning the strengths and development areas of the other based on the respective self-evaluation results,. Thereafter, the so called cross-sparring visits took place. In this paper, the experiences of the self-evaluation process as well as of the cross-sparring visits between Aston University and Turku University of Applied Sciences are reported. The process and practical arrangements of the visits are described, and the key findings based on the cross-sparring results are discussed.

KEYWORDS

Quality Assurance, International Collaboration, Faculty Development, Standards: 1, 10, 12

INTRODUCTION

Higher Education Institutions (HEIs) need to continuously improve the quality and efficiency of their operations. This is important not only in order to ensure the best possible education to future generations of professionals but also to be able to use the scarce resources in an optimal way. Topics connected to quality assurance have been widely discussed in the literature (see, eg., Van Der Wende and Westerheijden (2001) and Amaral & Rosa (2010)), while the CDIO initiative also underlines the importance of continuous development. Under CDIO, each HEI should have proper processes for evaluating its programs to determine their effectiveness and efficiency in reaching the intended goals and, thus, serve as the basis of continuous program improvement (CDIO, 2015).

Aston University and Turku University of Applied Sciences, together with six other partners (all CDIO member institutions), have participated in an Erasmus+ funded project called QAEMarketPlace4HEI (http://projects.au.dk/cross-sparring/) aimed at developing a collaborative, comprehensive and accessible evaluation process model for HEIs to use in their Quality Assurance and Quality Enhancement work. The project has promoted cooperation in quality assurance through the design and piloting of a new kind of continuous, accessible, cooperation based model supporting so called cross-sparring between the institutions. The project and its goals have been previously reported by Bennedsen, Clark, Rouvrais & Schrey-Niemenmaa (2015) and Clark et al. (2015).

As a part of the project, the developed model has been piloted by the participating partner universities. The starting point for these pilots was a self-evaluation exercise inspired by the CDIO model with participants ranking their current level of maturity over a range of 28 criteria covering a range of learning and teaching themes such as the use of technology in programmes, links to employability and the development of faculty competence. Whilst completing the self-evaluation, the participants also identified which criteria were particularly relevant and of interest for the further development of their activities. After the self-evaluation phase, each institution was paired with another based on the self-evaluation results, to provide a best fit concerning the strengths and development areas of the other. Thereafter, the so called cross-sparring visits took place. Cross-sparring is a process that makes feedback collaborative, concrete and objective. The sparring partners focus on the objectives, learn from the experiences of others and engage in reflection. The aim of the approach is to benefit both the institution evaluated, which will get a more objective view on its strengths and potential improvement areas, and for the sparring partner which may identify best practices that can be useful for their own institution.

This paper will explore the experiences of the self-evaluation process as well as of the cross-sparring visits between Aston University and Turku University of Applied Sciences. The process and practical arrangements of the visits are described, and the key findings based on the cross-sparring results are discussed. The structure of the paper is as follows: After this section the developed self-evaluation and cross-sparring methods are described in more detail. The next two sections include descriptions of the cross-sparring visits, experiences on the pilot, and the main findings by TUAS and Aston University participants respectively. Finally, the joint conclusions are reported and results discussed.

ON THE SELF-EVALUATION AND CROSS-SPARRING PROCESSES

In Higher Education today, institutions 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 this is what is most closely linked to the measures identified by institutions to ensure a high level and consistency in tertiary learning provision. Quality enhancement is often identified in bespoke projects or left to the enthusiasm and energy of programme teams and individual teachers.

The QAEMarketPlace4HEI project has been designed to bring the QA and QE elements of Higher Education activity together into one process. The objective behind the project is to develop an approach that when applied ensures the satisfaction of the QA requirements but at the same time actively promotes a culture that identifies enhancement opportunities for modules and programmes. The specific focus has been on programmes that use or aspire to

use active learning as a key pedagogical element of their Higher Education provision (Kontio et al, 2015).

The starting point for the process, as already identified, is the Self-Evaluation exercise. Across the globe, Higher Education quality assurance systems invariably start with some form of reflective exercise where programme teams are invited to consider the features of programmes and to record this reflective thinking in some form. In some systems this is in the form of a narrative often referred to as a Self-Assessment Document. This can be an onerous exercise as the open ended nature of the document guidelines can lead to lengthy documents in which teams try to include as much about the programme as possible. This potential lack of focus was acknowledged by the CDIO community at its inception and addressed through the development of a self-evaluation tool that is based on identifying the most appropriate statement relating to the evaluation of a particular criterion. This approach is based on levels of maturity, higher numbers indicating more mature thinking and action in addressing the criterion.

The CDIO approach to self-evaluation was taken as the basis for the process. The criteria list had to be expanded in order to consider the wider considerations of a full QA exercise, hence the 12 CDIO criteria was expanded to 28 criteria following an iterative exercise that took into account several different QA systems from across the globe. The detail of this process has been reported by Bennedsen, Clark, Rouvrais & Schrey-Niemenmaa (2015) and Clark et al. (2015). Despite the iterative nature of the exercise adopted at the self-evaluation generation stage of the project, the project team always anticipated that the criteria and the wording used to describe the different levels of maturity would need to be revisited at the conclusion of the cross-sparring process. The self-evaluation process also requires participants to identify examples of activity that can be used to justify the maturity level value attributed to a programme. This was a conscious decision to request this, even though it added a little to the requirements of the self-evaluation process, as then the MarketPlace, into which the self-evaluation data is fed, could then become a repository of ideas and examples to both ensure consistency in the level identification, but to also stimulate ideas.

Once a self-evaluation has been conducted it can be entered into the MarketPlace software platform and used as the basis for a pairing with a partner institution. Each institution is able to identify the criteria it wants to be paired against. For the pilot phase of the project it was decided to pair institutions based on 4 selected criteria. Generally the pairing related to criteria where institutions wanted to develop ideas for improvement. This meant that the criteria would pair institutions where there was some form of gap between their performance as identified by the self-evaluation scores. The output of this phase of the project is the identification of the cross-sparring pairs.

The next stage requires the paired institutions to prepare for a two day visit from their partner institution. For the pairing being discussed in this paper, 3 representatives of TUAS visited Aston first and then around 3 weeks later, 2 representatives of Aston visited TUAS. The preparation required the identification of an agenda with each institution using the chosen key criteria as the basis for discussions, presentations, demonstrations and any other activity deemed relevant. After each visit the participants completed a ‘visit report’ identifying the key features and learning from the experience. From a methodological viewpoint, each pairing (4 in all) can be considered as a discrete case study. Each has the opportunity to offer ideas and findings related to that particular partnership. In addition, looking across all of the case studies offers the project team an opportunity to explore common themes around QA and QE in Higher Education as well as to offer insight into the value and efficiency of the process.

This is important for the project as the team work towards the development of a tool and process that can see wider use across the sector.

TUAS EXPERIENCES – AND VISIT TO ASTON

The TUAS participant was the ICT Unit that is one of the departments of the Faculty of Business, ICT and Chemical Engineering. The cross-sparring activity was started according to the defined process by filling the introductory documents and completing the self-evaluation. The self-evaluation activity was performed by the unit management team during a dedicated workshop in spring 2015. The team members (leaders of the education teams and research groups) had studied the evaluation matrix and instructions prior to the meeting and, thereafter each evaluation item was jointly discussed and rated. All the unit's teams had also completed a standard CDIO self-evaluation before this workshop as a part of the unit's annual planning process. Therefore the results and findings of the CDIO self-evaluation were available when this extended evaluation phase was conducted.

In general, the self-evaluation was found straightforward and easy to complete. One reason for this could be the fact that the faculty has used the CDIO self-evaluation as a tool to support the continuous development process for several years. Moreover, the unit had just completed an extensive self-evaluation activity connected to the Finnish national quality audit process. Most of the evaluation items were clear and it was easy to position the unit's maturity level but some of the items were found overlapping and certain rubrics partly unclear. This feedback was reported back to the project and will be addressed.

The self-evaluation included a task to determine a set of so called priority criteria that were found especially important to the development of the unit. These criteria were the following:

- Faculty development
- Technology to engage students in learning
- Equality, diversity and equal opportunity considerations
- Different learning styles are taken account of

Although the self-evaluation was completed on the ICT Unit level, the specific programme participating in the evaluation and cross-sparring process was the BEng degree programme in Information and Communications Technology. This program has an annual intake of 200 students (including an international programme taught completely in English). The extent of the program is four years (240 ECTS credits), and the current competence tracks (or major subjects) are Electronics and Telecommunications, Data Networks and Information Security, Embedded Software, Game Development, and Health Informatics. The program was inspired by the CDIO initiative and has been active for almost ten years.

Cross-sparring visit to Aston University

The TUAS programme was paired with Aston University based on both institutions' self-evaluation results and documentation. More specifically, the cross-sparring partner was defined to be the Mechanical Engineering and Design programme at Aston University. Also this program has utilised the CDIO model in its development for a significant time already which provided a nice platform for mutual discussions.

The cross-sparring activity was initiated by filling out the institution descriptions and exchanging other materials that guided both partners in preparing for the visit. The agenda of the visit was planned jointly based on the defined priority criteria of both partners. TUAS's visit to Aston University was scheduled for December 1-2, 2015. The TUAS visit team consisted of three members of the ICT Unit's management team: Elina Kontio (Research Group Leader, eHealth Technologies), Paula Steinby (Programme Leader, ICT BEng Basic Studies), and Janne Roslöf (Head of the Unit). The hosts of the visit were Robin Clark (Associate Dean for Learning and Teaching) and Gareth Thomson (Head of Mechanical Engineering and Design).

The visit agenda included general presentations on the UK educational system, Aston University in general, and the Mechanical Engineering program in particular. The curricula and different project-based learning opportunities were widely discussed. The recently updated active learning workshop facilities were visited (see Figure 1). Certain parts of the agenda were tailored based on the TUAS priority criteria. The TUAS team had the opportunity to discuss, for example, with Aston's specialists in student experience creation, and got familiar with different technologies utilized to support the learning process.

Lots of time was reserved for mutual discussions on topics arising during the presentations and visits. This was found to be very fruitful and helped to create a productive atmosphere – not to forget the continued discussions during a joint dinner. The visit was concluded by filling the first versions of the memos using the predefined templates. The templates were found unnecessarily complex, and they could be made simpler and more usable, another piece of feedback to the project team for action.

Figure 1. Visiting Aston's CDIO learning environment (from the left: Robin Clark, Gareth Thomson, Paula Steinby and Elina Kontio) and getting familiar with the students' projects.

Experiences and findings

The presentations and discussions during the visit were found very fruitful and useful for the future development of TUAS and the participating degree program. The program of the visit

was well prepared and provided information from several different perspectives. Also the connection to the selected priority criteria was considered. Furthermore, the fact that the cross-sparring partner represented another field of engineering was found positive even though the TUAS team was hesitant at first as it helped ensure the focus remained on the processes and the priority criteria relating to learning and teaching rather than on the disciplinary content.

The main findings connected to the improvement of the programme were as follows:

- Different technologies to enhance learning and teaching could be utilized more at TUAS. Aston's platforms are more developed concerning, for example, the possibilities to record and share learning sessions. Also the AstonApp concept was found interesting.

- Aston's tradition and processes to consider equality and diversity issues are more mature than at TUAS. It seems that we are just starting to learn about these topics which have been present at Aston for a long time already.

- Faculty development was selected as one of the priority criteria by the both partners. The challenges connected to it were widely discussed during the visit. There are certain practices and faculty training opportunities in both institutions but still there seems to be a need for development. For example, there could be room for a common development project initiative.

The final phase of the cross-sparring activity was to identify potential best practices to be published on the open QA MarketPlace developed by the project. Based on the cross-sparring visit, the TUAS team proposed the inclusion of the following Aston practices:

- The newly updated "CDIO workspace" and the courses and practices connected to it can clearly be considered as a best practice in both learning environment design and active learning development. The concept could serve as a reference model to institutions planning to improve their activities in this area.
- Connected to the courses utilising the CDIO workspace, also some practical innovations valuable to TUAS were identified. For example, the usage of videos as a project reporting tool as well as the "GANTT-chart-like" project progress visualisation method which will be adopted.
- Aston's Learning Development Centre that focuses on helping the students with all aspects of academic skills could be a best practice. If its operations were understood correctly, it could be a very interesting practice to benchmark to TUAS and for many other institutions as well. Unfortunately, there was not enough time to focus more on this centre during the visit.
- The practices connected to student experience creation and consideration of diversity and multicultural aspects could be defined as a best practice as well. However, it is difficult to describe and conceptualise these activities in this context. Maybe it is partly a cultural topic to, and not only a practice that can be described and adopted in the traditional way. Also, it may be difficult for the TUAS team to determine whether Aston's way of handling these topics is a best practice on a wider arena – or does our experience more reflect the immaturity of TUAS in this field?

ASTON'S EXPERIENCES – AND VISIT TO TUAS

The Aston participant in the cross-sparring project was the Mechanical Engineering & Design (MED) subject group, which sits within the School of Engineering & Applied Science at the University. This group runs three year long, Bachelor and four year long, Masters undergraduate degrees in disciplines allied to Mechanical Engineering and Product Design. While the Product Design and Mechanical Engineering degrees have around 50% commonality, for the purposes of the cross-sparring, the Mechanical Engineering family of degrees were chosen as the focus of the work. Around 110 students embark on these Mechanical Engineering programs each year with joint classes of up to 140 when taught together with the Product Design students.

The subject group has been an active member of the CDIO initiative since 2010 and its standards have very much shaped the nature of the degrees run by MED. A further key driver for the engineering degrees run by the group is the necessity for these to be accredited by the UK's Institution of Mechanical Engineers, allowing graduates to progress to professional registration once in employment.

The self-evaluation was carried out as a discussion between the School's Associate Dean for Learning & Teaching and the Head of Group of Mechanical Engineering & Design, both having first made themselves familiar with the evaluation matrix and formulated draft evaluations. In general the process was relatively straightforward however for some criteria there was some difficulty in relation to determining the appropriate rating. Typically for each sparring criteria a rating of 3 indicated the criteria was being considered and activities were in place to address this, 4 related to evidence of impact and 5 had the programme team reflecting on their actions with an aim of continuous improvement. For many of the criteria, while there was continuous reflection and improvement, having hard "evidence" – as opposed to anecdotal or experiential information, was seen as problematic. This is perhaps a reflection of the need within the MED group to be more systematic with its evaluation of the activities, however it also highlights the difficulty in determining a pragmatic definition of evidence with regard to the self-evaluation.

Of the 28 criteria set, those considered by the Aston team to be where there was both a low ranked self-evaluation and where it was felt improvement would have significant strategic benefits were identified. These criteria were as follows:

- Faculty development (knowledge and teaching)
- Links to employability are made throughout
- Feedback is timely, appropriate and formative
- Student participation in program review and development

Cross-sparring visit to TUAS

As discussed previously Aston's Mechanical Engineering programs had been paired with the ICT programme at TUAS. In addition to the cross-sparring criteria there was both commonality in terms of involvement in CDIO and similar intake cohort sizes but also contrasts in terms of subject discipline and national contexts. Attending from Aston were Robin Clark and Gareth Thomson, with Janne Roslöf and Paula Steinby acting as hosts at TUAS. This mirrored the roles from the visit to Aston two weeks earlier.

The agenda for the visit had been loosely defined prior to the visit of TUAS to Aston however was such that adjustments could readily be made based on the experiences of both parties following the UK visit. The programme began with a general presentation of the Finnish Higher education system to help set context and highlight any local constraints before the agenda moved quickly to the cross-sparring criteria.

Specific target criteria included student participation in program review and development. To support this, the panel were joined by two student representatives from the TUAS ICT program who took part in an interesting and open discussion on how they saw their role in the management process within the department. The Aston team were also shown TUAS's approach to employability, particularly with regard to entrepreneurship. This included a visit to the internal student run consultancy company allowing students to gain access to and experience on small scale commercial ICT projects. This was followed by a visit to the adjacent SparkUp incubator unit run by the local science park to encourage start-up businesses, which commonly had ICT graduates at their heart.

Experiences and findings

The visits, both of the TUAS team to Aston and the UK team's trip to Finland were found to be extremely productive and while there are no immediate answers to fully address the criteria marked for development, a pathway has begun to be forged. There were a range of findings based on TUAS ICT experiences which could form the basis of improvements to the Mechanical Engineering programs at Aston.

- TUAS, while having similar cohort sizes to Aston, had a novel method of structuring these with cohorts typically broken down into a number of parallel classes of around 30 students. Each class would have at least one class rep and the small class sizes appeared to create a more collegiate relationship between students and staff.
- TUAS has a more developed approach to employability, industrial involvement and entrepreneurship than MED at Aston. The development of a student consultancy, something which also exists in Aston's own ICT group, while perhaps not directly replicable can act as inspiration for the development of entrepreneurship activity.
- Final year projects were all industrially linked and this was seen to be a key cornerstone of the TUAS ICT degree philosophy.
- Faculty development was seen as an area which both groups were keen to explore further and it was felt that this could offer opportunities for future collaboration.

A number of best practices at TUAS were identified which might be transferrable: elsewhere and not just to Aston:

- While independent from the ICT group at Turku, the adjacent location of the SparkUp facility together with a pipe stream of graduates and undergraduates entering this must be seen as best practice. Key however to this is the internal ICT company "the FIRM" which gives students early experience of, and confidence in, undertaking commercial work. In so doing this acts as a primer and breaker of barriers for students developing both entrepreneurial and more conventional industrial careers.
- The informal and close relationship with students was seen as very good practice, with opportunities to discuss issues on an informal basis with both the class teachers and the Dean seen as highly positive.

- The TUAS group also encouraged multi-disciplinary co-operation in projects and this must also be seen as best and industry reflecting practice.

CONLUSIONS

In this paper, the experiences of the self-evaluation process as well as of the cross-sparring visits between Aston University and Turku University of Applied Sciences have been presented and discussed. In general, the process was found positive by the both partners, and fruitful discussions took place during the different phases of the pilot. The cross-sparring helped to identify development areas and to find improvement ideas connected to topics in diversity, student employability and project-based learning methods, for example.

The piloted self-evaluation and cross-sparring processes were found rather well-functioning. Also the practical arrangements were successful, and the visit programs supported the defined priority criteria of the both partners. Yet, it would have been beneficial to include even more people to the process especially during the visits. The fact that the participating programs represented different fields of engineering was found to be an important element in keeping the desired focus during the visits. On the other hand, the instructions and templates used in the evaluation and review could still be improved in terms of simplicity and usability.

This type of activity can be recommended to any programs interested in developing their operations. However, it is important to invest enough effort in the process from the very beginning. Also the pairing of the partners has a great significance. In this case, there was a nice combination of strengths and development areas present. In the optimal case, the cross-sparring should not just be a “one hit” but lead to an ongoing cooperation in the future.

ACKNOWLEDGEMENT

This work has been funded with support from the European Commission in the context of the 2014-2016 Erasmus+ QAEMP (Key Action2, cooperation, innovation and the exchange of good practices). This paper reflects only the views of the authors. The Commission is not responsible for any use that may be made of the information contained therein. More information on the QAEMP project can be found at www.cross-sparring.eu.

REFERENCES

Amaral, A., & Rosa M.J. (2010). Recent Trends in Quality Assurance, *Quality in Higher Education*, 16, pp. 59-61.

Bennedsen, J., Clark, R., Rouvrais, S., & Schrey-Niemenmaa, K. (2015). Using Accreditation Criteria for Collaborative Quality Enhancement, Proceedings of the 2015 World Engineering Forum, Florence, Italy.

CDIO (2015). *CDIO Standards 2.0*, available online at www.cdio.fi (accessed Jan 8, 2016).

Clark, R., Bennedsen, J., Rouvrais, S., Kontio, J., Heikkinen, K., Georgsson, F., Mathiasdottir, A., Soemundsdottir, I., Karhu, M., Schrey-Niemenmaa, K., & Hermon, P. (2015). Developing a robust Self Evaluation Framework for Active Learning: The First Stage of an ERASMUS+ Project (QAEMarketPlace4HEI), *Proceedings of the 43rd Annual SEFI Conference*, Orléans, France.

Kontio, J, Heikkinen, K, Georgsson, F, Bennedsen, J, Clark, R, Matthiasdottir, A, Hermon, P, Rouvrais, S and Karhu, M (2015), QA and Enhancement Marketplace for HEIs – An ERASMUS+ Project, 11th International CDIO Conference, June, Chengdu, China.

Van Der Wende, M.C., & Westerheijden, D.F. (2001). International Aspects of Quality Assurance with a Special Focus on European Higher Education, *Quality in Higher Education*, 7, pp. 233-245.

BIOGRAPHICAL INFORMATION

Robin Clark is currently Professor of Engineering Education and Associate Dean for Learning and Teaching in the School of Engineering and Applied Science at Aston University. A Chartered Engineer, Robin spent 14 years in industry before joining Aston in 2003. Robin is a National Teaching Fellow and heads Aston´s newly established STEM Education Centre. He leads the UK and Ireland Engineering Education Network and is on the Board of Directors of SEFI (the European Engineering Education Society).

Elina Kontio is a Doctor of Sciences in Health Sciences. She received the M.Sc in Nursing Science (2003) from University of Turku, Finland and is a registered Nurse. At the moment she is a Research Group Leader of eHealth Technologies and a Principal Lecturer in the Faculty of Business, ICT, and Chemical Engineering at the Turku University of Applied Sciences. Her primary areas of interest includes eHealth, Health Informatics and decision-making in hospitals.

Janne Roslöf is a Head of Education and Research (ICT) at Turku University of Applied Sciences. He holds a D.Sc. in Process Systems Engineering and a M.Sc. in Chemical Engineering from Åbo Akademi University (Finland), and a M.A. in Education Science from University of Turku (Finland). He has participated in several national and international educational development assignments. Currently, he is a member of the national engineering education working group of the Rectors' Conference of Finnish Universities of Applied Sciences, as well as the coordinator of its ICT Engineering core group.

Paula Steinby is a Programme Leader (ICT) and a senior lecturer at Turku University of Applied Sciences (TUAS). She has a Licentiate's degree in Mathematics for IT (2003) and a Subject Teacher qualification in Mathematics and Computer Science (2007). She has experience in teaching both higher and upper secondary level students. Her interests include various aspects of facilitated learning and the impact of ICT and communication in learning processes.

Gareth Thomson is the Head of Group of Mechanical Engineering & Design at Aston University and also acts as programme director for the University's suite of undergraduate Mechanical Engineering degrees. He is a Senior Fellow of the Higher Education Academy and holds a PhD in Laser based Materials Processing from the University of Dundee.

Corresponding author

Dr. Janne Roslöf
Turku University of Applied Sciences
Joukahaisenkatu 3 C
FI-20520 TURKU, Finland
janne.roslof@turkuamk.fi

This work is licensed under a Creative Commons Attribution-NonCommercial-NoDerivs 3.0 Unported License.