



NETWORKING OPPORTUNITIES AND CHALLENGES IN DEVELOPING TEACHING AND COUNSELLING IN EE

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Abstract: This paper analyzes networking opportunities and challenges in OTE project. OTE aims to develop teaching and counselling in engineering education. It is a project of ten partners from universities and polytechnics in Finland. The starting point of OTE networking is the belief that collaboration and sharing good practices brings added value to development activities. Networking is done through working groups whose task is to share know-how and develop practices. The analysis of the networking is conducted using SWOT analysis as a framework. The analysis shows that most of the possible disadvantages arise from the number of people and organisations involved in the project. It is also an advantage if the problems it may cause can be overcome. Four themes arise from the analysis.

Responsibility and commitment: The commitment of individuals working in the project as well as of the management of the HEIs is crucial. Commitment is increased by sharing responsibility, and defining and making visible the objectives of the project and motivation of each partner and individual for all organisations and individuals involved in the project. Well defined objectives also help coordinate the project activities and ensure that resources are used for contributing to project activities to reach the agreed goals.

Project management and coordination: Good communication is essential in ensuring that the activities of partner organisations are in line with each other and project goals. The varying size of the participating organisations can cause challenges to coordination and communication.

Sharing good practices: Sharing and developing good practices is central in the OTE project. A working group can be effective in sharing practices and know-how because tacit knowledge is more easily shared while working together. The working group also provides access to information that organizations hold. Practices are also shared between teachers outside the working groups.

Future cooperation: Focus of networking is between individuals, not between organisations. Cooperation increases understanding on the different modes of action of universities and polytechnics and creates grounding for future cooperation.

Keywords: engineering education, higher education, networking

1. Introduction



In Finland extended study times and increasing student dropout rate are typical challenges in engineering education. Students in universities complete a five year master's degree (to which all students enrol) in engineering on average in seven years [1]. Only about half of enrolled students complete their studies in polytechnics [2].

The goal of the OTE-project is to improve teaching and tutoring in selected stages of studies in order to support students to complete their studies in due time. Five universities and five polytechnics are cooperating in the project. The project is described more in detail in the paper "Diversity is a Necessity" [3] submitted to the SEFI conference 2010.

Unique in the project is that it networks the higher education institutions (HEI) of engineering education nationally and therefore widens cooperation in the field. It is common that HEIs cooperate mostly either on regional basis or based on the type of institution so that universities are working with universities and polytechnics with their peers.

In this paper we make a critical review on the mode of cooperation of the network. We analyse the opportunities and challenges of networking in the project. The method and framework used for the review is SWOT analysis. We also make some suggestions on lessons learned from the analysis.

2. Networking in OTE project

Project's target group is defined to be teaching and guidance staff of the institutions. Key themes of the project include:

- Development of tutoring for early stage studies
- Thesis tutoring
- Syllabus development and identification of bottlenecks
- Competence based curriculum development and specification of learning outcomes
- How to integrate teaching of learning skills into course contents. Taking into account the diversity of learners
- National ways of action in learning beyond geographical borders and flexible ways of finishing degrees while in work

The form of cooperation in the project is networking through theme groups. Aalto University has the role of initiator and coordinator and each university is responsible for one theme group. All partners chose 1 - 2 themes on which they would be working in the project based on their own needs. There are approximately 50 people working part or full time in the ten HEIs.

A working group, or as here called a theme group, consists of representatives of 3 - 8 partner organisations. Sharing know-how and developing practices in cooperation are the main tasks for the groups. The groups work independently of each other, however they share their ideas and practices in the project meetings held four times a year. Each theme group has defined objectives and a plan of action according to



the needs of the participating HEIs. Each theme group meets monthly, either face-to-face or virtually using web conferencing. All members of the theme groups have their own collaboratively agreed responsibilities for subtasks.

To coordinate the activities of the network the project steering group that has one representative from each partner organisation. Its tasks include preparation of the project meetings, planning of communication and agreeing on activities that are common to the whole project. The project group in itself is preparatory and the execution of decisions is task of the project manager. Having representatives from all participating organisations there is stronger commitment to the decisions made by the project group.

3. Analysis of the network in OTE project

In this section we aim to analyze the mode of working in OTE from two aspects: the model for working in the project and nationwide cooperation of universities and polytechnics. The method for analysis is SWOT worked out by the project staff.

The starting point of OTE networking is the strong belief that collaboration and sharing good practices brings added value to development activities for teaching and learning.

SWOT analysis (table 1) summarizes briefly pros and cons of the networking approach of OTE project.

Table 1. SWOT analysis of networking in OTE project

Strengths	Weaknesses
<ul style="list-style-type: none">- Shared responsibility- The wide range of people with different backgrounds brings in expertise- Mutual learning- Distribution of good practices	<ul style="list-style-type: none">- The level of commitment varies- Variations in administration in universities and polytechnics challenges coordination- Networking is done between individuals, not between organisations
Opportunities	Threats
<ul style="list-style-type: none">- Creation of new ideas is diverse- Creates grounding for future cooperation of universities and polytechnics in engineering education	<ul style="list-style-type: none">- Fragmentation makes it difficult to recognise problems early enough to reset the direction- Violation of agreement- Funding is allocated to develop own activities, not for contributing to project activities to reach the agreed goals

3.1 Responsibility and commitment

One of the strengths in the project is that the coordination responsibility for different themes is allocated to different partners. Thus the responsibility of the whole project is shared and commitment to the project is increased. As some HEIs joined the



project later they may have had difficulties in getting on the same line in cooperation. This can be one reason behind the varying level of commitment.

All partners are naturally committed to the project on organisational level as they have signed the agreement. In addition to organisational commitment the commitment of individuals involved is needed. Without personal commitment of individuals some themes in the project may remain underdeveloped: all obligations may be fulfilled, however no major improvement occurs. The same applies to managers of HEIs whose support is crucial in implementing organisational practices.

To increase commitment further the objectives of the project should be clearly defined and made visible not only to each participating organisation but also to each individual involved. Motivation is a multilevel phenomenon. Making visible to all the goals and motivation of both the participating organisations and each participating individual e.g. in a project session in early stage of the project improves general understanding. Sharing knowledge explicitly may help all actors to understand not only themselves but also others. With well defined objectives each partner can see what can be achieved in the project. Goals can also be used to measure how successful the project has been as they explicitly show which objectives have been attained and which still need working.

The objectives of OTE project are defined in the plan of action on general level but not on organisational level. It would have been useful to decide which practices will be implemented in which partner organisation and what is the timetable for that. The challenge in defining the goals of the project is that development of teaching operates sometimes on abstract and conceptual level, like changing thinking and sharing knowledge and good practices. Results of such kind of work may be indirect and difficult to measure.

More specific goals definition could help minimise the risk that a participating organisation concentrates on developing its own local specific practices lacking the aspect of exploitation and therefore lacking the commitment to mutual objectives. In that case the advantage of networking could be lost.

Naturally some room needs to be left for innovativeness; however without specific goals it is more difficult to manage a project that has so many partners and themes. Taking the tight timeframe into account there is a risk that problems are not recognized early enough to reset the direction if the objectives are too vague.

3.2 Project management and coordination

Good project management has shown its importance in a project of ten partners. OTE project is funded by European Social Fund which requires careful and detailed follow-up and reporting. The differences of partner organisations administrative practices cause further challenges and extra work to the management of the project. In OTE these challenges have been overcome with precise and simplistic instructions on reporting and administration. As there is little need to make corrections there are more resources available to actual project activities.



The activities of the theme groups need coordinating even though each group has a chair person responsible for the activities. On the project level this task is allocated to the project manager and the project group has an assisting role. The importance of good communication cannot be overemphasized. There are quite a number of people involved in the project and therefore communication inside and also between working groups is essential. Without good communication there is a risk that the activities of partner organisations are not in line with each other and project goals. Again we may lose advantages of cooperation and networking. A worst case scenario is violation of agreement.

Another challenge is varying size of the participating organisations. Some of the partners are small faculties with close contacts between different actors, small target group and lean administrative structure. Some partners like Aalto University are relatively large and inevitably rather hierarchical. Challenges for communication and reaching target groups and actors are naturally higher. In such kind of organisations distance between management and the actors is always much bigger.

Good communication being emphasized, an important question is who has access to which information. In an era of information overload not all information concerning the project can be sent to each and every person. To avoid overloading, people having different roles receive different information in OTE. This can however lead to a situation where some piece of information necessary to a single person is not easily available. An e-learning environment has been used as a knowledge repository to gather all necessary information in one place. The huge variety and amount of different working and social networking environments most of the people are members of cause nowadays challenges to individual working environments. Are they attractive enough, and are necessary information flows connected closely enough to the everyday communication of each individual? This is also a challenge with OTE environment: usage is not very active and therefore new information and documents can easily go unnoticed.

3.3 Sharing of good practices

Sharing and developing good practices is the central activity of the OTE project. A good practice is defined in the project to be an efficient way to achieve some predefined goal and preferably there is evidence to back up the claims of effectiveness. The success of sharing these practices varies. Existing and proven practices such as the good practice of specifying learning outcomes have been most widely implemented in the participating HEIs. In contrast it is hard to assess the success of sharing practices that are being developed in the project as the practices are still in developing phase and there is not yet much evidence of their effectiveness.

The success of sharing can be viewed from knowledge management perspective as well. There are both explicit and tacit knowledge associated with a practice. A common reason why sharing of good practices fails is underestimating the role of tacit knowledge and relying solely on explicit knowledge [4]. Practices cannot be directly transferred from one organisation to another but need to be adapted to the new environment.



A working group can be effective in sharing practices and know-how because the working group members have an opportunity to share tacit knowledge associated with practices while working together on the shared goals. The working group also provides access to information that organizations hold. Sharing knowledge requires trust, and in addition tacit knowledge requires also close communication. Therefore if the relationship between people is arduous, sharing can become difficult [5]. An important question is that do the members of a working group trust each other enough so that they can openly share and learn from others. If they do not, it can lead to knowledge hoarding which makes cooperation difficult.

It is also interesting to monitor whether tacit knowledge plays more important role in the practices still being developed. If it is so, that could explain why they are not shared so effectively. Practices that existed and have been disseminated to some extent already before the project can be more product-like and tacit knowledge plays a lesser role. Naturally there is also more time to share them during the project as they already exist.

Aside working groups sharing of good practices is mostly done between teachers. On organisational level there has been less capability in implementing practices from partner organisations even though perceived useful. Reasons for this can originate e.g. in organisational changes. Aalto University serves as an example: Aalto was established 2010 as a merger of three universities and reorganisation is still going on. Therefore it was decided to not to implement some of the highly rated tools and practices, yet. Other influencing factors include national educational policies and organisational decisions made well before the project started which set priorities to activities on organisational level. 2-3 years project timeline may be very short from higher education institute yearly planning and implementation procedures perspective.

3.4 Grounding for future cooperation

In Finland, cooperation between different higher education institutes is highly recognised by the authorities. Potential for this cooperation increases following the improved understanding of different profiles of universities and polytechnics and of their different modes of actions. Cooperation may also strengthen the profiles and decrease unnecessary competition. University education is based on research and polytechnics offer work-related education in response to labour market needs. One of the qualification requirements of teachers in polytechnics is strong background in industry, and most have a master's degree in engineering from a university of technology. Therefore by nature there are strong ties between different institutes in the dual mode structure.

As already touched earlier, it is common that in projects similar to OTE the focus of networking is between individuals, not between organisations. Although this can be seen as a weakness, it should be kept in mind that deeper strategic cooperation on the organisational level is not even an objective in this project. The project creates grounding for future cooperation as the HEIs and people working in the project get to know each other better. This opportunity could be lost if individuals do not see their



roles as catalysts for cooperation. Cooperation and close collaboration between individuals in project can also be seen as strength. Developing teaching requires strong internal flame. Dictation rarely fires the passion, therefore individuals and their motivation is crucial. Individuals inspire each other and tie their networks together in the new context, and in its best a good project generates new innovative seeds for both developing teaching and learning and for future collaboration.

4. Conclusion

Nationwide network brings many opportunities to share good teaching practices. Networking is also a challenge. Well defined objectives are means to assess the results of the project and its impact on education development. They also facilitate communication both inside and outside the project. Well defined objectives enable open interaction between actors of the project and can thus be seen as a prerequisite for collaboration.

The challenge of the work of the project is how the results are exploited already during the project but especially after the project is finished. To ensure the impact of the project it is necessary to discuss throughout the project where, how, and to whom the results are communicated. Experience from OTE project has taught us that systematic activities aimed at the target group, such as seminars and workshops, should be arranged to make the project well-known and thus increase the impact of the development activities.

The starting point of OTE project is that change agents of the organization are the teachers, who are responsible for the practices. Their motivation and interest is the base for the change. On the other hand, support of the management for this grassroots level work is critical. Experiences from previous projects show that exploitation of the results depends also on how committed are the decision-makers of the partner organisations. Also policy level discussion is needed. This is one of the reasons why OTE project will arrange a discussion session for representatives of professional associations, student associations, companies and management of HEIs.

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