

Case studies from piloting

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ANNEX A Case study questions

1 Introduction

This case study report is part of the RADICAL-project reporting. Objectives of the RADICAL project is closing the skills gaps between the demands of working life and higher-level vocational education and training. The project work is mainly done by Turku University of Applied Science (TUAS) in close cooperation with the leading Blue Industry enterprise, Meyer Turku Oy (Ltd.), its network partners in Hannover, Aschaffenburg and Belfort, subcontractors, and also with other enterprises from Southwest Finland. (1)

During the project, TUAS benchmarked other partner universities, Aschaffenburg, Belfort and Hannover as they have long experience in VET- education. Using this information of best practices TUAS have developed new RADICAL model of engineering education in TUAS. This new model was developed and trialled in co-operation with project partners and TUAS has now introduced (Finnish) InTO- learning model which has gathered lots of interest among companies, society and other universities of applied science in Finland.

Core idea of RADICAL model is work-based learning which will be supported by new VET-businesses mentoring model. These cornerstones tie companies even more closely to the modern way of educating future marine technology professionals. This report is to provide structured information regarding pilot studies in RADICAL project. Case report includes cases about learning, organization developing and mentoring.

The RADICAL project aims to provide a new model of higher education which has individual, dynamic and flexible learning environment, where theory studies can be integrated part of the problem-based learning. In this project, the target has been to develop practical ways to manage learning so that the maximum level of tacit knowledge can be transferred. Tacit knowledge can be seen as situational knowledge which is not so easy to teach in classrooms. Compared to previous study models RADICAL model offers significantly more workplace learning. This way tacit knowledge transfer to students can increase significantly. Nonaka's & Takeuchi's, four-step SECI-model has been introduced during the RADICAL project (2).

Transferring of tacit knowledge is ensured by the development of functional mentoring system:

1. Finding the best ways to mentoring e.g. learning by teaching, multidisciplinary project teams, learning by doing and problem-based learning are all methods which are tested under the Innovation Pedagogy approach.

2. Gathering companies' possibilities and capabilities to this new cooperation with first student groups.
3. Testing multiple different methods simultaneously in two semesters
4. Finalizing the model and stabilizing it in TUAS Summer-Autumn 2019.

2 Case study as a method

There is a need to make an analysis and evaluations regarding TUAS' *ENGINE* learning model. Analysis will be done to understand how piloting studies have succeeded and how newly developed and trailed learning model could be further developed.

Case study has been chosen for a study method to collect the information and make an analysis of the functionality of new *ENGINE* model. Case studies are commonly used in social science and educational research. Case study research is not considered as a scientific method to determine cause and effect and it is not used to discover truth to make predictions. Case study is an ideal method when the aim of the research is to find answers to “why” and “how” types of questions (3). Purpose of the study is to create a common understanding of the studied topic. It is about study or exploration and later creating a description of a phenomenon. The advantage of the case study research design is that study can be targeted on specific and interesting cases. Detailed study can be done to selected individual or a small group of individuals. Case studies are typically qualitative in nature, resulting in a description of behaviour or experience. The main characteristics of case study research are that it can be very much focused and can provide a high level of detail. It is also able to combine both objective and subjective data (4). Case study follows the process described below.

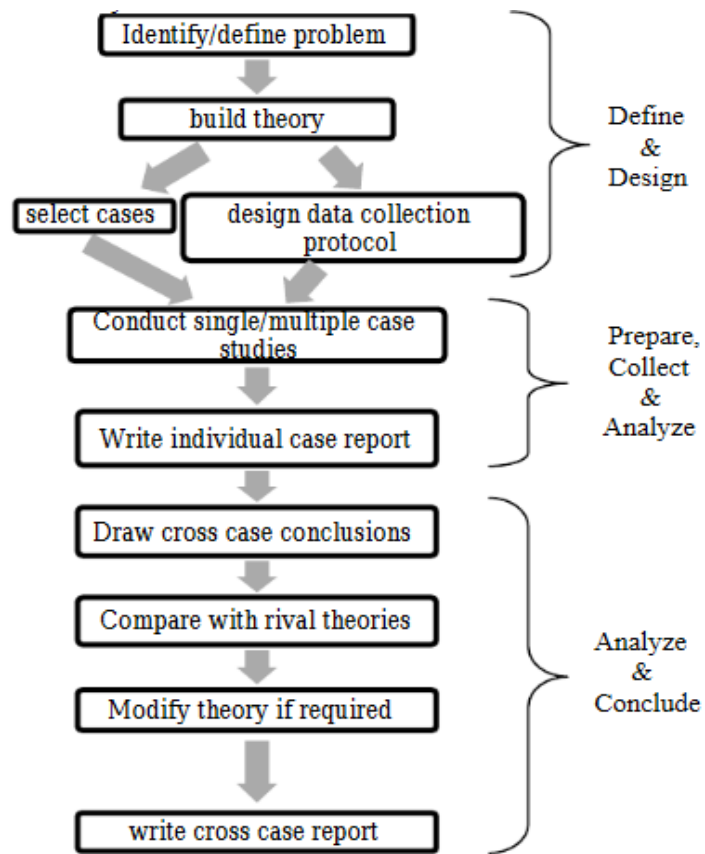


Figure 1: Method of Case study (3)

3 Defining the case study

Defining the case is the first phase in the case study process. This phase includes planning of the whole case study, selecting the methods used and select cases (units) to be studied. Also, the framework and assumptions are defined.

Methods selected for executing the case study are i.e. questioners, interviews, written document studies. This way it is possible to create different views and fill in the gaps to the topic we are observing. Preparing the questions which are the most time-consuming task in case study design phase and success of study is dependent on the quality of questions. Questioners are designed parallel as the framework has been defined.

This multiple case study consists of few cases which are selected from RADICAL project pilot groups. Cases are prepared from the first pilot students of the RADICAL project. Pilot studies have been carried out in the Mayer and Carinafour companies. Meyer Turku Oy shipyard is partner (P4) in the RADICAL Project and Carinafour is a company under an umbrella of Blue Maritime Industry.

Framework is to describe the topic, scope and assumptions for the study. In RADICAL project, the project description possesses many assumptions which have been made regarding learning, tacit knowledge, mentoring etc. With the questionnaire, there is an intention to collect information on how these assumptions are experienced after the trial of the new learning model.

3.1 Framework for study

ENGINE learning model, which is the result of this project, has several areas of governance which have needed coordination during this implementation project. Main phases and elements of the *ENGINE* model development was defined as: (6).

- Application Process
- Scheduling of Studies.
- Agreements.
- Learning Agreement and Evaluation of Learning.
- Mentoring Model.

Despite the whole area of governance, the framework for this study has been defined already earlier in RADICAL project description. In deliverables D2.4 Piloting, it has been defined that the case study is executed in three elements of RADICAL model (1) Learning, (2) Mentoring and (3) Organisation developments. Mentoring is the main driver for assuring learning in this RADICAL project.

When student is selected to *ENGINE* studies, learning agreement will be done after matching student and company, both parties will sign a learning agreement of workplace studies. Evaluation of these studies will be done against both learning theoretical objectives and knowledge of the processes and methods at workplace. The student will demonstrate his/her knowledge and skills with several methods, depending on the course (6).

ENGINE model studies are supported with mentoring process. Each (company and University) will nominate an experienced representative as a mentor for the student. The mentoring model has two parts: the mentoring relationship including meetings between mentor and student, and the knowledge sharing workshops at TUAS. During the studies, the student will write a diary of learning and discussions. (6)

One assumption was that “Transition of existing tacit (implicit) knowledge in industries is not taken into account in education well enough”. Therefore, RADICAL project targets to increase tacit knowledge transfer during studies in university. Project has used the SECI model as a theoretical framework while designing the *ENGINE* learning model. This SECI model contains four steps Socialisation, Externalization, Combination and Internalization. Supporting this process of sharing tacit-information mentoring system has been created. Mentoring for RADICAL model means *socialization* which will happen between mentor (and other industry representatives) and student and industry representatives and university staff. Students will then *externalize* the tacit knowledge to explicit in their studies and later *combine* all this knowledge to other students’ knowledge by participating studies at university. Increased knowledge will be shown in new development assignments to both the companies involved as well as to the university (*internalization*). These rounds could be done once or twice every semester to really enhance every stakeholders’ knowledge and competences (2).

3.2 Preparation of Questioners

Case study questions are targeted to predefined topics and prepared after studying the documentation which has been created during the project. Questions are prepared for three different target groups: companies, students and university. The aim of these questions is to collect information and understanding how functional the *ENGINE* learning model has been during the piloting and collecting ideas for further development. Questions have been distributed to candidates via e-mail. Case study questions are presented in Annex A.

4 Conducting questionnaires and analysis

After the questions have been made, they were divided into three different groups, university, companies and students. Each of the groups has questions which are all same in all the groups and questions which are specifically assigned only to the group selected.

Questionnaires have been delivered via e-mails and there has been few weeks given for answering. After answering to question there has been interviews or skype-meetings to fill in the gaps and possibility to discuss topics which could not be presented in questionnaires.

4.1 Learning

Overall learning during RADICAL pilot was experienced good and effective even though content was not directly to the topics of theories described in study programs.

4.1.1 How students learning objectives and study agreement was created/ agreed?

Learning objectives were agreed at the beginning of the studies. University teacher had prepared the study agreement with fine-tuned learning objectives more suitable to workplace learning. This agreement was approved by both student and company. This also can be one reason why students didn't recognize the question about study agreement. In the future, it is instructed that the study agreement is prepared by the student.

During this pilot trial, all the learning objectives didn't fit to the workplace task there for teacher needed to modify these objectives. This fine-tuning students couldn't recognize as they didn't prepare the agreements. Students answered that they have reached the target set for the course as the teacher mentioned that the objectives of the study agreement were reached. This highlights the importance of these first steps activities when starting *ENGINE* studies.

4.1.2 How did you study the theory part of the courses and how evaluation was?

There were big differences in how student identified the content and scope they need to study from theories of selected courses. Some students spent all the time at workplace

preparing the assignments and some has fully participated in lectures and were more involved in the theory topics of the course. In the future, there should be more guidance to students how this *ENGINE* model studies are structured for students. Some students felt that they could have learned more content of theory at their activities in university “I reached the learning objectives moderately, not so in-depth than I would have in school”.

Evaluation was based on reports, presentations created from the topic on hand and learning diaries of the students. University identifies that there is a need to keep the evaluation equal whether students are studying *ENGINE* model studies or student is doing normal studies at university. This requires more intense co-operation with students and company representatives or mentors. Learning diaries were used for evaluation but those didn't reflect almost at all topics of learning theory but more actions of each day at the workplace. So there should be more information and skill needed for student to prepare learning diaries.

4.1.3 What learning/benefits your company gained by participating *ENGINE* model learning?

University point of view was that it was very good to do a pilot training because after the pilot there is much concrete understanding how much resourcing and communication this new *ENGINE* model studies requires. Students felt that they gained skills that they would not have gained in other regular studies. Also, students felt it was good that they had their own projects and responsibilities and expectations set by the company. Companies had an understanding that they could have more influence on the content of engineering studies and they could hire later more ready engineers to work in their company.

4.2 Mentoring

Mentoring is somewhat new element which is needed in *ENGINE* model learning. Therefore high expectation were set for this activity. During the case study, it was recognised that mentoring didn't happen as expected during the pilot training. There should be given great importance to mentoring activities when this *ENGINE* model is fully provided to students in TUAS.

4.2.1 How frequent and how much time were spent in mentoring discussions?

Results from questioners reveals that there has been regular mentoring meeting with students and mentors or company contact persons. Meetings have been held weekly or so and it seems that students either didn't quite well understand the meaning of the mentoring process or mentoring held too often. Meetings have lasted from 10 minutes to 1 hour depending on the issues covered during the meetings. Also, issues in the meeting have been more of the issues related to the project assignment rather than learning and studying. Of course, at the end of the studies, there has been a mentor meeting where results have been assessed and the grades have been given for the students.

4.2.2 Did your company have already mentoring system in use?

Any of the company representatives has not answered the questioner, therefore, it is not possible to give any analysis from this point. Only it will raise a concern on how well companies are going to adopt this new *ENGINE* model learning and how willingly they are going to perform their part in these studies. It will be a key question what relates to students rights and fairness participating in these studies.

TUAS has recognised that there will be a need to clarify and provide training of mentoring to companies which will be partners in this new *ENGINE* Model Learning. This requires regular meetings with companies and training of personnel in University and Companies involved.

4.3 Organisation developing

4.3.1 Why your company applied to study *ENGINE* model?

One motivator for the companies was that by participating in the *ENGINE* model learning and RADICAL project they could influence what kind of engineers there will be in the labour market in the future. Companies want to influence future study objectives and what kind is the learning environment students may have. On the other hand, companies felt that by studying in *ENGINE* model makes students more ready to working life when they graduate. Students have experienced studying at *ENGINE* model very rewarding as they have been participating companies daily routines and they could recognize how theories are

implemented practically in work life. They have felt that they are learning more this new way.

4.3.2 What ideas you have to develop mentoring/learning in *ENGINE* model?

Turku University has identified that mentoring and developing mentoring skills is essential to the success of studies in *ENGINE* model. This mentoring process needs clarification to all parties in *ENGINE* model especially student and companies. This higher attention to mentoring will help students with their study plans. As bureaucracy was one issue that student felt that should be improved and also they wanted more help on creation of study and project plans.

4.3.3 What are your benefits in *ENGINE* learning methods?

Students recognized that there are many benefits studying in *ENGINE* model. Biggest benefit was the combining practice and theory simultaneously. They could experience how theory is implemented in a real organization or company. Also, they felt that they had a better chance for networking than others.

Point of Turku University, they have improved their communication and co-operation with companies and can, therefore, better develop education to fit the needs of the companies. TUAS also recognizes that students participating *ENGINE* model learning may graduate faster and students may have better possibilities to get employed.

4.3.4 What risks you can recognize in *ENGINE* model?

TUAS identified a situation where student will get only one company's view and not a wide perspective of understanding regarding the objectives of the study. Also, there may occur a situation where student will not do agreed development tasks, but instead some other eg. routine duties that will be given by the company.

5 Conclusions

Results from the *ENGINE* model piloting shows that there is a place for this kind of study model in higher-level education in Finland. Piloting gave different partners a good understanding what is needed to be part of this training model. Based on experiences partners can make decisions are they willing to participate in these studies later.

After visiting the partner universities and collecting all best practises from partner universities, TUAS InTO-model was prepared and piloting of new model was executed. Experiences, after piloting the *ENGINE* model, are mostly positive in all partners involved in the piloting. Case study was executed after pilot studies to evaluate results *ENGINE* model learning.

Case study results were described in detail earlier in this report. Case study explained what good issues were experienced during pilot studies and also study gave insights to topics which needs to be improved when study model is implemented and further developed. Students felt that they learned a lot during InTO -studies but also opposite way they didn't like the bureaucracy. University of Turku recognised that mentoring needs to be further developed both in companies and university. Key to further success of the study model is how companies will take responsibility for the student's study and experience in industry. After piloting the RADICAL project has got lots of interest at Turku area and TUAS. For example, there has been interest for *ENGINE* model in TUAS in the following fields, ICT, wellbeing travelling, and the Arts Academy, so it seems *ENGINE* model has a lot of possibilities.

6 Sources

1. Enhanced Higher Education - Industry Cooperation improving Work Capabilities of Sales Engineering Graduates, Schneider-Störmann, Röhr, Jaskari, Holopainen and Reunanen.
2. RADICAL 2017 Project Description
3. https://cirt.gcu.edu/research/developmentresources/research_ready/descriptive/case_study
4. https://www.researchgate.net/publication/238621009_Case_Study_Method_for_Design_Research_A_Justification
5. Engine_Opiskelijan_työssä_oppimisen_suunnitelma.
6. *ENGINE* Model – Changing Higher Education with Industry Cooperation, Rauni Jaskari(□)1

Annex A Case Study Questions

A.1 Learning

Students:

What were the key points of the learning agreement?

Which courses you were learning at the *ENGINE* model studies?

Describe your learning objectives during pilot studies.

How well your work in the company fit to your learning objectives?

How did you studied the theory part of the courses?

How was the learning and skills evaluated after the course?

How well the learning objectives were reached?

Describe your learning experience what you consider you have learned?

What risks or threats you can recognise in *ENGINE* model learning?

Companies/ University:

How learning objectives were created/ agreed?

How well the students learning objectives were reached?

How to make sure that evaluation is equal to students, not learning in *ENGINE* Model?

A.2 Organisation developing

Why your company applied to this project?

How your company support University has provided for you studies/company?

What ideas there is to develop mentoring/ *ENGINE* model?

How would you develop learning in *ENGINE* model?

What risks you can recognise in this leaning methods?

A.3 Mentoring

Company / University:

Did your company have already mentoring in use?

How the mentor was selected in your company

How much experience you have or have you received training regarding mentoring?

Describe your skills and process of mentoring.

How frequent was the mentoring with student?

How much time was given for mentoring, was it enough?

How would you improve mentoring process?

What risks your company notices in *ENGINE* model.

Student:

How mentoring process or mentor influenced your learning?

How skilled mentors were in mentoring?

How often you had a meetings/discussion with your mentor?

How much time was spent in mentoring meetings?

How mentoring affected to your studies?

How much time you could spent in networking?

How would you improve mentoring process?

What risks you notice in *ENGINE* model?