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RDI – PART OF HIGHER EDUCATION STUDIES

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Abstract

Research, development and innovation (RDI) projects have increased in higher education institutions in recent years. One of the challenges in higher education is to engage students in the project. Despite the challenges, RDI project integrations are possible by good planning. Integration of RDI projects and education requires good cooperation between RDI experts and teachers and the commitment of each stakeholder. One critical point is focusing on courses competence validation and planning on how to combine the tasks of the project and the Competence Objectives of the students. RDI projects are one way to offer and challenge students by developing projects in business.

This article's insight presents ideations by two RDI-cases of Laurea University of Applied Sciences in Finland and their project integration in higher education studies. The CAITO, Meta-cluster for attracting the Japanese tourism market project expanded and strengthened the expertise of rural tourism service providers in Western Uusimaa (Finland), Estonia and Latvia to meet the expectations of Japanese tourists. Green financial statements and accountability as part of the green transition – The Green responsibility project focus on expanding the range of responsible services for accountancy firm's clients.

For example, students have, e.g., focused on mapping state of the art and clients' expectations by interviewing and doing surveys during the projects. Students involved were national and international. Students developed new and current services in cooperation with project teams consisting of consortium members. Students also participated and organised e.g. workshops aimed primarily at SMEs. Cooperative companies were able to enlarge their personnel competencies and implement and develop new projects for their business.

Students' involvement in project integration was vital in various areas of both projects. Considered main factors in both projects were crucial in anticipating the future of involved companies' business, such as expanding trade, evaluating and developing business, anticipating market situation and value chain, corporate social responsibility report and cultural customs.

In these projects, the integration of RDI into teaching was a remarkable success, but this is not always the case. There should be a clear plan and a unified way to integrate RDI projects into teaching in higher education institutions. The Finnish University of Applied Science has understood the importance of integrating RDI and teaching, and to make this process successful, it must constantly be developing.

Keywords: RDI projects, higher education, project integration.

1 INTRODUCTION

The Finnish R&D expenditure ratio to GDP has risen slightly in recent years. Corporate R&D spending has increased since 2017, but growth is not fast enough to reach the 4% growth target for R&D intensity by 2030 [1]. Labour productivity has grown only moderately in Finland since the 2008 financial crisis, contributing to Finland's GDP lagging behind other Nordic countries over the past ten years.

International competition in RDI activities has intensified, and therefore the development of the RDI operating environment and the importance of the quality of RDI activities are becoming increasingly important. The importance of national and international cooperation will be even more critical. In Finland, the collaboration between companies and research organisations has traditionally been strong. Finland ranked 7th in the joint publications of Eurostat. Over the last ten years, direct university funding for companies has been declining [2]. Universities, universities of applied sciences (UAS), and other research organisations participating in international cooperation and companies investing in RDI activities act as producers, disseminators and applicators of information, and developers of new technologies. Research and innovation policies are crucial in tackling society's severe problems and promoting sustainable growth and prosperity.

Decreased government funding for the university field is not the only reason RDI projects are essential for universities. Competent personnel are a critical factor in the success of R&D and innovation. There are considerably fewer young adults (aged 25–34) with a higher education degree in Finland than in the comparison countries. The goal in the 2030 vision and roadmap for higher education and research is to have at least half of young adults complete a higher education degree by the end of the decade [3]. Achieving this goal means that the core funding of universities and the university of applied sciences contributes significantly to achieving this goal, which is a crucial prerequisite for achieving a sufficient number of R&D experts.

In Finland, the so-called dual model in which universities are more involved in scientific research and the university of applied sciences are doing more applied research and various working life development projects. Externally funded RDI projects are an excellent way to combine RDI activities with studies and get more teachers and students involved. The integration of RDI activities and education has been discussed throughout the existence of the p system. In an ever-changing field of action, there is still a need for new openings, and various models have been presented in this regard. [4]. RDI-integrated learning promotes the common knowledge of students, teachers and working life [5]. UASes RDI activities are mainly manifested as an applied study that develops new methods, services, applications, or tools with companies and other working partners [4].

At Laurea University of Applied Sciences (Laurea), as at other Finnish UASes, there is a lot of cooperation with companies and students are engaged in business partners projects. Several RDI projects at UAS also include working life partners. Laurea has developed and will continue to create good practices to integrate RDI activities into education and is considered successful. This article describes the experiences of two RDI projects where the combination of education and RDI has been successful.

2 COMBINING RDI PROJECTS WITH TEACHING AND LEARNING

There are many challenges in combining RDI projects with teaching and learning in higher education. Many things need to be considered in the planning and preparation phase of RDI projects for this to succeed. The rules of the different project funding instruments need to be well known to know how the things implemented in the project can be combined with studies, and students can be involved in the project work. In addition, it must be well planned to which studies the project work can be combined and in what way. The RDI units of higher education institutions need to work closely with lecturers to make this a success.

In all UASes in Finland, RDI projects play an essential role. The amount of state funding for higher education institutions has decreased compared to previous years. Higher education institutions will have to raise more and more funding to support their activities and secure their activities. Externally funded RDI projects also require project workers, and hiring them can be challenging. In addition to project staff, lecturers and students are often needed and wanted for the projects to be implemented. Integrating projects into education is one way to get enough elements into externally funded projects.

Laurea's project work aims to improve RDI projects and education integration continuously. The task of the RDI unit is to familiarise lecturers with project work so that they can be involved in projects already at the planning stage. The RDI unit's support for lecturers is of paramount importance, as project work may not be very familiar to all lecturers. On the other hand, lecturers know best what types of courses exist and which courses project work could be included. In addition, lecturers are familiar with the substantive subjects taught and can plan ways to develop students' skills. There are many opportunities in the projects to build students' skills, as long as the planning is done well. Project work can be combined with existing courses, or groups of students can also do individual projects. Doing a thesis is also one way to link student work to RDI projects. It is also possible for students to do their internship in an RDI project in some projects.

3 RDI CASES

Laurea has had several RDI projects with teaching, and RDI work has been successfully integrated. This article describes the backgrounds of two RDI projects in which teaching and RDI work are combined differently. These exemplary RDI projects varied from each other, but they integrated project work into existing courses. In addition to this, students have done individual case projects and theses related to the RDI project. A few students have also done their internships in the project. In addition to involving students, also lecturers engaged in projects in many ways.

3.1 CAITO project

The Central Baltic INTERREG program funded the CAITO project, and its official name was "Met-cluster for attracting the Japanese tourism market". The CAITO project expanded and strengthened the expertise of rural tourism service providers in the regions of Western Uusimaa, Estonia and Latvia to meet the expectations of Japanese tourists. The CAITO project used interviews and surveys to find out the expectations of Japanese tourists. Surveys and interviews were conducted with Japanese tourists, tour operators, and a few representatives of Scandinavia's tourism magazines while travelling in the Baltics. The CAITO project, Laurea University of Applied Sciences, the Ruralia Institute and the City of Lohja cooperated with Laurea University of Applied Sciences students to map the expectations of tourism service providers in Western Uusimaa and to develop tourism services and possible new services. Participation in workshops, seminars, mentoring and collaborative projects on the topic of the CAITO project was voluntary. These were aimed primarily at micro and small enterprises in Western Uusimaa, which focused on Japanese tourists and their expectations and still on business and skills development. [6].

Project integration as a student collaboration was vital in various areas of the CAITO project. In the project integration of studies, several cooperation projects between students and the CAITO project companies were implemented. Factors to consider when meeting the expectations of Japanese tourists include factors related to cultural customs, language skills, changes in the tourism market and the long distance between Japan and the Baltics. From the point of view of Japanese tourists, the Baltic countries and the region of Western Uusimaa in Finland are interesting, e.g. pure nature, traditions and culture. The project sponsor-enabled tourism service providers' product development and the number of visitors to Japanese tourists have already been actively increasing for the project participating tourism service providers in the Western Uusimaa region. [7].

3.2 Green financial statements and accountability as part of the green transition - Green responsibility

According to the Green responsibility project application, the project responds to concrete needs by meeting the demands of the circular economy through the services of accounting firms. It enables accounting firms to increase their turnover by supporting responsible business development through corporate responsibility and the transparency of green financial statements. The project's primary goal is to develop the resilience of accounting firms for small and medium-sized green economies and to create a new service design model. [8].

The new model will enable accounting firms and their clients to do neutral, objective green financial statements and responsibility reporting, regardless of industry. Another goal is to increase the ability of accounting firms and their staff to change the green economy. Through co-creation and peer reflection, the common goal of the green economy becomes more precise, which supports the making of new responsible solutions and the ability to change. [8].

Responsible solutions and the ability to change are related to the project's third goal to expand the responsible service offering of accounting firms and identify and develop expertise in green financial reporting and corporate responsibility reporting. The fourth goal of the project is to create a new neutral and consistent service model for green accounting and corporate responsibility reporting with accounting firms through co-development methods. [8].

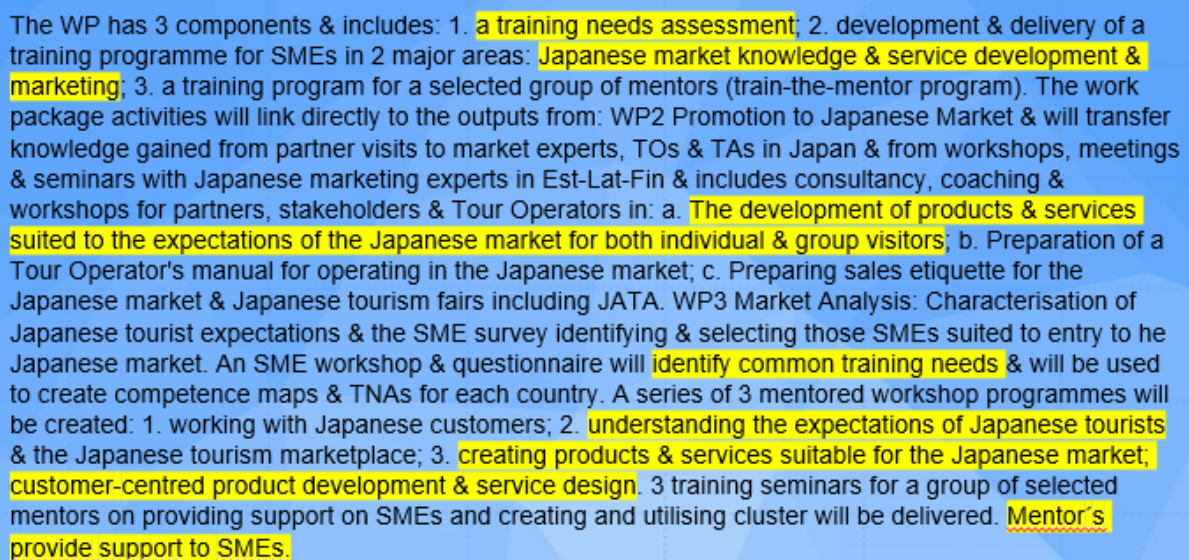
The service model, which small and medium-sized accounting firms will use in the project, will strengthen their clients' awareness of the factors of the green economy as part of their business and competitiveness. The service model enables an additional factor in recovering from the corona epidemic as a short-term effect. As a long-term effect, examining green economy factors and responsibility reporting will be harmonised in Finland's target areas and elsewhere. [8].

The project aims to create equal opportunities to participate in the project's activities and to renew one's skills and work practices. The project's primary goal is not to promote gender equality, but it can affect the gender of the industry and its image. From this perspective, the project may have indirect effects on gender equality. The result of the project is an increase in the awareness of accounting firms and their clients about green financial statements and corporate responsibility reporting. As a result of the project, the green economy will be seen both as part of everyday operations and as a competitive aspect through a new operating model and the service provided by accounting firms. [8].

3.3 Planning the RDI integration in education

The best choice for RDI integration would be when students themselves could be involved in preparing an RDI project for a particular financial instrument. In these two cases, the schedule was so tight that this could not be done.

When preparing a project application for a specific financial instrument, the background factors must be the type of competencies defined for the courses and how they are coordinated with the activities and objectives of the RDI project. If these are not figured out during the RDI -project's preparation, the exact definitions with matches will be done by comparing the confirmed project application and course descriptions. During the process, every sentence and even word will be considered at the start of the integration planning process. Especially the need for integration and cooperation between students and the RDI project is in a substantial role. How and in which courses, curricula's competencies and aims are tied up. How all stakeholders, e.g. RDI project, students, SME's, and final customers, will have a win-to-win conclusion of the RDI-integration. Notes of all mind-mapping considering study cooperation are worth writing. Figure 1 shows a concrete example of text analysis for education and course integration projects.



The WP has 3 components & includes: 1. a training needs assessment; 2. development & delivery of a training programme for SMEs in 2 major areas: Japanese market knowledge & service development & marketing; 3. a training program for a selected group of mentors (train-the-mentor program). The work package activities will link directly to the outputs from: WP2 Promotion to Japanese Market & will transfer knowledge gained from partner visits to market experts, TOs & TAs in Japan & from workshops, meetings & seminars with Japanese marketing experts in Est-Lat-Fin & includes consultancy, coaching & workshops for partners, stakeholders & Tour Operators in: a. The development of products & services suited to the expectations of the Japanese market for both individual & group visitors; b. Preparation of a Tour Operator's manual for operating in the Japanese market; c. Preparing sales etiquette for the Japanese market & Japanese tourism fairs including JATA. WP3 Market Analysis: Characterisation of Japanese tourist expectations & the SME survey identifying & selecting those SMEs suited to entry to the Japanese market. An SME workshop & questionnaire will identify common training needs & will be used to create competence maps & TNAs for each country. A series of 3 mentored workshop programmes will be created: 1. working with Japanese customers; 2. understanding the expectations of Japanese tourists & the Japanese tourism marketplace; 3. creating products & services suitable for the Japanese market, customer-centred product development & service design. 3 training seminars for a group of selected mentors on providing support on SMEs and creating and utilising cluster will be delivered. Mentor's provide support to SMEs.

Figure 1. Checking through the RDI application for integration into courses [7],

Highlighted sentences and word correspondence between the RDI project's needs and course competencies were examined. The result of the analysis, in this case, was that studies of business management, IT and hospitality had studies where the RDI-aims and goals could be integrated. The project manager contacted more than 20 senior lecturers and discussed the cooperation of the RDI - integration project (Figure 1).

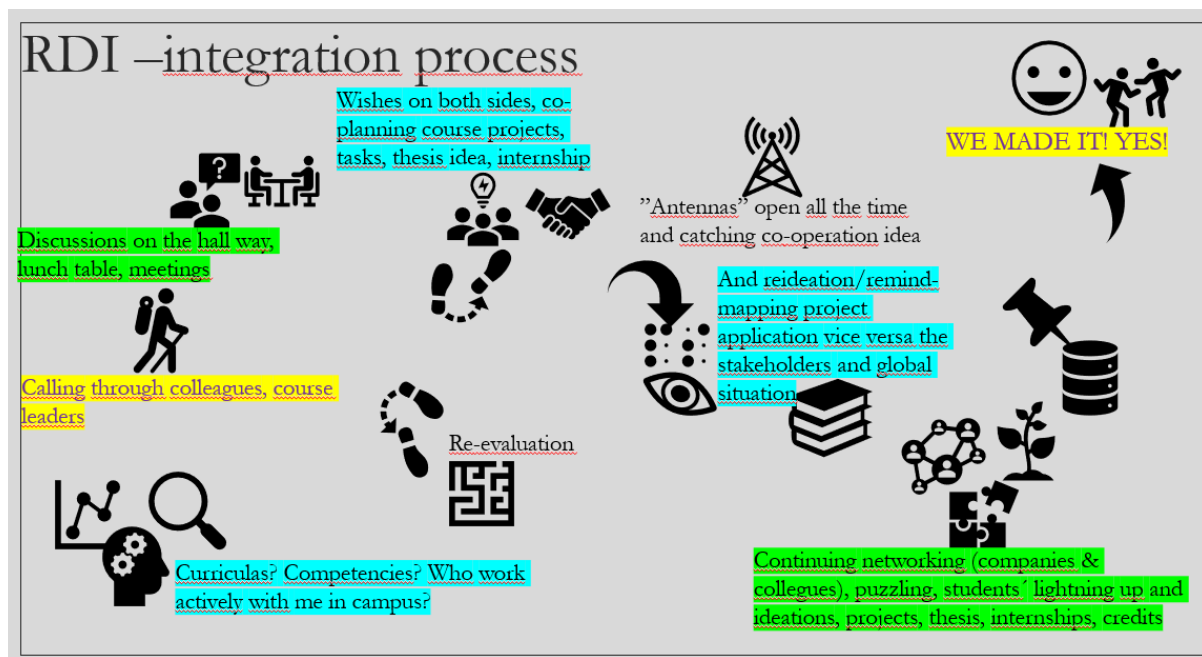


Figure 2: RDI-integration process in education [7].

Figure 2 shows that cooperation with the RDI project manager, project team and outer stakeholders, and senior lecturers in charge of courses is substantial to find out the best possible way of integration according to the aims of curricula's competencies and project. Cooperative work should also be interesting for students who are executing, e.g. projects, thesis or internships. Especially listening to senior lecturers and feedback from the students is essential to benefit all stakeholders and have a valuable and positive experience.

Continuation of re-evaluation, re-discussions etc., reflects, e.g., the changes of the project and the effects of the global situation and cooperation with all stakeholders. The process is endless until the RDI-project finally end. RDI project integration is continuing networking, unofficial and official discussions with stakeholders related to the project and puzzling the interests together.

After receiving the positive financing decision for the RDI project, it may be challenging to combine curricula and the project's aims, e.g. SMEs, as in these two RDI projects. Cooperation with companies' real needs was supposed to integrate students' projects according to their chosen curricula. Despite this challenge, fruitful collaboration was successful, and all participants and stakeholders were satisfied with the results.

Based on the feedback discussions at the end of the studies, the students involved in the student cooperation felt that the projects linked to the studies through project integration were positive experiences. The lecturers' experiences in the RDI project work were also generally positive. There were some challenges and small failures during the project, but all the problems were solved at least satisfactorily.

The CAITO project produced around 13550 credits, and the Green responsibility has produced around 1500 credits from last September until now. Produced credit points show how incredible the meaning of RDI-integration in education for the project has been for each participant. The senior lecturer who has not hesitated to cooperate with the RDI project has been a remarkable asset to successfully integrating the RDI project in education. In cooperation, re-allocation and re-evaluation are a necessity. Feedback from students, participating companies as well as colleagues drives further.

3.4 Process and students' involvement in RDI integration

This article's RDI project cases CAITO and Green sustainability were conducted in Laurea UAS, where Learning by Developing (LbD) pedagogy is one of the key elements of education. Therefore, these projects were also integrated into education to offer students real work life and research cases. According to feedback discussions, students involved have experienced these RDI-integrations

positively when finalising their project results. Students' primary studies consisted of Business Management, IT and Hospitality.

The process of RDI integration may vary depending on the preparation of the project. Discussions with senior lecturers in charge of the course content are essential from the beginning and during the integrated project/task etc. Communication of possible challenges and the feedback already during the integration is remarkable. It means the continuation of the cooperation and the reaching the aim of both sides.

Interesting RDI-projects responded with worthwhile, authentic, real-life development projects and research analysis motivated students as their results were meaningful for the research of the target company. Exchange students were amazed at the possibility of combining studying, learning, actual research, and company development projects into one suitable combination. Students produced innovative new development ideas for participating companies, and side results were customised development projects for stakeholders involved.

In the CAITO and the Green responsibility projects, integration into education was done throughout the project. As the project progressed, the plans were constantly updated. For example, studies related to marketing, tourism, entrepreneurship, service design, and business information technology could be directly integrated into specific aspects of the project. In addition to this, student groups independently carried out tasks in the project under the guidance of a teacher mentor. Due to the multi-year nature of the project, many of these study-related projects and independent projects were carried out. It brought a lot of new skills to students, lecturers and representatives of small and medium-sized enterprises involved in the project. Several of these were also done in the CAITO and Green responsibility projects, and several students did an internship in the projects. The project also included the training of representatives of small and medium-sized enterprises. Students were also involved with the lecturers in planning and implementing customer training.

One example of the development and advancement of students' skills is the participation of lecturers in the training of company representatives. The IT students planned and carried out a workshop for company representatives related to 360 photography with the lecturers. In the workshop, business representatives were taught 360 photography. Representatives of the companies received guidance during the workshop and got to try out 360 photography with the guidance of students and lecturers. In addition, company representatives were allowed to view their 360 shots with virtual glasses. Before the workshop, students had produced clear written instructions for the training, which were used and distributed to participants. The students had first studied things with the lecturer or independently when making instructions. Together, the students made instructions and tested them with other students before the workshop. In the workshop, students guided company representatives on-site in 360-photo photography and helped them record and view 360-footage photos using virtual glasses.

The workshop was a successful and positive experience for business representatives, students and lecturers. Representatives of the companies were very enthusiastic about it and felt that they would benefit significantly from such concrete guidance. Through it, customers also got new ideas on how the lessons could be utilised in developing and marketing the company's operations. At the same time, students' skills also evolved in many ways. Students learn new things in many ways. In making the instructions, they had to explore the subject both independently and under the guidance of lecturers. Students' skills deepened as they made clear instructions to clients and tested them. Advising and mentoring clients in the workshop further increased their expertise. Students also gained experience in guiding clients. The experience of the workshop also increased their confidence in their abilities.

Another example of integration is how students have made inquiries for CAITO and Green responsibility projects, e.g., inquiries for Japanese tourists about their expectations and needs when Southern Finland is considered their target destination. The project manager gave the definitions and aims for students. They planned questions and execution together with their lecturer of marketing management. Then they asked confirmation for of their progress from the project manager and executed the inquiry. After gathering the data, students chose the appropriate analysis method and tools with their lecturer and analysed the collected data. Presentations of the results were made for the Finnish CAITO project team and other student groups. All listeners, lecturers of marketing manager, project team and project manager had feedback discussion, and students reflected on their learning experience and theories that they had learned from their own experiences. CAITO-project used gathered results further in several developing hospitality companies' customised projects and other collected data from the company business environment. Students have executed the Green responsibility project, e.g. inquiry concerning the knowledge of initiative EU's corporate responsibility law, offered responsibility reports by accounting

firms and effects of corporate responsibility on business. In the Service Design studies, the Green responsibility project defined the aims of the project team for the course's project by fulfilling the design challenge form (Table 1).

Table 1. The Green responsibility design challenge form.

Project Contractor	Green financial statements and accountability as part of the green transition - <u>Green responsibility</u>
Service Design project description	<p>Corporate social responsibility reporting as a service for different industry and service sector. (Project team can choose industry/service sector by themselves <u>e.g.</u> according to their own competence amongst the team. Wishing that each team has different angle to this project.)</p> <ol style="list-style-type: none"> 1) What kind of current corporate social responsibility report model in SMEs will be in 2025? 2) What kind of current corporate social responsibility report model for accountancy firms will be in 2025? 3) How to make corporate social responsibility reporting be clear, <u>relevant</u> and worthwhile to SMEs?
Customer segments	<p>Accounting firms and SMEs in <u>Uusimaa</u>, South-Karelia, <u>Päijät-Häme</u></p> <p>(Primary target group to be interviewed. If there are multiple target <u>groups</u> we will divide the groups similarly. <u>E.g.</u> current customers, potential customers)</p>
Expected outcome from the partner's side	<p>(Company's expectations for this project. More abstract than precise :)</p> <p>Fresh and out of box viewpoints, <u>aspects</u> and insights by your team's own competence to develop social responsibility report model for SMEs via accounting firms.</p>
Project support (Milestones for reviews, feedback, comments)	<p>(What kind of support is available from the partner side for the students?)</p> <p>Project team will answer your questions in CANVAS and can have a <u>check-point</u> if needed in half way of your project.</p> <p>Project team will book time to answer questions through the project regularly.</p>
Company description	www.vihreavastuu.fi
Contact details	<p>Jaakko Grönmark, jaakko.gronmark@laurea.fi Sini Maunula, sini.maunula@laurea.fi Suvi Sivén, suvi.siven@laurea.fi</p>
Confidentiality	Assignment for rights agreement will be sent for <u>your</u> to sign by <u>eSign</u> -system. No specific confidentiality agreement.
Laurea Service Design coaches:	<p>Veera Peltomaa Oskari Vesterinen</p>

At the start of the course, the Green responsibility project's project manager briefed students on the project and presented the design challenge. The project manager agreed to have four Q&A sessions where students could ask questions in this process. Students started with theoretical studies, and then the project's empirical part was combined. Little by little, e.g. students project teams made three different idea cards from which the Green responsibility –team chose one with which the team will continue their designing. Student-project teams proceeded to steps according to the service design process, two/three-diamond base. Around 100 students were involved, 20 student project teams in this case. Final presentations of the students' service designs were presented for the Green responsibility –project team and for accounting firms interested in developing their services to be more future-oriented. The work continues with the piloting accounting firms in autumn 2022.

Personal discussions concerning the student's interests make thesis ideations in projects besides the allocated aims to ensure the commitment. The project manager acts as the client and the student's actual supervisor on the university side. Internships in RDI projects are always allocated according to the needs of the project and the student's competence. Internships in projects correspond to companies or other organisations' skills and difficulty levels.

4 CONCLUSIONS

In summary, the successful integration of an RDI project and education requires a good understanding from all parties. It requires a lot of prior knowledge of both the project and the appropriate integration opportunities within the organisation. These two examples from Laurea show that integrating RDI projects into education is an excellent way to get students, working life representatives and higher education staff to work together on externally funded projects.

In the planning phase of RDI projects, paying attention to many things to integrate project work into studies is essential. In connection with reviewing the project's objectives, many commonalities can be found in developing students' competencies. Knowledge of the curricula and the contents of individual studies must be at an excellent level to succeed in this work. Successful work requires close cooperation between those responsible for planning RDI projects and lecturers. The people responsible for planning and applying for RDI projects often do not act as lecturers themselves but as experts responsible for research organisations. Those who work in RDI as their primary activity usually know the contents of different financial instruments. It is essential to obtain project funding. On the other hand, lecturers have a good knowledge of curricula and students' competence goals. Lecturers know what competencies and skills students should develop at any stage of their studies, and it helps lecturers plan to achieve these goals.

Laurea uses a development-based learning model, the Learning by Development (LbD) action model, in which students engage in genuine business collaboration for most of their studies. Linking studies to RDI projects is not very different from this LbD action model used in Laurea, but it certainly has its unique features. If the planning and preparation phase of the RDI project has been able to take this into account, no problems should arise. In all those projects where the integration of education and the involvement of students is possible, it is worth doing. In these two examples, the CAITO and Green Responsibility project, the experiences of all parties, students, customers, project partners and lecturers, has mainly been positive. The projects have generated a lot of new knowledge for all parties' students, lecturers, consortium, useful outputs and innovative ideas and the learning experiences for companies and added value to the project work.

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