Notes on the Developing R&D Integrated Learning in Regional Knowledge Production*

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Abstract

The aim of this article is to examine and reveal basic elements that occur during the R&D integrated learning process. The observations were made by reflecting on the procedure and the feedback of implemented learning and “Good Ageing in Lahti Region” (GOAL) -research and development project. Finally, different models of integrating learning and R&D were discussed and conceptualised. There were advantages, opportunities and challenges in this kind of R&D-integrated pedagogical model. It was highly challenging and motivating at the same time. This kind of new studying and learning model implies a transfer from teaching to learning. The guiding principle in teaching and learning is competence-driven. In this article we present the elements of the “Network and Innovation Integrated Learning –model (NIIL), where knowledge is a process of construction where partners negotiate meanings and build knowledge within a social context together.

Keywords: Learning by innovation, learning models, regional development
Tiivistelmä


Asiasanat: Yhteisöllinen oppiminen, opiskelijat aluekehittäjänä, integroiva opetus

Introduction

In order to facilitate the flow of knowledge, ideas and learning, communities should adopt the principles of knowledge creation and continuous learning; they must turn into “learning regions” (Florida 1995). In “learning regions”, individual and collective expertise and aspects emphasising communality are joined together (Tynjälä 2006). In striving toward a knowledge-building culture, Bereiter (2002) emphasises the close collaboration between researchers and teachers. In higher education this refers to the tighter collaboration be-
between teachers, students and researchers. The demand that teaching and research and development (R&D) should be more firmly drawn together is a response to the number of changes in the modern knowledge society, including changes in the mission and in the funding of higher education and in the nature of knowledge and learning.

Traditionally, universities and universities of applied sciences (UAS) have offered separate learning environments for theoretical and practical studies. Today’s challenge has been to bridge this gap and enhance the interface between universities and workplaces. Study modules like internship (Laitinen-Väänänen et al. 2007) and project works (Helle et al. 2006) have been seen as forums for this kind of encounter. When learning in classrooms can be fictive and theoretical, the participation in the R&D activities offers students a chance to step outside and into real life to meet potential employers and clients. At its best, students have the chance to participate in R&D –projects so they may integrate theoretical and practical knowledge, test ideas, work together on specific problems and contribute to the mode-2 type labeled knowledge production (Gibbons et al. 1994) in multidisciplinary teams, which has been considered illustrative for UAS (Surakka 2008).

In mode-2 type of knowledge production, the traditional distinction between R&D and learning/teaching tends to break down. Distinguished from traditional mode-1 type of knowledge production, which is investigator-initiated and discipline based, the mode-2 type is problem-focused and multidisciplinary. Though individual interests exist, the goal of knowledge production is shared and mutual.

Furthermore, the state policy in an individual country, like in Finland, can challenge the UAS to contribute to regional development by carrying out R&D and by organising higher education studies and promoting the lifelong learning (Act of University of Applied Science 351/2003, 5§). In addition, the UAS have been expected to promote and diffuse innovations by working together
with local partners, like public organizations and especially small and medium size enterprises.

The aim of this article is to examine and reveal basic elements that occur during the R&D integrated learning process. The observations were made by reflecting on the procedure and the feedback of implemented learning and “Good Ageing in Lahti Region” (GOAL) -research and development project. Finally, different models of integrating learning and R&D were discussed and conceptualised.

“Good Ageing in Lahti Region” (GOAL) -research and development project

The bachelor students (n=134) from social and health care degree programs (nursing, physiotherapy, social services) in Lahti UAS participated as research assistants in the large, ten year “Good Ageing in Lahti Region” - research project (GOAL), who’s unique network combined one university, one UAS, one research institution, one public health care organisation and 15 municipalities. The assignment of the students was to organise the follow-up measurements in collaboration with lecturers (n=3) and other research actors e.g. project steering committee (n=12) during winter 2008. The integration of the GOAL research project into the professional studies of students was designed by faculty lecturers and the research coordinator. In order to analyse the learning outcomes of the participants, the feedback/reflection meeting was organised at the end of process. The data from students, lecturers, researchers and examinees (n=2817) was collected by interviews, students’ learning diaries, observation notes, and a 360°- feedback questionnaire.

According to the feedback, students were very active and the working atmosphere was mostly positive. The students found rehearsing practical skills prior to fieldwork important and necessary. In the beginning of the fieldwork,
they felt afraid and tense, but afterwards the experience turned positive. The work in the R&D project was brisk compared to the theoretical studies and they appreciated the research-centered approach. Furthermore, the R&D project offered the students the change to integrate different professional competencies.

The examinees found students friendly and customer-oriented, although some mistakes and errors in measuring and in results occurred.

The participating researchers and project steering committee found students’ contribution challenging, but very important and helpful. The integration of students’ work into data collection decreased the expenses and the whole data collection would not have been possible without the students’ collaboration.

Lecturers were mostly motivated and satisfied with the process. They appreciated the researchers’ participation. They felt that this kind of studying emphasises the importance of integrating new content knowledge into practice. However, they wished for smaller student groups and for a longer fieldwork period. Furthermore, the co-operation between degree programs was inflexible and they did not succeeded in integrating the practical fieldwork into the theoretical studies well enough. In addition, the faculty was not informed well enough about all the learning possibilities the project served. For example, only one thesis was integrated into the GOAL-project.

In the following chapter, the conceptualised R&D integrated learning model is represented. The model was constructed by analysing the procedure and the feedback of the GOAL-project.

**R&D integrated learning model**

The basic elements in the R&D integrated learning model, represented in Figure 1, are based on the vision and the mission of the higher education insti-
tution and on the challenges of the region and the discipline faced today and in the future. It is a systematic increasing of knowledge. The model of R&D-integrated learning combines knowledge, skills and attitudes. After setting the aims, the working and study methods are selected, followed by the different outcomes, which represent the increased know-how of the region.

R&D-integrated learning facilitates working life orientation and student-centeredness in curricula. Therefore, it is highly challenging and motivating at the same time. This kind of new studying and learning model implies a transfer from teaching to learning. The guiding principle in teaching and learning is competence-driven. In addition, learning environments, like R&D-projects, which facilitate students’ participation, are encouraged. Furthermore, the R&D-integrated learning model challenges lecturers’ to develop their R&D project skills and skills to supervise students in conducting the projects.

Figure 1. The basic elements in the R&D-integrated learning model
Network and Innovation Integrated Learning –model (NIIL)

Regarding the increase of regional knowledge and know-how, other contributors besides higher education institution are involved. The Finnish innovation system consists of the producers and users of the knowledge and the various interactive relations between them. Central elements in the innovation system are education and training, R&D, and knowledge-intense business. New knowledge is produced by universities, research institutions, and business, among others.

In the next section of this article, we present the “Network and Innovation Integrated Learning –model (NIIL), where knowledge is a process of construction. In NIIL, partners negotiate meanings and build knowledge within a social context together (Figure 2).

During the traditional student- and learning task-centric teaching model (Figure 2), the student is in focus. At worst, she or he stays as a passive object, where as in student-driven NIIL-model, students work as an equal partner in an innovative eco-system, where diverse partners--e.g. higher education institutions, businesses, the public sector--work and innovate together. This kind of rewarding community of knowledge production includes more creativity, flow and spontaneous buzz than rules, order and linear processes. Innovation competence is mentioned as one of the generic competences of UAS graduates in Finland (Rectors’ Conference of Finnish Universities of Applied Sciences ARENE ry. 2010). Description of the competence in bachelor level is described as following: “is able to conduct research, development and innovation projects applying the existing knowledge and methods of the field, is able to work in projects, is capable of creative problem solving and development of working methods and is able to find customer oriented, sustainable and profitable solutions”.
There are two existing examples of the NIIL-model from Lahti University of Applied Sciences which can be mentioned: The Pocket School (http://www.pocketschool.fi/) and the “Rock your body” - learning module. In the Pocket School, students use smart phones to capture service-design significant moments and real world situations. They can then save and share the video clips via social media. The key concepts in the Pocket School are prosumer (professional–consumer, producer–consumer), service design, crowd sourcing, foresight, smart phones, brand, tele-education, video clips and social media. The “Rock your body” - learning module integrates theory and practice into the scientific research study (Väänänen 2003). The “Rock your body” idea was initiated by a private furniture company. The learning model has produced an innovative fitness training program for elderly people, a new rocking chair prototype, and several scientific research papers.
These two presented R&D learning models illustrate the basic elements in the interface of R&D and learning. They both need further assessment and practical testing in order to validate them. The models can be used in conceptualising the teaching practices and in visualising the role of the diverse partners in knowledge production.

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