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## FEATURE

### **Studio-Based Higher Education for T-shaped Knowledge Workers: A Summary of a Doctoral Thesis**

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## **Studio-Based Higher Education for T-shaped Knowledge Workers: A summary of a doctoral thesis**

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### **Synopsis**

Work life complexities - e.g. solving complex and wicked problems - require cooperation skills and ability to learn in collaboration across the disciplines, meaning skills in crossing boundaries. This article is a summary and reflection to a Doctoral Thesis, which presents a research how a Finnish studio-based pedagogical approach to bachelor education, the LAB Studio Model (LSM), contributes to the education of boundary crossing competence. The research results suggests that LSM offers a potential educational model for learning the skills of boundary crossing, further on encouraging the establishment of new studio-based learning configurations for knowledge workers higher education.

**Keywords:** boundary crossing, higher education, interdisciplinary, LAB studio model, studio- based education

### **Introduction**

According to the World Economic Forum (2016) 65% of children entering primary schools today will ultimately work in new job types and functions that currently don't yet exist. Headlines of this kind reflect the speed of change in the job market and work life, also challenging education institutions to respond to the call. The Knowledge society (e.g. Bell, 1974; Drucker, 1993, 1994) will have profound effects on educational, cultural, health, and financial institutions, and will create an ever-increasing need for lifelong learning and innovation. In the knowledge society, the new ways of knowledge creation, delivery and processing have an essential role in its economy and culture. Knowledge workers acting in the knowledge society are supposed to be lifelong learners who continually acquire and develop new knowledge. They must be able to critically select, acquire and use knowledge, wherever this is available (Engeström, Engeström, and Kärkkäinen, 1995) and continually construct and reconstruct their expertise in a process of lifelong learning (OECD, 1996; Tynjälä, 1999).

Performing successfully in the above-described multidimensional knowledge society requires all actors to have skills to cross boundaries. In order to do that, the knowledge workers need to possess deep disciplinary knowledge along with a keen ability to communicate across social, cultural and economic boundaries. The professionals performing in such setting are called T-shaped professionals (T-SPs), and are characterised by their deep disciplinary knowledge and understanding of systems in at least one area, and their ability to function as adaptive innovators and cross the boundaries between disciplines (T-academy, 2018). The concept of persons with skills of boundary crossing was originally proposed by Guest (1991) and Iansiti (1993), later also by Hansen and von Oetinger (2001). T-shaped professionals skills have breadth as well as depth. Breadth implies ability to cross a range of disciplinary areas, in other words, boundary crossing. A person with breadth is able to understand the vocabulary of a discipline, use it to understand and re-describe problems they may not be able to solve, but are able to reason about which discipline experts might be the ones able to solve them. Thus, the T-SP is supposed to have better communication, teamworking, and project experience, and hence is potentially more highly valued in the work-sphere (Spohrer, Golinelli, Piciocchi, and Bassano, 2010).

Higher education institutions globally have a significant role in educating knowledge workers towards the needs of the surrounding society. Universities emphasise the interaction with the surrounding society by establishing innovation- and collaborative-friendly learning configurations. One example of the learning configuration is Oulu University of Applied Sciences' (Oamk) Oamk LABs educational program. Oamk LABs is defined to as a business pre-incubator educating new self-aware professionals and self-directed teams (OamkLABs, 2018). Oamk LABs utilises the LAB studio model (LSM), a specific form of studio-based model as its pedagogical model. The studio model as a pedagogical approach suggests a more practical approach to education and has been utilised for centuries in the field of architecture and arts. In general studio model pedagogical practices are problem or project based, learning by doing and reflective practices. Students own and are allowed to modify, as well as have open access to studio premises environment, which is by its physical setting supporting teamwork (Schön, 1985). Despite the multidimensional nature of studio settings, involvement of several disciplines rarely exists. In addition, quite little is known about the learning processes that occur when students work across practices in multi-disciplinary and multi-stakeholder collaboration (Oonk, 2016), and also if the established learning configurations include actual collaboration outside the studio. The objective of the Doctoral Thesis research was to explore the ability of LAB studio model to contribute to the education of the T-shaped professionals in a Finnish University of Applied Sciences. This feature summarises the main points, results and conclusions of the thesis.

## Methodology

The research was performed in two phases, as illustrated in the Figure 1. In the first phase, the studio-based configurations were studied by the following themes, characteristics of the LSM (Theme 1) and interest towards utilising the studio model in higher education (Theme 2). In the second phase, the research focused on exploring LSM in the context of students' boundary crossing activity during their studies in a LAB studio. The above was studied by two themes, first by studying the student boundary crossing activity inside a LAB studio (Theme 3), for which the dynamic theory of organisational knowledge creation (Nonaka and Takeuchi, 1995) was chosen. Second, students' boundary crossing activity outwards from a LAB studio (Theme 4) was studied by the learning network established during their studies.

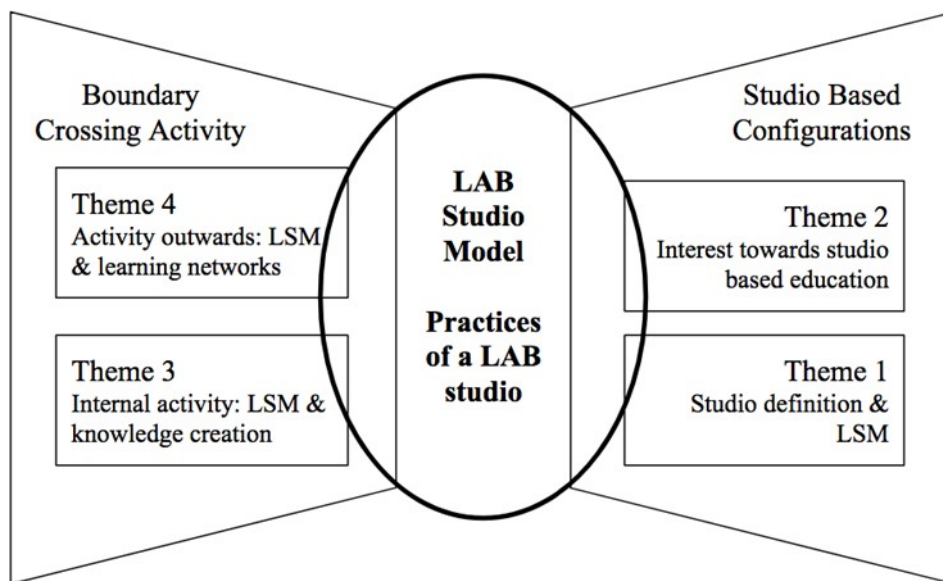


Figure 1. The research framework.

The research themes were expressed by four research questions (RQ), which focus on the main research question from four different perspectives building on each other. RQs 1 and 2 were focusing on the overall characteristics of the studio model and the LSM. More specifically, RQ1 focused on the distinguishing and unique characteristics of the LSM compared to the existing definition of the studio model, and RQ2 focused on the overall usage of the studio model in higher education learning configurations. RQs 3 and 4 were focusing on the boundary crossing activity within and outwards from a LAB studio.

Research questions were addressed in detail with four scientific articles. Article 1 identified the similarities and differences of LSM characteristics compared to the recent definition of studio model education. Article 2 identified the unique characteristics of LSM in contrast to the existing educational configurations utilising studio model education and studied the relation between definitions of entrepreneurial education and studio model education, as well as the utilisation of the studio model in entrepreneurial education. Articles 3 and 4 addressed the activity of boundary crossing in LSM by analysing how the knowledge creation is supported by the practices of LSM and by studying new learning networks established by the students during their studies in a LAB studio.

Exploratory and design research were selected as general research strategy and methodology. Exploratory research is often used to obtain a better understanding of a less clear phenomenon and establish guiding principles for further research; it tries to explore the effectiveness of the system under study (Creswell, 2013). Methodology also utilised design research, as it discovers ways to change and build systems based on theories and to define the effectiveness of these systems in practice (van den Akker, Gravemeijer, McKenney and Nieveen, 2006).

Each study began with a literature review to form a theoretical base for the research. Second, a literature study or survey structure was designed. The third phase involved data collection, which included either interviews or web-based surveys. The final phases of the research process included analysis and drawing conclusions. The main data sources were divided into two categories; published and indexed research literature, and students studying in LAB studios. The data for the research was collected by using a systematic literature review and qualitative methods of observation, a survey for individual students and semi-structured interviews for the student teams.

## **Findings**

The results of the first phase indicated the LAB studio model to be a unique education configuration utilising the studio model as its pedagogical basis. The unique characteristics of LSM indicated it to be more of a workplace-like environment than other studio-based higher education configurations. The results of the second phase indicated the LSM to be a potential configuration for learning the boundary crossing skills, i.e. the skills fostering a T-shaped professional. As new knowledge creation and establishing new contacts for learning purposes require skills for boundary crossing, the results of the second phase indicate activity of boundary crossing inside and also outward from a LAB studio.

As a conclusion, the Doctoral Thesis research results suggest the LAB studio model contributing strongly to the development of boundary crossing skills. Furthermore, the results indicate the potentiality of the LSM for educating T-shaped skills for knowledge workers. Based on the study results of unique characteristics of the LSM, it offers students a work-life like environment and methods for learning, and it includes characteristics of enhancing entrepreneurial competences. The demanding process of producing new and innovative solutions with related business models combined with the competitive internal structure contributes to the boundary crossing inside an interdisciplinary team and also outward from the LAB studio. In addition, since learning is also supported by the conscious support of a student's self-awareness development and development of team working abilities, students are provided with a safe environment to practice their T-shaped skills.

The practical contribution of the Doctoral Thesis research can be utilised by addressing the potentiality and viability of studio model education for the mission of educating knowledge workers in higher education. It contributes new practical information and practices to the knowledge workers education. Especially the utilisation of interdisciplinary education for enhancing student boundary crossing skills is brought to the fore. The results also indicate global unused potential in the studio model for entrepreneurial education programs. In addition, as first proposed by Oonk (2016), the assessment of student boundary crossing competence development would highlight the recognition and importance of T-shaped professionals. Findings of the research also give basis for justifying teacher education in the new learning environments. As teachers act as role models, the ability to coach students to cross boundaries inside and outward from the learning environment is essential.

### **Personal Reflection**

For the universities' mission of developing their education towards the needs of the surrounding society, interdisciplinary studios offer a promising setting. Firstly, the development of skills for T-shaped professionals can be fostered by the studio-based practices and in multi-stakeholder studio environments. Secondly, studios are able to function as an effective interface organisation for bridging the needs of university and society, thus supporting higher educational transitions towards out-of-school readiness. The results of the Doctoral Thesis should encourage the establishment of new studios and the studio model of education to be used more across disciplines, as well as within entrepreneurial study programs. Based on the feedback from the student and teacher interviews, students are mentally ready for the studies in a close interdisciplinary collaboration setting, while teachers instead are more reserved to facilitate such.

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