

This is an electronic reprint of the original article.
This reprint *may differ* from the original in pagination and typographic detail.

Author(s): Seppänen, Ulla-Maija; Heikkinen, Kari-Pekka; Stevenson, Blair,
Title: Oamk LABs
Year: 2016
Version: As published

Please cite the original version:

Seppänen, U.-M., Heikkinen, K.-P., & Stevenson, B. (2016). Oamk LABs. In D. Remenyi (Ed.), *Innovation & Entrepreneurship Teaching Excellence Awards : an Anthology of Case Histories* (pp. 111-126). Reading: Academic Conferences and Publishing International Limited.

Oamk LABs

Ulla-Maija Seppänen, Kari-Pekka Heikkinen and Blair Stevenson

Oulu University of Applied Sciences, Finland

kari-pekka.heikkinen@oamk.fi

1. Introduction

The city of Oulu as a region in Finland experienced an economic downturn between the years 2012-2014 coinciding with the market situation of Nokia. This downturn translated into roughly 3500 unemployed ICT-professionals in the region. Leading up to and during this period, it was evident that cooperation between local public entities such as the city of Oulu, the two local universities and the unemployment office was needed to overcome this challenge. At the same time, the game industry showed to be a promising industry for new employment based on the forecasted growth of business and for adapting the existing expertise and skills of unemployed ICT professionals. A pre-study, initiated in 2011, showed a clear potential for new game professionals in Finnish game companies, resulting in the establishment of the Oulu Game LAB (OGL), a continuing education program for ICT-professionals, by the Oulu University of Applied Sciences (Oamk) in 2012. Today, OGL has grown into a permanent pre-incubator and incubator program and has been joined by two new programs based on the same model - Oulu EduLAB focusing on the global EdTech industry and Oulu DevLAB focusing on the health, energy and environment industries. Together these three programs have come to form an expanding and innovative incubation space run by the Oulu University of Applied Sciences - Oamk LABs.

Oamk LABs (1) can be defined as a pre-incubator and incubator, established to produce promising teams with solid and proven potential for creating their own new business. Studies in Oamk LABs are full-time and are designed for 3rd and 4th year higher education students studying for professional skills in fields such as design, ICT and business.

Oamk LABs is aimed at training new professionals, self-directed teams and new businesses with an industry focus.

Oamk LABs utilize the LAB studio model (LSM) (2), which is a pedagogical model with grounding in studio based learning (3). Studio based learning can be defined as an instructional strategy that provides students with opportunities to engage in relevant and authentic work life learning in a school setting. (4)(5) In other words, a studio based model of educational delivery suggests a more practical approach to professional education. Recent studies (6) have shown the LSM to offer several promising additions compared to existing definitions of studio based learning (7). These additions include: offering a form of instruction that is more competitive in structure in contrast to other studio models; integrating experienced professionals and coaches from the industry; including problems or ideas directly from targeted industries; and building interdisciplinary (8) project teams that cross professional and higher education faculty boundaries. All the factors mentioned above aim to foster an entrepreneurial mindset and engage creative ways of solving problems and creating innovations. The preliminary results of an ongoing study (9) show the growing interest towards the studio based pedagogics in higher education, as well as previous studies (10) (11) have shown an expansion of the learning networks for enhancing the creation of innovations and potential of Oamk LABs to use knowledge creation methods.

As a summary,

The LAB studio model is designed to be a pedagogical model for developing entrepreneurial attitudes and metaskills for worklife, educating self-directed learners, active and concerned citizens, and persons with an opportunity mindset, confidence and tools for co-creation of innovations.

Currently, three LAB studios are operational with each focuses on a certain industry, chosen based on local business development and employment needs as well as the strategic development areas of the host university. Thus, Oamk LABs is providing a bridge between academic and business communities and is unique by supporting students' skills in a full-time environment towards their profession in a context of a small company and interdisciplinary environment.

1.1 Oamk LABs approach to learning for entrepreneurship

In the Oamk LABs, learning for entrepreneurship (12) takes place through learning-by-doing, through the development process of a new solution to a real need, and including incrementally and customer centric developed prototypes and related business plans. The process requires also intellectual and expertise skills, as well as utilization of social networks and the ability to organize a development team and project. The practices used have a goal to increase the skills necessary for creativity, tolerance for uncertainty, curiosity for change, active opportunity seeking and rich communication. Depending on their desire, the ultimate outcome of students' learning for entrepreneurship is the possible establishment of a new business and their own enterprise.

1.2 Oamk LABs approach to innovation and creativity learning

The LAB studio model trains for the skills associated with creativity through solution and business model creation, exploring the need and realizing opportunities into something concrete. In practice, during one or two semesters of Oamk LAB studies, students are creating something unique and concrete in an inquiry-based practice, challenging the status quo and making their own decisions and directions in their team. The development process is happening by an incremental, verifying and customer-centric process using the aspects of Lean Development (13) and Design Thinking (14) at its core. The process takes place in an environment tolerant of failure and, assisted by the coaches, students are learning positive attitudes, practical skills and processes towards everyday creativity - essential for future professionals to develop work-life practices and create new solutions.

2. The infrastructure

Student teams in LAB studios are diverse since they are interdisciplinary, intercultural and intergenerational. Teams usually have members from three to four different professions, two to four countries with English as the common language and the ages between of 22-55 with expertise not only in solution development, but also industry specializations and business development. This wide range of experience and expertise is expected to cover the key areas of competences necessary for establishing new ventures (15), and for the industries in focus. The development process towards the solution and business model is made by using the aspects of

Lean Development and Design Thinking at the core. The development is done in two weeks cycles, in which the speed of development is essential and decisions for new targets are done based on the learnings from the previous cycles.



Figure 1: A LAB student team from spring 2016. Countries represented: Italy, Finland, Iraq, Russia, Netherlands and Thailand.

Developing new innovations requires the right combination of expertise. This kind of expertise is based on teamwork and networking. Therefore, studying in Oamk LABs is completely based on working in an interdisciplinary team and it is done in an unfamiliar and challenging context which requires students to apply and recognize their knowledge and share it with students from other fields. In Oamk LABs, the aim is to educate self-aware future professional since it is evident that high self-awareness leads to better team performance. Based on our experiences and trials, the suitable size of a LAB cohort is defined to be between 30 to 40 students. In our experience, this amount of students ensures the strong formation of a multi-dimensional LAB community, thus enabling the learning community. On the other hand, the number of students in a studio environment should be limited from the tutoring and coaching point of view in order to ensure a personalized touch and ability to effectively individualize the learning experience of participants.

During the first four month period upon entering Oamk LABs, the Demo-part, projects produce a verified demonstration of a solution and business model from an idea or a problem via a concept proposal. Since the LSM is using the principle of 'Fail Fast, Learn Fast', only those projects deemed to be most viable succeed on the Demo-part and get an invitation to the second round of Oamk LABs, the Product-part, for continuing their development work in a second semester. In the Product-part, teams are offered coaching, tools and premises to develop their demonstrations to a launchable product with a solid business plan. Since the students own their intellectual property, this kind of program is also allowing for the establishment of a new startup enterprise based on their work. After their studies in Oamk LABs, teams have a chance be selected to partner business accelerator programs nationally and internationally. These accelerators are privately owned and act to support the business internationalization and growth of startup enterprises.

Since the LAB studio model offers a form of work-life experience, individual students and teams are supposed to work in close collaboration with each other as if in a small company environment. In Oamk LABs, student teams arrange the premises, including the seating structure and space usage, according to their needs and organize their work independently with assistance from the coaches. Project teams gain 24/7 access to the premises and have full control of the equipment and aesthetics of their space. The working space consists of rooms of different sizes for the project teams and individuals, enabling sharing in formal and informal ways. By keeping the LAB studio doors open, opportunities are encouraged to meet and respond to unexpected visitors and supports an open development environment. In fact, visitors in LAB studios are treated as potential customers and as a source of new knowledge and feedback.

As of the fall 2016, the three Oamk LABs premises are located in separate facilities. Oulu EduLAB is located at the university's campus building associated with media, performing arts and ICT studies, while DevLAB is located in a downtown urban office hub in cooperation with a city incubator facility called Business Kitchen (16). This facility supports the development of entrepreneurial competences and includes activities from the two local universities, student organizations, several startup companies, as well as public organizations supporting the creation of new companies in the region. Oulu Game LAB is located in the city's new downtown 'Game campus' (28) which houses both the Game LAB and the offices of a number of

local game companies. This new facility is expected to support the expansion of game industry activities and growth. Overall, new startup enterprises established through Oamk LABs remain in close connection to the LAB studios, thus enhancing collaboration and networking between students, startups and professionals.

Practical connections to work-life are supported in the LSM by many ways. The problems being solved by student teams are most often provided by local and international partner industry companies or organizations. Additionally, the coaches working in Oamk LABs are responsible for preparing the problems for the teams together with the industry professionals and ensure that challenges of the projects are enabling professional learning. The industry connection is maintained also during the concept development and prototype development phases and also at the end of a LAB as a final 'pitch' when teams introduce their solutions and business plans to industry professionals. Informal connections with work-life are emphasized by organizing common events, seminars and happenings when social interaction, networking, informal peer-coaching and critique or constructive feedback is promoted. Industry support also takes place during frequent visits by professionals to the LAB studios. These visits are often used for industry feedback opportunities, which in many cases lead to team mentoring by the industry professionals.



Figure 2: External industry experts listening to presentations and giving critique to student teams.

Oamk LABs uses a competitive internal structure for raising the quality, leading to only the best concepts and projects being selected for continuation. The decision for choosing the best projects is done by external industry representatives during a special organized pitching event, called Gates. The selection of teams to proceed is done based on the team's presentation of the viability of the concept or project, whether the solution fits to the need, the related business opportunity, and the team's proposal to realize the outcome. By developing this structure, Oamk LABs offer a safe environment to perform in uncertainty and handle the frustration and disappointment if a concept is cancelled. Along with Gates, many other presentations are completed during the development phases of the LAB. After presentations, feedback is given on the solution and the business by peers and LAB coaches, enabling a strong culture of feedback and support.

Training university staff for entrepreneurship education is essential to the successful delivery of this type of education (17) as noted by Bull and Whittle (18) when describing studio based education models. The Oamk LABs staff has been educated to work and teach within the LSM through a specific training program which includes intensive, practical and theoretical coverage of learning practices in the model. The emphasis on learning by doing, rather than having lectures on theory and methods, requires the skills of a consultant / coach rather than a traditional teacher. In fact, commonly at the beginning of the training program, coaches as taken through a model LAB experience to explore the process of concept development like a student would. By experiencing the model first, coaches are able to better align their own teaching later to the needs of a student team and individual students.

3. Challenges

During the four-year development of the LSM, there have been several challenges to overcome. One challenge has been to explore the LSM suitability for supporting prototype design for products other than digital products and services. For example, few individual projects during the LABs have focused on producing concrete demos (e.g. hardware / machine production), with the majority of projects focusing on digital prototypes and products. The upcoming pilots for development during the autumn of 2016 will pilot the development of concrete products and related business models for industries such as green sustainability and the recycling industry. An additional challenge is exploring the LSM's suitability for the needs of more

traditional industries, such as construction and machine engineering. Based on a review of results from other studio based programs (9), promising examples exist in other universities which Oamk LABs will learn from.

Challenges have also been seen in the generalization of the LSM within the larger university in terms of ensuring student numbers and internal funding. Due to the recent economic challenges in Finland and Europe, financial cuts in higher education have represented a hurdle and led to difficulties piloting and developing new innovations. To overcome this challenge, external funding has been secured for the development of Oamk LABs since the beginning of the LSM development to supplement the internal core funding provided by the university for managing the program. Also, the increase of an awareness of the LSM inside the university has been essential for an increase in staff acceptance, thus a continuous education process has taken place for the Oamk staff relating to the entrepreneurial mindset and LAB studio model during frequently organized events inside the university and among local and national industry partners.

The LSM was created and developed in connection to agile methods and is intended to be a dynamic education model with substantial freedom of operation. The strong role of LAB masters as the incubator managers for each of the LABs enhances the fast decision making and will ensure the agile nature of the model. Still some common operational rules have been established in order to balance this management structure inside the university's organization. However, the LSM was established from the industry perspective, so keeping the principle of industry focus and alignment will maintain the LSM as a dynamic and cooperative program.

Overall, the initial challenge causing the need for the LSM - the downsizing of Nokia in the city of Oulu - in fact created the conditions necessary for a rapid growth for startups and an opening for other ICT companies to take advantage of the extensive expertise present in the city. This growth has led to the city of Oulu regaining a high level of employment in the ICT industry and aiding the conditions for a vibrant city with strong cooperation between local public and private organizations. In addition, this change has supported a strong momentum and motivation for challenging the traditional structures and methods in higher education. Maintaining the same entrepreneurial attitude between the collaborators is a key enabler for continuing the development and growth of Oamk LABs.



Figure 3: A LAB participant giving a pitch during a Gate 2 event

4. Learners feedback

Student feedback about Oamk LABs has been continuously collected through tools such as regular online questionnaires conducted with participants since the LABs' start in 2012. This feedback form has been the same during the years and it has been sent to all students while studying per semester with a response rate between 40-70%. The questions in the form focus on the methods, coaching, events, and learning in a LAB studio, with two numerical questions focusing on a general rating of the program. The summary of the questionnaires (19) show a strong result, since on the scale of 0-10 the average score has been between 8 and 9 since the establishment of the Oamk LABs. The open question asked has been; "What would you tell to your friend about Oamk LABs?" The majority of the student answers refers to the fact that Oamk LABs has a significant positive impact on studies, i.e. in contrast to the traditional way of teaching. All responses have recommended Oamk LABs as a good place to learn about students' career choice industries. The feedback has also suggested that the LABs offer a new way of learning to students which, once they experience it, they are positive as demonstrated by the following quotation from a participant:

"Another effect of the LAB Studio Model was that teachers act in the role of coaches. For me this was a new way of studying... I totally support this equality between teacher and student because in

my experience the learning effect was higher. Sometimes I wished that the coaches just tell me what was the right thing to do, which decision we should make, what direction we need to go with the project, but they just asked questions to push ourselves through it in our own individual way. This was frustrating, interesting, annoying, challenging, helpful and very efficient." (Participant, 2016)



Figure 4: A LAB participant and his coach working together.

Furthermore, students regularly share how the LAB experience encourages them to be critical thinkers and to better work in teams as outlined in the following quotation:

"In order to think of potential solutions for our challenge, we placed a huge emphasis on the critical thinking process. We were able to come up with new ideas, criticize them as much as we could from all areas such as from a business or development standpoint, and then we would research heavily what would need to be done to make the product/service and if there were any similar devices and their downfalls." (Participant, 2016)

Feedback from the industry can be seen in a number of ways, such as from the organizations and companies supporting Oamk LABs by donations, through the willingness to join the events and to coach student teams on their own volunteer time. Organizations include actors such as the Oulu Innovation Alliance (20), Business Oulu (21), Centre for Environment and Energy (22) and Oulu Center for Health Technology (23). In addition, industry

representatives from over 20 different companies offer relevant keynotes while participating in the Oamk LABs events and giving problems for the student teams to solve.

As a part of the mechanisms for collaboration and feedback, Oamk LABs has two steering groups (SG); for internal and external development. The role of the internal SG is for the development of interdisciplinary practices within the university. The group consists of three University Department heads and the Chairman of the Student Union Board, as well as two LAB alumni, a student and an entrepreneur. The role of the external SG is for adjusting the model to address industry needs. The SG participants come from industries, as well as public organizations and the student union. The chairman of the steering group is the CEO of The Federation of Local Enterprises while other members include industry representatives, a representative from Business Oulu, as well as a member from the student union board, in addition to the Oamk Vice Rector and Head of Department. These SGs allow for the model to closely align with the industries and Oamk internal practices and structures.

5. Learning outcomes

Based on the Oamk internal statistics (24) between the years 2012-2015, Oamk LABs resulted in:

- Roughly 600 new trained professionals, over 15000 ECTS credits
- 152 new concepts, 59 prototype demonstrations
- 14 new startup enterprises.

These promising figures have offered strong evidence for Oamk LABs continuing role for training and collaboration with the local unemployment office, while utilising the model for educating unemployed professionals to enter new industries. Five out of 14 startup companies mentioned above have been selected to private business accelerator services, (25) (26), and have received funding for their business growth.

Internally at the Oulu University of Applied Sciences, six externally funded projects have also been established since the year 2014, granting 1.6 million euros in total for Oamk LABs development, staff education and expansion of the LAB studios.

On the international level, five formal LAB studios outside the city of Oulu have been established since 2013 to form a national and international

network of LAB studios. LAB studios are listed below in order of their establishment:

- Global LAB in the City of Sendai, Japan
- Jyväskylä Game LAB in the City of Jyväskylä, Finland
- Groningen Game LAB in the City of Groningen, Netherlands
- Centria Game LAB in the City of Ylivieska, Finland
- Timisoara Game LAB in the City of Timisoara, Romania.



Figure 5: LAB Masters from Japan, Romania and Finland meeting each other, spring 2016.

Negotiations with several other universities inside and outside Finland are ongoing for the establishment of additional cooperative LAB studios. In addition to common development projects, the cooperation of LAB studios covers the exchange of students, virtual student teams, shared projects and coaching between the LAB studios. Also, established startups are utilizing the network for their game and business development by undertaking surveys, user testing and pre-studies for localization and research. Furthermore, Oamk LABs has developed an internal university research group conducting and supporting academic and applied research taking place within Oamk LABs.

The research group's key topics are:

- Entrepreneurship education;
- Innovative and inspiring pedagogy; and
- Digitalization and internationalization of interdisciplinary learning environments.

The LAB research group's target is to develop the model and disseminate our results in order to contribute to and develop high level academic and applied discussions about education focusing on entrepreneurship, innovation and work-life skills. Additionally, the group intends to expand the number of Oamk staff engaging in related research, graduate studies and increased collaborations between Oamk and other national and international research organizations. The group will also pursue funding and projects to support these activities. Currently, this group includes ten active members in Oamk and is networked with three external universities.

Oamk LABs has also been externally acknowledged to be the most innovative higher education model in Finland in 2014 when the LAB studio model was recognized for its "Innovation & Entrepreneurship Teaching Excellence". This promotion was made by the network of Innovation and Research Leadership Group of Finnish University of Applied Sciences together with the Rectors' Conference of Finnish Universities of Applied Sciences (27). The award was nominated under the category of Renewal and Development of Worklife and Education Cooperation.

6. Plans for further development

Studio based learning continues to be one of the most effective pedagogical methods to combine theory and practice in higher education. The LAB studio model (LSM) represents the most comprehensive example of utilizing studio model practices in entrepreneurship education in Finland and globally. The development of Oamk LABs and the LAB studio model at the Oulu University of Applied Sciences will continue to expand over the coming years as outlined in a strategic plan and as encouraged by the growing number of public and private partners supporting this initiative. At the core of this plan is the desire to better understanding the needs of the work-life and local industries, and the development of methods and contents for inspirational learning. By broadening its national and international learning networks, Oamk LABs will enhance the learning for an entrepreneurial mindset and creative confidence among the participating students.

At the practical level, the development of Oamk LABs will expand through the following:

- cooperation with the other entrepreneurship education programs in Oamk;

- continuing the research group activities to conduct studies around LSM;
- increasing Oamk LABs interdisciplinarity by inviting students and coaches from new degree programs in Oamk and other universities;
- piloting new LAB studios within new industries nationally and internationally;
- helping to set up new LAB studios abroad in addition to the existing network of cooperation in countries such as Japan and Netherlands; and
- continuing the collaboration with private startup accelerators.

Overall, Oamk LABs will continue to bring together students, coaches, startups and more advanced companies, and is a practical example of the university's ability to respond to work-life needs and entrepreneurial skills education.

References

- Oamk LABs, Web pages: <http://oamk.fi/labs>
- Heikkinen, K. (2014). Introduction to LAB Studio Model. ePooki. Oulun ammattikorkeakoulun tutkimus- ja kehitystyön julkaisut 19. Available: http://www.oamk.fi/docs/hankkeet/OGDA/LAB_Learning_Model_Introduction.pdf
- Lackney, J. (1999). A history of the studio-based learning model. Educational Design Institute, Mississippi State.
- Boyer, E. L., & Mitgang, L. D. (1996). Building Community: A New Future for Architecture Education and Practice. A Special Report. California Princeton Fulfillment Services.
- Burroughs, S., Brocato, K., & Franz, D. (2009). Problem based and studio based learning: Approaches to promoting reform thinking among teacher candidates. In National forum of teacher education journal (Vol. 19, No. 3, pp. 1-15).
- Heikkinen, K-P., Stevenson, B. (2015) 'The LAB studio model: enhancing entrepreneurship skills in higher education', Int. J. of Innovation and Learning, In press.
- Bull, C. N., Whittle, J., and Cruikshank, L. (2013). Studios in software engineering education: Towards an evaluable model. In: 35th International Conference on Software Engineering (ICSE), 18-26th May, 2013, San Francisco. pp. 1063-1072.
- Klein, Julie Thompson. Interdisciplinarity: History, Theory, and Practice. Detroit: Wayne State University, 1990.
- Heikkinen, K-P., Seppänen, U.-M. and Isokangas J. (2016) "Review Of Studio Based Learning Practices In Higher Education", Manuscript.
- Heikkinen, K-P., Seppänen, U.-M. and Isokangas J. (2015) "LAB studio model: Developing external networks for learning entrepreneurship in higher education", Education in the North, Vol 22 (Special Issue), pp 49-73.

- Heikkinen, K-P. and Räisänen T. (2016). Knowledge creation in LAB studio educational settings. Manuscript.
- Kyrö, P., & Ripatti, A. (2006). Yrittäjyyden opetuksen uudet tuulet. In P. Kyrö & A. Ripatti (Eds.), Yrittäjyyskasvatuksen uusia tuulia. (4/2006 ed., pp. 10-31). Tampere: Tampereen yliopiston kauppakorkeakoulu.
- Womack, J. P., & Jones, D. T. (2010). Lean thinking: banish waste and create wealth in your corporation. Simon and Schuster.
- Brown, T. (2008). Design thinking. Harvard business review, 86(6), 84.
- Timmons, J. A., & Spinelli, S. (1994). New venture creation: Entrepreneurship for the 21st century (Vol. 4). Burr Ridge, IL: Irwin.
- Business Kitchen, universities' entrepreneurship hub, Web pages: <http://www.businesskitchen.fi/>
- Schön, D. (1983). The Reflective Practitioner. How Professionals Think In Action. (p. 374). Basic Books.
- Bull, C. N., & Whittle, J. (2014). Supporting reflective practice in software engineering education through a studio-based approach. IEEE software, (4), 44-50.
- Oamk LAB's Student Feedback Statistics (2016), Oulu University of Applied Sciences (Oamk), Internal document.
- Oulu Innovation Alliance, Web pages: <http://www.ouluinnovationalliance.fi/>
- Business Oulu, City of Oulu Business, Web pages: <http://www.businessoulu.com>
- Centre for Environment and Energy, Web pages: www.cee.fi
- Centre for Health Technology, Web pages: <http://cht.oulu.fi/>
- Oamk LAB's Yearly Statistics (2016), Oulu University of Applied Sciences (Oamk), Internal document.
- Nestholma startup accelerator program, Web pages: <http://nestholma.com/nestholma-oulu/#.VzWZ8hV96Rs>
- Game Brewery accelerator program, Web pages: <http://www.businessoulu.com/fi/yritysverkostot/game-brewery-oulu.html>
- Arene, the Rectors' Conference of Finnish Universities of Applied Sciences, Web pages: <http://www.arene.fi/en>
- News of the local newspaper, Kaleva: <http://www.kaleva.fi/uutiset/oulu/ammattikorkeakoulun-oulu-game-lab-mukaan-oulu-pelikampukselle/718464/>

Author biographies



Ulla-Maija Seppänen is a Master of Health Sciences (MSc), Occupational Therapist (reg.) and Psychotherapist. She has a strong background in therapeutic practices as well as developing new teaching and learning methods. She is currently Senior Lecturer and Head Coach at Oamk LABs in the Oulu University of Applied Sciences, Finland.

Ulla-Maija Seppänen, Kari-Pekka Heikkinen and Blair Stevenson



Kari-Pekka Heikkinen (MSc tech.), has work experience including electrical engineering, project, staff, business and product management and product concept development at Nokia Corporation. Currently, he is a Senior Lecturer and Project Manager at the Oulu University of Applied Sciences, and finalizing his PhD at the Industrial Engineering and Management department at the University of Oulu.



Blair Stevenson (PhD) has a background in teacher education and education evaluation. He is currently working as a lecturer and Oulu EduLAB manager in the Oamk LABs at the Oulu University of Applied Sciences, Finland. He is also coordinator of the university's LAB research group. His own research focuses on topics such as interdisciplinary education, action research and video-enhanced teacher development.