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# Oamk LABs practices for bridging work life 21th century skills and higher education

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## Problem and context

The demand for professionals who are able to create new solutions and innovations across disciplines, professions and perspectives is increasing. Innovations are needed for creating economically and ecologically sustainable communities (Capra 2007; Dumont and Istance 2010) and they are dependent on the capacities of people, organizations and networks to create and utilize knowledge (Boreham and Lammont 2000). Practitioners are functioning in societal structures and organizations that are constantly changing since expertise is no longer manifested exclusively in performing known tasks in a particular setting. Challenges that often cannot be addressed by routine solutions are constantly arising. These challenges have to be addressed by experts from different fields collaborating across different contexts (Engeström, Engeström and Kärkkäinen 1995; Tynjälä

1999). These are often called wicked problems, as they are characterized by confusing data, multiple users with differing values and not having a right or wrong answer. Furthermore, any possible explanation for one of these problems is strongly dependent on the worldview of the designer (Buchanan 1992).

The development in society and the economy described above requires that educational systems equip young people with the right competences that include attitudes, skills and knowledge to allow them to contribute actively to economic development under a system where the main asset is expertise. These skills and competencies, 21st Century Skills, are closely related to the needs of emerging models of economic and social development than with those of the past century, which were more suited to an industrial mode of production (Ananiadou and Claro 2009). Universities and institutions for vocational higher education are all challenged to educate these knowledge workers, since students of vocational education today are expected to function in a knowledge-based society.

As questioned by Ritchhart (2002),

*“What if education were less about acquiring skills and knowledge and more about cultivating the dispositions and habits of mind that students will need for a lifetime learning, problem solving and decision making? What if education were less concerned with end-of-year exam and more concerned with who students become as a result of their schooling? What if we viewed smartness as a goal that students can work toward rather than as something they either have or don’t have?”*

We, the authors, believe that 21st Century Skills represent the lens through which to address these questions. This article is an overview of the case of Oamk LABs which educates for those skills in higher education within a LAB studio model educational setting. The skills described within Oamk LABs education case, include descriptions of key practices as well as Oamk LABs student experiences with quotes from self-evaluations, course feedback or thesis work.

## Studio pedagogy and LAB studio model

### Studio based pedagogy

Studios have been used for educational purposes for centuries and can be traced to Middle Age schools of art and architecture. Today, besides the worldwide usage of studios in those schools, central features of the studio model of education hold interesting possibilities for education in other fields of vocational education as well for example in computer science (Kuhn 2001; Bull and Whittle 2014; Carter and Hundhausen 2011).

Studio based pedagogy can be defined as an instructional strategy that provides students with opportunities to engage in relevant, authentic learning in a school setting (Boyer and Mitgang 1996; Burroughs, Brocato and Franz 2009). The basic objective of the studio is to practice professional skills in small groups where one’s professional skills are challenged by others both peers and mentors (Schön 1983,1987). Studio based pedagogy is a constructivist approach, utilising project based learning (Blumenfeld et al., 1991). Also the approach of learning-by-doing, initially promoted by John Dewey (1897), is also a critical pedagogical principle. In this way, studios parallel the need for collaboration and creativity existing in workplace environments in the creative disciplines, design, art, etc. Traditionally, studios focus on visually centred work; and “reflective practice”

(Schön 1987) observing and refining practice in a continuous cycle, supported by coaching and peer learning.

Studio based pedagogy suggests a more practical approach to professional education. Schön (1983) summarizes this process as reflective practice or “knowing and reflecting-in-action”. Pakman (2000) adds that this model of learning can allow practitioners to reconstruct their theories of action making and form action strategies explicitly open to criticism. This process is aligned with the knowledge creation practices, e.g. SECI-model (Nonaka and Takeuchi 1995). Another aspect of the studio model is the use of real world problems around which teaching is constructed (Schön 1985). Overall, research related to design education suggests that studio based pedagogy is an effective method for cultivating students’ identities as designers, developing their conceptual understanding of design and the design process, and fostering their design thinking (Kuhn 1998, 2001; Schön 1983).

### LAB studio model characteristics supporting connection to work life

The LAB studio model (LSM), as a pedagogical model utilising studio based pedagogy, is a higher education model aimed at training competent new professionals, self-directed teams and new businesses. The recent publication by Heikkinen and Stevenson (2016) has shown LSM to include several new factors compared to existing definitions of studio based learning such as by Bull, Whittle and Cruickshank (2013). According to Heikkinen and Stevenson (2016), these factors include:

- offering a form of instruction that is more competitive in structure in contrast to other studio models (competitiveness);
- integrating experienced professionals and coaches from the industry (work-life connection);
- including problems or ideas directly from targeted industries;
- building project teams that cross professional and higher education faculty boundaries (interdisciplinary).

The factors above described factors support the development of T-model learners and 21st Century Skills. Professionals having T-shaped skills “are deep problem solvers in their home discipline but also capable of interacting with and understanding specialists from a wide range of disciplines and functional areas” (IfM and IBM 2008).

LSM supports the work-life connection through various themes. By being intergenerational, interdisciplinary and international, project teams are connected to diverse expertise and experiences. The project based learning method involves interaction with an external client and starting from the problem connects both students and coaches to the industry, as well as the reflective practice given by industry participants. New knowledge is created in organised and impromptu common happenings where social interaction, networking, informal peer-coaching and critique or constructive feedback is promoted.

LSM is founded on two values: Trust and Care. In general, these values reflect the LAB’s inherent entrepreneurial thinking and approach to problem solving. Among other things, the value ‘Trust’ refers to the fact that students are trusted to do their best towards the common goals defined within

their team, leading to trustful and equal relationships, which also concern staff of the LABs. The value 'Care' means taking proper care of everyone and everything involved, from the educators and students to the development and learning results of the projects and teams. This value also emphasises tutoring as a means for ensuring professional growth during and after the LAB studies (Heikkinen 2014). Failures and mistakes are considered an essential part of the learning. Students have to face the challenges, practice and find new solutions after they have recognised their mistakes. Learning and success is a result of effort and self-inquiry. This is viewed as the way to support students to become more independent learners (cf. Dweck 2009; Saavedra and Opfer 2012).

## Oamk LABs Studies

Established in 2012, the Oamk LABs are a higher education program offered at the Oulu University of Applied Sciences (Oamk) in Finland. This program is based on the LSM and is a full-time, interdisciplinary, international and intergenerational program to train new professionals and build new businesses. The Oamk LABs can be characterized as pre-incubators (Heikkinen, Seppänen and Isokangas 2015) where students are working together in interdisciplinary teams to build real prototypes, products and possible startups. As of January 2016, Oamk LABs consists of three LAB studios (LABs) each targeting a specific global industry: Oulu Game LAB (games industry), EduLAB (edtech industry) and DevLAB (health, energy and environmental industries). The Oamk LABs program is taught in English and currently brings together roughly 150 students from around the world, with a new cohort joining the LABs every semester.



Picture 1: A LAB

Master advising a student.

The first part (one to two semesters) in Oamk LABs consists of two main phases: a concept development phase, called LEAD, and a demonstration development phase, called LAB. In the LEAD-phase students produce concepts for needs provided by existing companies, organisations or from the participants themselves. The concepts are presented in specific events called Gates. (Heikkinen 2014). In the LAB-phase, larger teams are formed to develop demonstrations (demos) of the concepts and a related business model. The LAB-phase and the first semester ends with a final presentation event, which is open for all the students and LAB staff, as well as for

professionals from the industry. In the events, student teams present their solutions and business models to receive customer oriented and professional feedback. The second semester is optional for the teams which are willing to continue developing their demonstration into a more complete product and it includes more focused business and product delivery coaching and connections to the industry.

The students participating in Oamk LABs in Spring 2016 were from various fields of study and represented over 30 different nationalities. The fields of study were teacher education, software engineering, business development, graphical design, social work, occupational therapy and physiotherapy with the addition of unemployed professionals. A wide range of experience and expertise is expected to cover the key areas of competences necessary for establishing new ventures (Timmons and Spinelli 1994) – startup companies for the industries in focus. This also brings possibilities for students to gain valuable skills:

*“Working in an interdisciplinary team has been new for me. This might have been the best experience I’ve had in DevLAB. Learning about each other’s background / culture was really important for me. This way of group work also improved my competences about responsibility and organizing, because every culture and background needs another kind of behavior.” (Industrial engineering student, The Netherlands)*

Each Oamk LABs studio is led by a LAB Master. Together with coaches and tutors the LAB Master acts as a supervisor of learning and directs the students to find and build new knowledge and to commit them to work toward the promotion of learning. The staff has the responsibility of supporting student development, both in terms of specific professional career goals and in their project task and goals (Heikkinen and Stevenson 2016). Additionally in studios, coaching often requires the improvisation of teaching (Sawyer 2004). At Oamk LABs this calls for variations of methods used at the moment of coaching.

As a result, over the four years that the model has been developed a significant amount of students, credits and companies have been achieved. Based on the Oamk internal statistics (Oamk LAB’s Yearly Statistics 2016) between the years 2012-2015 Oamk LABs resulted in: roughly 600 new professionals, over 15000 ECTS credits, 152 new concepts, 59 demonstrations and 14 new enterprises. Oamk LABs has also been externally acknowledged to be the most innovative higher education model in Finland. In 2014 the LAB studio model was recognized for its “Innovation and Entrepreneurship Teaching Excellence” and in 2016 Oamk LABs received the second highest honour at the European Conference on Innovation and Entrepreneurship conference award for Innovation and Entrepreneurship Teaching Excellence (ECIE 2016).

## Learning and 21st Century Skills

Twenty-first Century Skills or competences are described by various sources (Ananiadou and Claro 2009; Binkley et al. 2012; Burkhardt 2016; Dede 2009; P21 2011). In Oamk LABs, these competences are seen as a dynamic combination of knowledge, attitude and skills (c.f. Ananiadou and Claro 2009). The competence areas at Oamk LABs are presented in Figure 1. We believe that the development of these six competence areas leads to a future professional mindset where the core is a positive attitude towards innovation and development. The facets of the future professional mindset are: confident person, concerned citizen, self-directed learner and an active professional.

For each competence area, the model uses various learning methods and methods often overlap several competence areas.



Figure 1: 21st Century Skills at Oamk LABs  
Communication and collaboration

Professionals focusing on knowledge economy work require efficient skills for communicating and for working in teams. The ability to collaborate with others is one of the most important 21st Century Skills and also important for active lifelong learning (Saavedra and Opfer 2012). Future professionals need to be able to communicate face to face, by using distance communication tools and in different languages. They need to be clear both orally and in writing when using professional language to be able to influence and persuade others. They need to have effective team working skills: the ability to relate with others, to have patience with others, to trust others and skills to present, negotiate and listen actively (Dede 2009).

When working in teams at Oamk LABs, students have to overcome the lack of a shared vocabulary and different communication cultures. Because of the so-called disciplinary “silos” (Ashcraft 2011; Cohen and Lloyd 2014), students from different professions are speaking different professional languages. In order to work and develop concrete, user-centred projects and products in cooperation, students need to learn to understand each other’s professional terms and meanings and the way of communicating. Students also recognise the learning in themselves:



*“Regarding communication and collaboration I feel that I have made significant improvements during Devlab. Working (...) has improved my overall team working skills, but also improved my personal communicational skills as well. I am more ready to start conversations both regarding project and other non-project related things as well.” (Master of Science Information system design Oamk Open University student, Finland).*

Students learn how to observe body language and acquire skills to know how and when to show empathy. During the LAB each student gives multiple presentations. This is one way to learn how to communicate information and ideas to different audiences using a variety of media and presentation formats. Additionally, students develop networks in order to build collaboration that supports their future careers. During studies in Oamk LABs, the students’ learning network expands significantly (Heikkinen et al. 2015).

## Disciplinary knowledge

Students at Oamk LABs are usually 3th or 4th year Bachelor or Master degree undergraduate students. Before joining a LAB, students need to have solid knowledge in their own discipline since during the LAB program they need to bring the skills and knowledge of their own profession into an interdisciplinary team. Students must use a wide range of content knowledge within their disciplines and profession: existing disciplinary knowledge, expertise, skills, networks and communities, professional interest areas and understanding of the future challenges in the field, and professional and research approaches.

While working as part of an interdisciplinary team, students learn how to apply and deepen their disciplinary knowledge and professional roles. Each student and profession is served by coaching specifically targeting his or her professional roles. Projects are also served by mentors to ensure an industry customer relationship (Carnell, MacDonald and Askew. 2006). Coaching and mentoring is performed by the teachers and external experts. The learning process is viewed as a process of learning and building new knowledge, which is shared within and between professions as peer--learning (c.f. Boud, Cohen and Sampson 1999; 2014). The challenge has been ensuring that the learning of disciplinary topics of the curriculum studies fit with the requirements from the degree program. The solution for the above challenge has been to create an agreement associated with the individual learning objectives for each student together with their personal goals and a commonly defined curriculum together with the degree programs and Oamk LABs.

Teamwork 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. They learn about other professions, but most of all about their own profession and how they as representative of his/her own profession can contribute as a team member. Furthermore, students learn T-shaped skills which are required in order to effectively interpret and utilize unfamiliar knowledge for exploration focusing on gaining new knowledge aimed at innovation (c.f. Hamdi, Silong, Omar and Rasid 2016). Students are also gaining experience about how work should be done and divided for the best result from the product development point of view, such as demonstrated by the following lead software developer:

*“...the thing that I learned is how to split the work among developers, making sure that not only everybody gets a fair share of the work, but also importantly, that our works do not conflict with each other’s when we merge our work tighter.” (Information Technology student, Lithuania).*



According to Litendahl (2015) and Perka (2016), studying at Oamk LABs develops disciplinary competences and even new, future-related competences (Litendahl 2015) as well as knowhow to use disciplinary competences become wilder (Perka 2016).

## Responsibility and global awareness

To effectively develop user-centred innovations, professionals need to have the ability to empathise and share the pain of the user. This means courage to respect differences of cultures, ways of living and values of people (c.f. Ikeda 2005). When truly doing this, professionals become more aware about the global needs, limitations, opportunities and future trends. Responsibility becomes a personal obligation to be productive, including intrapreneurship and entrepreneurship, and the work has to respond to the needs of the customer.

Sustainability is a central theme in DevLAB for the academic year of 2016-2017. Sustainability is accepted nowadays as a guiding principle by public policy making and companies (Finkbeiner, Schau, Lehmann and Traverso 2010). Moving towards the goal of becoming more sustainable requires fundamental changes in attitudes and behaviour. Every student learns accountability, personal and social responsibility and being a responsible team member. For many students, the way to approach clients and customers to find solutions for real life problems is different from what they have had before:

*“Now I know how to ask the right questions without leading (myself or the person to interview) too much to the solution that I have on my mind. This enables me to get the honest answers to the problem I’m solving.” (Business information systems student, Finland).*

One practice used to become more aware about global issues and responsibility is a *Megatrends workshop*. Within *Megatrends workshops* students deepen their knowledge about a global megatrend, which is connected to the actual problem they will be dealing with later in the program. During the spring 2016, key megatrends that students were studying were: aging, urbanisation, decline of resources, digitalisation, global environmental change, rising healthcare costs, the changing nature of work and the rise of personalisation. Students got familiar with the megatrends during the first week of the semester and they prepared short presentations for the group. This was one way of preparing students for the mindset of being active and using all available expertise in the LAB. At Oamk LABs new knowledge is created in cooperation between students, coaches and work-life partners, thus forming a community of learners (c.f. Brown and Campione 1994; Rogoff, Matusov and White 1996). This allows students to create some common understanding about the world.

## Creativity and innovation

According to the organization Partnership for 21st Century Learning (P21 2004), there are three skills essential for creativity and innovativeness: thinking creatively, working creatively with others and implementation of innovations. In order to think creatively one needs to use a wide range of idea creation methods or techniques. Future professionals have to know how to create new and viable ideas both by themselves and as part of different teams. To work creatively with others means developing, implementing and communicating new ideas effectively to others. Future professionals need to be open and receptive to new ideas and diverse perspectives. They also need to have a mindset that being creative and innovative is a long-term cyclical process, floating between mistakes and success. They also have to tolerate that it could take a lot of time to create

something real, unique and useful. This happens only if one is curious and ready to take some risks. In order to be able to think and act like this, the professionals have to have creative confidence – a mindset to see one’s own creative potential (c.f. Kelley and Kelley 2013).

Learning by doing as a work-based learning method has been recognized for a long time as an important way of learning innovation creation (Toner 2011). Learning in Oamk LABs is strongly based on the concept of learning by doing; developing a concept for a product or a service. In Oamk LABs, the *Concept Development Process* has been used based on the Design Thinking (Brown 2008) methodology in the academic year 2015-2016. This process was an experiment to see how Design Thinking fit in with the LAB Studio Model. Students were creating solutions for various different user groups and needs well outside of their own experience. The concept development process, not based on any of the fields of the students, is an equalizing force that allows everyone to participate. The promise of design thinking is that anyone can do it if they follow the mindset. For the spring semester 2016, the concept development process was fully implemented and realized as two subsequent cycles though the design thinking modes during the Lead phase to create a solution concept (Karjalainen 2016).

### Critical thinking and civic literacy

Open-mindedness, flexibility, willingness to self-correct and pursuit of consensus are needed skills for future professionals. These are also characteristics of a critical thinker. Professionals, who are critical thinkers are motivated to exercise the effort needed to work in a resourceful manner, to check for accuracy, to gather information, and to persist when the solution is not obvious or requires several steps (Halpern 2003). Critical thinking uses evidence (Halpern 2003) and that is why it is connected to skills of civic literacy.

The aim of learning critical thinking is to help students to develop their abilities to reason, analyse, evaluate and create. Students need to develop these abilities and at the same time learn to express one’s feelings, thoughts and actions in a way that is rational and clear (Mulcahy 2008). Learning critical civic literacy enables students to question the assumptions that undergird current ideas, practices, policies and structures (Teitelbaum 2011). These are skills needed when students are identifying and defining problems from partners, collecting and analysing data (e.g. identifying existing problems and already made solutions for them in order to find the real problem behind the problem). An essential component for the future work is that professionals are encouraged to think and use their skills in different situations and environments (e.g. skills transfer).

Coaching provides opportunities to learn critical thinking skills. In *Open Coaching Sessions* students are challenged to discuss, ideate and find new points of views. Both staff members, students from different LABs and external coaches gather together to exchange ideas. Another coaching practice is *Professional Coaching* within which students of a specific field or profession have either an expert from the industry or coach from the university staff focusing on their specific professional issues and challenges. With the help of coaching, students can critically think about their projects:

*“We were able to come up with new ideas, criticise 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.”* (Graphical design student, Ireland).

### Self-knowledge and self-awareness

High self-awareness leads to better team performance; it affects positively to decision-making, coordination and conflict management (Dierdorff and Rubin 2015). The LAB Studio Model-learning is based on reflection and reflection is described as a process of self-analysis, self-evaluation, self-dialogue and self-observation (c.f. Yip 2006). The starting point of the learning process is for every student to identify his / her own needs and goals for learning. This helps students to define what and how they want to achieve their goals as a person and as a team member. Personal development in Oamk LABs is viewed from a team working point of view, thus goals are discussed, defined and reflected with other team members, LAB Masters and tutors. During the course of the LAB, the learning goals are aligned with the project goals.

*Personal evaluation discussions* are individual meetings with students. Before the meeting the student prepares 2-4 personal development needs from the point of view of their future expertise. Discussions are done with the same person(s) throughout the semester: at the beginning, in midway and at the end of the semester. In spring 2016, one student told about how displeased he was about the quality of his work, his unorganized way of using time and not being productive enough. The student set himself appropriate goals in cooperation with LAB Masters. As part of his self-evaluation, at the end of the semester, he writes:

*“I feel I am now much more capable at determining my strengths and weaknesses and I am also much more aware at what my current skill levels will allow me to do. I have realised that rather than doing everyone’s job, I have to have more trust in my team and have one job that is done to its best standard.”* (Graphical design student, Ireland).

During the process of studying in Oamk LABs, goals as well as methods to achieve the goals, are discussed several times both individually and in teams, because goals become more clear and will need adjusting during the study process. Depending on a student’s own wishes this can be more individual, but most students are open and willing to share their personal development areas at least with their team, some of them also with the larger learning community. This enables possibilities to have feedback and support from peers as well.

Development of self-knowledge and self-awareness happens both in planned activities as well as in serendipitous encounters which the LAB learning enables. The goal is to become a more self-directed learner. As a result, learning is dependent on the interests, experiences and actions of each learner and the circumstances in which learners find themselves. The fact that students and staff members are working together in close contact for at least one semester opens the possibility for a trusting relationship to develop. Cooperation with LAB Masters and coaches is partly planned beforehand, but students also know that whenever they need to have coaching, they can ask for it. Acting according to these principles reflects in action one side of the key values of LAB Studio Model, Trust and Care.

## Practices

As an operational model, Oamk LABs work more as a small company than as a school and according to our values the coaches treat the project teams like startup companies. We allow them to self-organize, divide the tasks and make their development plans. However, to support a climate of critical consciousness, feedback in LABs is given to individuals and to project teams and coaching groups during formal and informal sessions. In this way, giving and receiving feedback is a regular part of LAB studio daily activities. Learning at Oamk LABs mostly happens in relation to the team and the project.

Oamk LABs employ several practices to achieve both the learning goals and to bridge the academic work with the work-life. Some practices happen regularly over the course of a semester while others are one-time events. Figure 2 maps some of these practices with regard to two aspects. The vertical axis represents whether the activity is more team or individual focused and the horizontal axis tracks if the reasoning for the activity is more related to academic work or the work-life. We feel it is important to have a mix of practices for bridging academic training and the work-life while allowing learning to happen both as individuals and as team or group members. Academic methods aim for reflection of one's values, attitudes and actions, while practices with a team dimension are more closely related to work-life skills and advancing the project goals. These practices teach students to recognize the joys and challenges of teamwork and to value the contributions of team members. This helps to build a future professional with T-shaped skills.

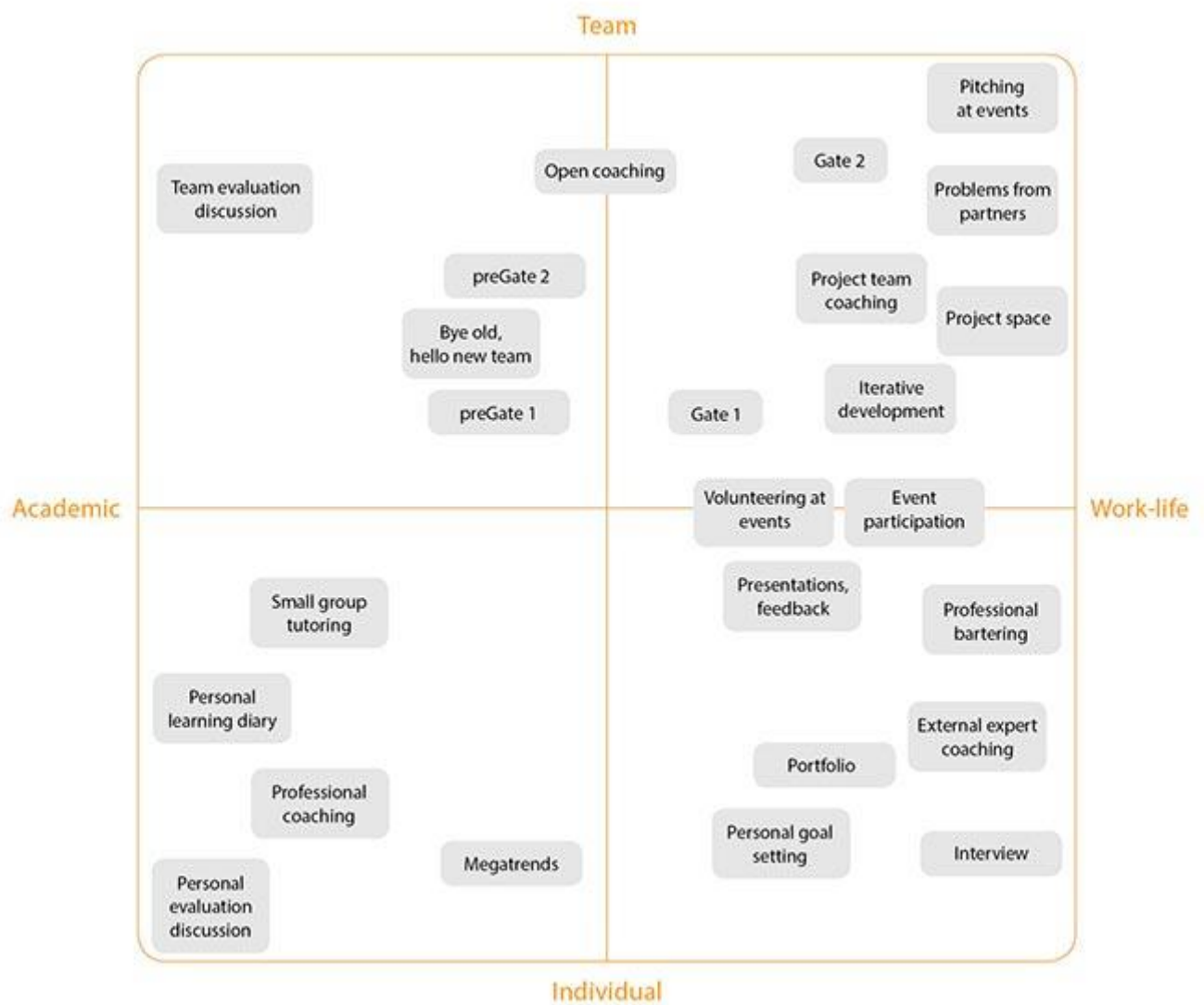


Figure 2: Some practices at Oamk LABs mapped according to the target of the activity and relevance in academic versus work-life needs.

The learning model is built to be flexible so it can accommodate different industries and types of projects, which may require adaptation and addition of new practices. Since the educational model is still under development, new practices are tried out in a limited scope and existing ones are

improved where a need is seen. The following sections cover three practices which specifically deal with bringing the work-life into the studies in more detail.

### Practice: Source of project topics

In order to bring the work-life in to Oamk LABs, the student projects start from problems or phenomena related to real cases in the industry. *Problems from partners* come with a contact person in the industry, but importantly projects are not assignments, where the company or organization might already have an idea of the solution they think they need or have a list of requirements at the ready. It is critical for project-based learning that the outcomes of the project are not predetermined (Blumenfeld et al. 1991). The coaches prepare the problems together with the industry professionals and to make sure that the project enables deepening of student's disciplinary knowledge. Another key aspect for suitable problems is that they require an interdisciplinary team. This leads us often to either look for novel business opportunities or to wicked problems, in which no one can solve the problem alone. Understanding the problem behind the problem, the need of the client, and the development process to build a viable solution all require different types of expertise (Saavedra and Opfer 2012). A student team owns the rights to their solution after the LAB and have the ability and receives support to create a business based on the idea if they so wish, which can be highly engaging for entrepreneurially minded students.

With respect to the interests of the participating companies, this practice strikes a balance by both bringing partners to the LABs and allowing the solution to take shape rather freely. The value for a company in participating is the ability to influence the studies, look for new talent or new business opportunities. In cooperation with the student team, the partners can act as guides in the industry, as sources of information and provide access for user testing with end users. Companies who recognise the problem are also potentially the first customers for the solution and can provide valuable feedback for the student team. Partners who work closely with LABs get a chance to see the talent in the students and by offering problems also affect the content of the instruction in the LAB.

This practice naturally puts requirements to the coaches to be responsive to student needs during the LAB and also before the LAB starts in order to look for the problems in their networks. The IP rights agreement, the open doors policy and public nature of pitching sessions mean that some projects are not suitable for LABs. Overall, this practice is a benefit and an important cornerstone of running Oamk LABs since it enables new business opportunities, which may have initial demand in the market.

### Practice: Project proposal presentations and selection, Gate 2

*The Gate 2* event and pitch presentations are held at the end of the concept creation, LEAD-phase. The event is public and open to everyone. This is a key practice in bringing the competitiveness to the LAB and builds on the industry connection by having a panel of professionals in the jury, often from companies, industry associations and public organizations. A jury of outsiders is needed so we can get an unbiased view on projects, because at this point LAB Masters and coaches have been working with the teams for weeks and benefit from outside perspectives on the projects. Having new people listening to the presentations also raises the stakes and puts more emphasis on the delivery of the message. Coaches who know the story might fill in the gaps based on previous

knowledge whereas fresh eyes and ears spot the inconsistencies. Judging is based on the framing of the problem and context, the business opportunity, viability of the solution and demo plan and the strength of the prototype.

Based on the jury's feedback, projects are chosen for the LAB phase and the demo development. New team members join teams to create the final project teams. Gate 2 is a stressful event for most students, but creates a strong boost with an important deadline; do a good job or your project is dropped. The Gate 2 presentation should summarize all learning from several weeks of research, development and debate into one presentation. The team members need to work together to pick the right story to tell, find an interesting and compelling way to tell it, select the right person to present and support that person in preparing. This is not always easy and coaches need to facilitate this process in coaching sessions and by running a *pre-Gate* with presentations and feedback from coaches and peers.



Picture 2: Gate 2

event Spring 2016 was held on campus with high production to show students that their work is valuable and also to show the work to other students.

The downside with Gate 2 is the potential loss of motivation if one's' project does not pass the gate. The jury and coaching feedback needs to be honest and open to offer a chance for reflection. We view this as an important learning moment as well. The project team might have done everything in their power and still get cut due to factors outside of their control. For example, the LAB can only support a certain number of project teams and thus some are cancelled. Similarly, companies have limited resources and some development projects have to be cut despite the great work and promise they may hold. Gates are connected to a practice called *Bye old, hello new team* in which we reflect on the Gate and show that there is value and things to learn from the projects that did not continue.

Practice: Events as learning opportunities

Event participation can take many forms and provides opportunities both to connect to work-life and to build competences. Students can participate in industry events, like seminars or networking events as a part of the public. Non-formal connections with work-life are emphasised by also organising common events or seminars. All event participation promotes social interaction, networking, non-formal peer-coaching, critique and constructive feedback. Students can also take part in organizing events or volunteering at large events. Some student teams with very promising products can even pitch at startup events already during their studies in LAB. This brings the

student team under the same level of scrutiny as the already established companies pitching for the same judges. For example, at the Midnight Pitchfest (2016) in Oulu, Finland one of our student teams was in the top 5 in the general category among over 20 companies. Pitch opportunities create extra goals to boost motivation among students.

Volunteering at events creates opportunities for networking and builds appreciation of the industry. In the spring of 2016, the LAB Master of DevLAB decided to send all of the students to volunteer at a startup pitching event titled Polar Bear Pitching (2016) in Oulu. They helped to build up and tear down the stage area, served food and drinks, drove people and gear from place to place. Through this experience, students reported to have gained more understanding and respect for the various skills and the hard work needed to put on a successful event. They highlighted the need for communication and collaboration during the event and the need for organization and planning. While the time spent at events naturally takes away from advancing the student projects, LAB Masters need to ensure that goals are reached.

## Practical considerations for running LABs

### Maintaining bridging and alignment

Oamk LABs curricula and cooperation methods are developed together with the recognised stakeholders in LAB focus industries. For guiding the practical development work, Oamk LABs has established two steering groups (SG), one external and one internal. The internal SG is for the development of interdisciplinary and interfaculty practices and curricula within the university. The external SG is for adjusting the model to address industry needs better as well as helping to find suitable problems from the industry. This arrangement of SGs prepares the model to be closely aligned with the needs of the industries and with Oamk internal practices and structures.

### Environment for Studios

The premises and location of a studio have an important role in studio model education, and thus require special attention. Based on our experience and according studio model research (Bull et al. 2013, Lee et al. 2015), the environment represents and promotes different ways of learning. The ownership of the premises enhances a feeling of trust and safety among the participants, and helps build the working culture. In addition, the visual representations of the projects are important for professional awareness (Bull et al. 2013) and reflective practice (Schön 1983).

With this in mind, Oamk LABs operates in three different locations; two in the downtown area, one on the university campus. Students, who all have 24 hours a day / 7 days a week access to the space, generate common rules for the premises. Premises include a kitchen area with a chill-out lounge, common spaces for lectures, working spaces for project teams and meeting rooms. Student teams are allowed and encouraged to modify their own space according to their needs. This action has the goal of enhancing the students feeling of control and ownership of the space to allow them to channel their motivation and follow their passion in creating their future. In addition, LABs premises are surrounded by supportive structures for creating new businesses. Usually new startup companies established from the LABs, LAB alumni, stay in close contact with the LABs. These



relationships are benefitting from each other as LAB-newbies and alumni can support each other's learning and product development.

Oulu Game Campus is a practical example of the industry's interest to collaborate with the Oamk LABs and its ability to respond with the education bridging work-life. During the year 2016, Oulu Game LAB together with Fingersoft and other game companies in Oulu established a game industry pre-incubator initiative and facility in the Oulu City Centre (Kaleva 2016). This new campus brings together students, coaches, startups and more advanced companies, as well as companies giving supportive services for the industry, such as legal, accounting and financing services.

## Renewing the role of the teacher

Studio based pedagogy drives renewal of teaching in vocational higher education. The LAB studio model sets new and challenging demands for the role of a teacher as educator, since the traditional teacher-student setup is turned upside down. With inspired, talented, well-connected, interdisciplinary and experienced personnel the learning is enhanced by using multiple methods inside the studio (Oamk LABs 2016). Teachers become more like coaches and consultants advising for the student teams in their projects, guiding learning, stimulating peer-learning and facilitating connections to work-life. Coaching is a new way of teaching and poses challenges to teachers, but is also something unfamiliar to students as well as demonstrated by one student:

*"... I totally support this equality between teacher and student cause 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 question to push ourselves through our individual way. This was frustrating, interesting, annoying, challenging, helpful and very efficient"* (Perka 2016).

Because of being full time studies, Oamk LABs give coaches the opportunity to act as a mirror reflecting the professional development of the student by giving constant feedback. Based on program experiences and trials, the suitable size of a LAB student group has been defined as between 30 to 40 students. In our experience the minimum amount of students ensures the forming of a multidimensional LAB community, thus enabling the learning community. On the other hand, the student group should be small enough to create a comfortable environment where students are familiar with each other. The studio education period should also be long enough to provide sufficient time for building a trustful relationship between coaches and students.

Since LABs curricula is designed to be flexible based on the needs of work-life and focuses around the needs of the student project, individual teachers' traditional lesson plans cannot be utilized. Instead, teaching is principally based on the emergent needs of a student team project, referred to as impromptu teaching. Interdisciplinary teams and different student backgrounds force teachers to be open to new ideas and agile in guiding students. These Oamk LABs working methods challenge teachers to support 21st Century Skills and tap into their T-shaped skills. To succeed, teachers are well connected and have the latest knowledge from their field of expertise.

At Oamk LABs, staff form and operate in an interdisciplinary team of LAB coaches. The teacher's ability to utilise the team of LAB coaches for needed expertise and introduce new external experts is necessary to advise student projects successfully. The working method also clashes with the traditional way of resourcing and planning teachers work time, since teachers are working as part

time and have also other responsibilities outside of LABs. The needed coach might not be available for an impromptu session when it is needed. LAB Masters are responsible for resourcing and must anticipate the needs in projects. Over time the same issues emerge at the same phases of the projects and therefore resourcing can be matched more closely.

Training the LAB coaches for the model is essential to the successful delivery of a studio type of education (Schön 1983; Bull and Whittle 2014). The Oamk LABs staff has been educated for the LSM through a specific training program which includes intensive, practical and theoretical coverage of learning practices in the model. In fact, commonly at the beginning of the training program, coaches experience the concept development components of the LAB as a student. By experiencing the model first, coaches are able to better align their own teaching later on to the needs of a student team and individual students. Overall, teachers in studios need to be living according the values and act as future professional role models. Interestingly, the majority of the teachers participating in LABs have entrepreneurial or private sector background, which provides them with a strong understanding about business.

## Discussion and future developments

So far studio based education has been utilised mainly in creative disciplines, such as architecture, design and arts for bridging academic and work-life practices. However, the nature of problems that future professionals are facing demands developing skills such as creativity and collaboration, – 21st Century Skills. This suggests why interest towards studio based pedagogy has increased in recent years among other areas of professional education (Heikkinen et. al. 2016). The studio based environment encourages the learning of work life skills in a climate that tolerates failure, which is essential before moving into work life. Project and problem based learning with methods using reflection are also widely used in studios. While current studio education typically includes students from only one discipline, the experience from the Oamk LABs studio environment calls for including students and teachers from different areas of expertise.

Based on experience from Oamk LABs, studio pedagogy can be highly demanding for students and teachers. The environment at LABs may be confusing for students because of the working methods and the interdisciplinary, international and intergenerational group of students. Communication between the different professions in a language that might not be your native language is challenging. Often extra effort is needed to make yourself and your ideas understood. Many of the students are undertaking concept development for the first time in their life and LABs offer a safe environment to make their first real designs for real problems provided by real customers. More advanced students provide an opportunity for Master-Apprentice-type learning since they can act as role models for younger students. After the ‘cultural shock’ at the beginning of the program, students recover and start to perform in a company-like environment as young professionals and eventually gain new knowledge for the task at hand.

The Oamk LABs future development continues through trials and evidence based development of methods. When the LSM is applied to other industries and countries and more degree programs are involved, the growth sets increasing challenges for the model definition, and external and internal communications as well. The Oamk LABs were created and continue to be developed through agile methods to be a dynamic education program with substantial freedom of operation to address changing needs of the industries and society at large. Creating interdisciplinary programs in higher

education requires courage and a willingness for cooperation from within the different degree programs and a common recognized need, which can be formed only through co-creation and discussion. External pull for new types of expertise or a crisis can jumpstart the development of these new forms teaching and learning.

Oamk LABs enables learning of 21st Century Skills in higher education by educating self-directed learners who are active and concerned citizens. They are persons with an opportunity mindset and the confidence and tools for co-creation of innovations. The LAB studio model includes several additional components compared to many of the existing models of studio based learning. Since it is designed to be international, interdisciplinary, intergenerational and industry focused, it brings new opportunities for learning 21th Century Skills. In our opinion, bridging work-life and higher education happens through the renewal of teaching and teachers should act as role models for the new skills required. Oamk LABs is a dynamic and open environment which offers a platform to renew teaching practices and invites all participants to learn and develop together.

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