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EXPERIENCES ON A MULTIDISCIPLINARY CDIO PROJECT

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ABSTRACT

Laurea, Haaga-Helia, and Metropolia Universities of Applied Sciences organized their first joint Professional Summer School Sprint on a multidisciplinary topic on wellbeing technology on summer 2016. The main idea was to gather multidisciplinary groups of students from each institute and their partner institutes for a two-week long service innovation seeking intensive course, provide them with real business problems from partner companies to solve, and to provide the students with modern tools and methods for co-creation and service design. This paper gives a brief introduction to how co-creation and service design were used as a learning environment, describes the results from the PSS Sprint 2016, and discusses about future development of the concept.

KEYWORDS

Wellbeing Technology, Project-Based Learning, Service Design, Co-Creation.
Standards: 3, 5, 6, 7, 8, 9, 10

INTRODUCTION

Laurea, Haaga-Helia, and Metropolia Universities of Applied Sciences organized their first joint Professional Summer School (PSS) with a title "Digital Wellbeing Co-creation and Start-up Summer School 2016" on Leppävaara campus on April 30 -- June 10, 2016. The main idea was to gather multidisciplinary groups of students from each institute and their partner institutes for a two-week long service innovation seeking intensive course, provide them with real business Design-Implement (CDIO Standard 5) problems from partner companies to solve, and to provide the students with modern tools and methods for co-creation and service design.

This event was initiated by the presidents of the universities as a part of enhancing co-operation between these three universities of applied sciences operating on the Helsinki metropolitan area in southern Finland. The institutions have begun developing measures to

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promote student mobility and entrepreneurship education and help create easy-access programmes for innovation between higher education institutions and SMEs in the Helsinki metropolitan area.

In addition, there are collaboration efforts aimed at leveraging global funding channels for research and other projects more efficiently than before and creating Finland's largest cluster for education exports in the UAS sector. The Professional Summer School is one of the seven development projects under way.

The partnership draws from each institution's unique educational profile and identity. The Helsinki metropolitan area needs higher education institutions with distinctive profiles that respond to the region's skills needs, both on bachelor's and master's degree level. To this end, the institutions are focusing on a strategic partnership that will benefit both students and employers. The joint efforts also serve as an excellent platform for building staff competence and faculty teaching competence (CDIO Standards 9 & 10).

This paper gives a brief introduction to how co-creation, service design, and open innovation were used as a learning environment, describes the results from the PSS 2016, and discusses about future development of the concept.

BACKGROUND

The idea of the Professional Summer School Sprint was based on Integrated Learning (CDIO Standard 7), open innovation, Living labs (<http://openlivinglabs.eu/>), and user centred design.

Open Innovation and the Living Lab operating model's development are linked with the development of the post-industrial society, and they both emphasize on Active Learning (CDIO Standard 8). The Living Lab model was initially developed to understand people's everyday objectives, needs and challenges and solve problems in their actual living and working environment. The starting points of new products, services and service processes are then the customer and market needs and the production of added value accordingly. The value experienced by the customer is an important criterion in assessing the usefulness of each innovation. The innovations created may be incremental or radical.

The Living Lab concept generally refers to a systemic, cyclic innovation, where all co-creation actors take part in the development and piloting of products, services, applications, technologies or new business models and policy programs. The parties responsible for product and service development usually take the development work through the following stages: background definition, brainstorming, and conceptualization, applying the concept in practice, creating prototypes, testing and further development, business model development and piloting, product launch and subsequent updating and further development. The role of end-users varies at different stages of the innovation activities and according to the purpose at each time (the innovation may be developed for, with or by the end-user). The results of the activities should correspond to the needs, goals and values of the customers/citizens/end-users.

With funding from the EU1 and nation states, Living Lab activities have developed into a widespread approach where international cooperation between end-users, research

institutes, cities and companies may also solve complex societal challenges, develop and pilot new business models and policy programs as well as create new jobs. In 2016 the Living Labs received the Innovation Luminary Award for best open innovation platform development. The quickly progressing effects of digitalization on health and wellbeing is simultaneously both a challenging change and a global business opportunity that can be reacted to by means of internationally scalable co-operation, also creating jobs. The Living Lab may also be a physical or virtual innovation platform or meeting place, such as the Professional Summer School Sprint or one of the technology platforms or digital applications used by different stakeholders, if the purpose is to enable multi-party co-creation and innovation.

The solutions created as results of the activities may be new or improved products, services and technologies or new, integrated or systemic solutions created using combinations of these. The resulting solutions may also consist of mutually supplementary social innovations, new operating concepts, business models or policy programs, if these are considered to produce added value for end-users. It can be said that, at their best, Living Labs strive for human-centric added value and innovations that are created by interaction between various actors in the ecosystem and mutually supplementary solutions and result in new markets and jobs. The assessment criteria for the concepts and solutions created as results of development challenges, development proposals, prototypes and activities depend on what new services or other solutions were pursued and how they can be developed in mutual co-operation.

Throughout Integrated Learning, open innovation, Living labs, and user centred design, the role of HEI and educational programs are evolving parallel to industrial and societal development. In this sense, the PSS Sprint operates as an important and valuable experimentation platform.

CONCEPT

The paradigm shift in marketing has highlighted the role of customer. Having been faceless objects, customers have become active subjects in the recent years, and customer orientation has become an essential topic in business operations (Kokko & Mäki 2009). The main issue in customer orientation seems to be the understanding that companies should focus on customer-perceived quality and solutions that better satisfy customer needs and expectations. These developments have impact also to educational sector.

From strategy and product development point of view, the summer school concept followed Blank's (2012) and Kosonen & Doz (2007) line of thinking. Blank (2012) emphasize strongly customer involvement to strategy formulation and business creation activities in general. In Blank's four step strategy formulation process, three first steps relate to capturing customer insight and only the last phase focused to business strategy process and strategy formulation. Kosonen & Doz (2007) underline the general agility of the company and the capability to transfer resources flexibly from less promising markets to areas with new possibilities. In general, companies overall ability to adapt change is one critical success factor (Vrontis et al., 2012; Mäki & Alamäki, 2014). The development, innovation and study processes at Sprint had a strong customer focus as a driving force to all actions. The participating case companies worked closely with the students and the Sprint concepts

highlighted the interaction and data gathering from end-customers.

From the beginning, the idea for the course was to create an innovative new service concepts for the field of healthcare. Building upon earlier experiments, in particular Laurea Game Jam 2015, Laurea's experiments in using Global Service Jam as a learning environment, and Metropolia's strong background on CDIO based Intensive Projects, a decision was made to use a Design-process based approach to tackle problems introduced by real companies.

Design process is generally speaking an approach to problem-solving, framed in a nonlinear sequence of activities that utilizes creative thinking in problem solving (Tschimmel 2014, 5). Design process can be framed in a number of ways (e.g. Liedtka & Ogilvie 2011; Curedale 2013; Ambrose & Harris 2010; Brown 2009; Tschimmel 2012). The two-week session was framed to follow a future-oriented Service Innovation process model introduced by Ojasalo et al. (2015).

The selected process model was considered to be executable in a short time frame of two weeks long Design Implement Experience (CDIO Standard 5). While the process model is by nature an iterative instead of being linear, it was considered to be structured in a simple enough fashion to be split into a firm schedule that would be self-explanatory for the students to follow, regardless of their earlier experience of conducting such process. In addition, the authors of the process model give clear guidelines for the types of tools and methods applicable for each stage of the process (Ojasalo et al., 2015).

In Practice

The students were divided into small groups of 4 to 6 students and presented with a case assignment. Each group consisted of students from various disciplines to ensure cross-pollination of different viewpoints and different types of ideas. The participants' educational backgrounds were numerous featuring students from curriculums in business management, social services and healthcare, business IT, facility management, electrical engineering, hospitality management, and business marketing to mention a few. Each morning the students were given guidelines as to what they should be focusing on next, as well as an introduction to the recommended tools and methods they might find useful. Mentoring was available for the students at all times, but the responsibility for planning and taking action to complete the project was on the students themselves. For the first week that focused on collecting insights of the users and understanding the problem space related to the assignment, the mentoring was taken care of by postgraduate students of Laurea UAS. During the second week which was more focused on developing a prototype of the final offering, the mentoring was mainly managed by teaching staff. The number of mentors per group varied. Due to practical reasons, some of the mentors stayed with the group from get go to the very end, while other groups only had mentoring available in the same room and on request, and not constantly focusing on their group. On a general level, one mentor was capable of managing three groups simultaneously, also highlighting the demand for the groups to do their work independently.

The emphasis of Professional Summer School Sprint was on learning through the case project. Lectures were kept short, and the lecturer and quests that gave speeches during the case project were instructed to keep their sessions shorter than one hour. The opening

Monday was the only day that focused on lectures and instructions. After the teams received their assignments on Tuesday, the number of lectures was kept to a minimum to provide the students the opportunity to stay focused on their assignments. The lectures' content was determined by the stage of the process, and the of each lecture was to give the students tools and new understanding that would be applicable in their case project. In early stages of the process the lectures focused on Service Design, user research methodology, methods of strategic foresight, ideation and prototyping methods. In the latter part the focus was more on framing the concept and marketing. Early on during the first week one of the lectures also focused on how to create an impactful pitch for a new service concept. In terms of the schedule, this particular lecture would have been more fitting for the second week, but as this particular lecture was also intended to raise the students' spirit, it was scheduled for the first week.

During the first week, the students focused on learning more about their case assignment. They worked on field- and desktop research to learn about the end-users, the service providers business and the business environment, and the current and future trends in the field of their assignments. The first week concluded in students generating ideas of what kind of offering they might be prototyping during the second week. The second week focused on prototyping and business model generation, and finally pitching their newly created concept to the clients, the teaching staff, and other students.

The assignments were actual business- or customer problems that were introduced by both Finnish and international companies and public sector organizations. The assignments focused on a variation of topics related to digital health and wellbeing. The original plan for the assignments was to frame a problem without an obvious solution. Assessing by the outcomes of the assignments, assignments that filled this criteria were also the most suitable to be tackled using the selected process model intended for creative problem solving. The assignments featured tasks such as developing new digital solutions to ease the lives of cancer patients and their relatives, to develop a concept for a mobile eye hospital for developing countries, developing new digital offerings for a yoga studio, creating new time reservation concept for a communal public healthcare operator, and so on. Initially the plan was to allow the students to work on their own startup ventures as well, but this option was later limited to one group as a result of many of the registered students cancelling their participation and the demand to even the number of students in each group.

INTERVIEW RESULTS

Interview were conducted to get overall feelings and topics hidden under the surface. Student groups were interviewed on the middle of the second week. Since the answers started to repeat themselves and the groups were busy practicing their pitches, all of the groups were not interviewed.

“Tough but great”

First, the groups were asked simply to tell their current feelings of the course. One student's answer summarizes it all: *“tough but great”*. Everyone was saying that they have been learning a lot of new things, worked harder than what they expected, and have had a great experience.

Laurea students were already familiar with the service design methodology, but they found new aspects when they applied it in multidisciplinary group works. One Laurea student said that *“This has been the best implementation of service design project she had ever been on”*. All students agreed that the methodology they practiced during the course, would be very effective tool also in other cases whether they are related to healthcare, business, technology, or any other discipline.

Students liked the change in teaching methods and pedagogy, and also were aware of the challenges when trying to balance control and given freedom on this kind of implementations. Some students would have liked to have more lectures and background, while the others would have preferred more group working. Some groups were happy about the amount of instruction and some felt it sometimes interruptive for the group work.

Students also mentioned that they gained new friends, holistic thinking, and improved their intercultural communication skills. Everyone liked the open, relaxed working environment. Some inspirational speakers, motivational mentors, and enthusiastic teachers got a high appraisal from students.

“I found a reason for making mind maps”

Second questions was about what students learned or achieved during this course. After working on a real life customer challenge on multidisciplinary group one student said: “This far I have been making these mind maps on courses because the teacher asked to do so. Working on this case I have found that it really is a valuable tool to get things done properly”.

Most of the students had their first experiences in working on a multidisciplinary and multicultural groups and thought that this would help them to face the future. Several teams also mentioned that they learned good tools for making innovations, which can be applied broadly in their future profession. One student joked that: *“I used to hate the word Innovation, but now I’m converted”*.

Some teams also mentioned gaining awareness of working between different cultures. Political correctness does not necessarily lead to good results, and therefore sometimes it would be acceptable to bend the rules.

Some groups pointed out that when they started to work on their case, they quite soon noticed that nobody had required expertise. However, they started working hard and were surprised to find that together they found feasible solutions to the current problem.

Some students felt they had learned a bit of entrepreneurial mind set. Some of them got curious to find out more by joining the Entrepreneur Society of their home institute. Presentation skills and fast prototyping were also mentioned. The interviews strongly indicate that the students’ personal and interpersonal skills, and product, process, and system building skills improved (CDIO Standard 7) during this Service Design based multidisciplinary Design-Implement Experiment.

“Commitment”

Third questions was about what should be changed, if anything, for the next time. All groups

mentioned first the word Commitment. Few students disappeared at the middle and caused some challenges for the rest of the team. Fortunately the groups were big enough that missing one student did not cause much of a trouble for the rest of the group. Students suggested to have some control over the participation.

Some groups expected more supervision and appearance from the customer side in order to find out better their needs and desires. One group had only one phone conversation with the customer during the whole course. Students suggested that the customer companies should be trained more for the course to have more realistic expectations what can be done in two weeks. They also suggested that the company should send one of their employees to participate the course full time.

Sometimes when three groups were working on the same room, the noise level grew too high for some students to concentrate. This small problem was solved easily by moving into another space. Freedom on allocating their own space was highly appreciated.

Facilities worked rather well except that there were unexpected problems with wireless internet connection. Also they did not find enough of information about WLAN, printing, and some other practicalities. They suggested that next time would be a Q&A sheet summarizing the most common practical questions.

“Don’t change anything”

The last question was what should be the topic next time. Most common first reaction was “Don’t change a thing, this works really well”. Students wished that the multidisciplinary nature of the course would be kept. Also health-related topics with a twist to business and technology were also valued.

Some hot topics were mentioned: robotics, logistics, innovations, sustainability (several times), environment, IoT, recycling, social security, urban city, immigration and integration, tourism, medicine, social media and lifestyle, user experience, education, and future. However, they also said that the course name is currently very, very long.

“Thank you very much”

Interviewing the groups was an empowering experience. Students looked tired, but they still were smiling and in an excellent working flow. Most groups were thankful for getting an opportunity to attend this course.

Front-line managerial experiences

The ability to manage ambiguity turned out to be vital for Summer School Sprint management team. As a pilot experiment the team was unable to rely on earlier experiences and foreseeing what would and what would not work was difficult. The original plans were under daily adjustments and problems were solved as they occurred. Resilience to changes is afterwards seen as a fundamental characteristic to the front-line managers of such courses. Having a strong understanding of the Design-Implement process and ability to adapt to the situation and apply new methods when original plans were not producing desired results were necessary in order to cope with the ever-changing situation.

CONCLUSIONS

Laurea, Haaga-Helia, and Metropolia Universities of Applied Sciences organized their first joint Professional Summer School Sprint. The Sprint gave a true Design-Implement Experience for the students, and it improved their substance knowhow simultaneously with their personal, interpersonal, project, process, and system building skills.

Involving real companies to Active Learning experiences such as Professional Summer School Sprint improves the motivation of students, but it brings also challenges. For the next Professional Summer School, we will try to improve the commitment of the companies by focusing on a fewer number and improve our communication with the companies.

Student groups also suffered from no-shows and drop-outs. We will take some measures to give prospective students a better view on the course requirements, such that they would know how intensive course is and what is the depth of required commitment.

At the writing of this paper, the next Professional Summer School Sprint 2017 was under development. The last year's experiences and especially student feedback will be used to improve the impact of the event. We also invite our colleagues worldwide to give suggestions, advice, and share experiences on similar activities.

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Päivi Haho, D.Sc.(Tech) is a Principal Lecturer at Metropolia University of Applied Sciences. Currently, she is focusing on RDI in health and human related technologies and robotics. She is interested in student and customer centered methods, and has developed several implements for coaching and teaching in previous years.

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