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Co-creation of innovation between higher education students and actors in public, private and the third sector

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Abstract:

The purpose of this paper is two-fold. Firstly, we shall introduce Care Innovations Arena (CIA), a novel trans-disciplinary open innovation learning environment. Secondly, we shall explore the application of the CIA in two different open-innovation projects and compare the outcomes. The focus will be on co-creative innovation production processes carried out in a cooperation between higher education and actors from public, private and the third sector. [anything of the outcomes...?]

Keywords: Collaborative learning, Higher education, Learning innovation, learning environments

1 Introduction and purpose

Continuous changes in working life call for a serious rethink on work practices and employability skills of the 21st-century provided by education systems. Zitter and Hoeve (2012) suggest overcoming of the challenges in the education-work -transitions by shifting the focus in education from individual learners to learning environments. The broader notion of learning environments facilitates these transitions by establishing horizontal connections between education and the workplace, across activities and subjects, in- and out-of-school (Dumont & Istance, 2010) . Engaging students in solving real-world problems or ill-defined professional tasks that are complex, realistic and challenging are important in invoking active learning processes (Könings et al., 2005; Baartman and De Bruijn, 2011).

The purpose of this paper is two-fold. Firstly, we shall present a novel trans-disciplinary open innovation learning environment, Care Innovations Arena (CIA). Secondly, we shall investigate the functionality of the CIA in real-life contexts by presenting and comparing of the outcomes from two open-innovation projects. The paper is structured into three main sections. The paper is structured into four sections. The first provides a theoretical point of departure for the presentation. The second section is a description of the CIA, followed by a presentation of the two open-innovation projects and their outcomes, as well as a comparison between these against the CIA. The final section is a critical discussion on the CIA and its usability and power to contribute to learning and skills needs in the 21st-century.

2 Theoretical background

The new realities in working life and the world of education challenge not only the contents of education but also the pedagogy (Chelliah & Clarke, 2011): traditional forms of teaching and learning need to evolve to address skills required in achieving working life competencies (O'Hara, 2007). Engaging the digital generation of students in learning processes that emphasize creation of skills that match with twenty-first-century learning skills (problem solving, self-regulated learning, collaboration, sharing ideas, focus on learning etc.) and employability skills (communication, collaboration, creativity, leadership and technology proficiency, etc.) is becoming the new imperative. The ability to collaborate in diverse teams (face-to-face or virtual) to accomplish tasks, to create, share and master knowledge through quasi-accurate information,

are necessary skills in today's working life (Dede, 2000, 282). Chelliah and Clarke (2011) suggest that Web 2.0 technologies have the potential to trigger learning innovation and enhance teaching and learning. However, as they emphasize, technologies are and remain tools and cannot by themselves generate innovation, nor realize many educators' vision for technology to improve education. Consequently, there is a need to develop approaches in education, which address their mission, curriculum content, pedagogy and modes of enquiry, so that a ''shift in the deep structures of consciousness'' towards the ''development of trans-disciplinary expertise'' can be achieved (O'Hara, 2007, 930). The latter calls for new literacies and approaches to learning, which according to O'Hara (2007) are more attuned to the socio-cultural, psychological and spiritual needs of an emerging global knowledge society.

The report *New Nature of Innovation* (Rosted, 2009) emphasized the need for companies to open up their innovation processes and learn to listen to the customers and address their needs on their terms. ICT will be a key enabler when co-creating unique value with individual customers. Tapping hidden knowledge from the customers and involving the users in the beginning of innovation processes, calls for new knowledge and competencies. In this line of thinking companies will form collaborative networks and engage themselves in binding innovation partnerships. Moreover, the seamless and successful collaboration between higher education and private and public sector (Triple Helix) has been recognized as one of the key driving forces in innovation-driven economies (Etzkowitz and Laydesdorff, 1999; 2000). Thus, there is a need to foster the role of higher education institutions as engines of innovation in collaboration environments (Domik and Fischer, 2010; 2011; Thorp & Goldstein, 2010). An interdisciplinary approach to teaching entrepreneurship can bring something new, fruitful and innovative to our standard teaching approaches (Klapper & Tegtmeier, 2010, 564). From within the school of open innovation it has been suggested that the business success will depend more and more on the ability to utilize external resources via open innovation processes (e.g. Chesbrough, 2003). Innovativeness, improvement and developmental orientation are regarded as success factors in organisations (Zinck et al. 2008).
The European Commission's Strategic Innovation Agenda of EIT (2011) proposes that the future of Europe rests on growth, which is smart, sustainable and inclusive. To this end the 'knowledge triangle' of research, education and innovation and the interaction between these three, is seen as key driving force.

3 Care Innovation Arena (CIA)

3.1 The purpose and concept of the CIA

CIA was organised as a pilot event, implemented in November 2012 and January – April 2013. The purpose with the pilot was to improve and strengthen innovation knowledge and capabilities among wellbeing actors in the region of Hameenlinna in south-Finland. These actors were the HAMK University of Applied Sciences, Laurea University of Applied Sciences and Lahti University of Applied Sciences (teachers and students participated), and representatives from working life in public and private sector. In other words, the concept of the CIA is an application of the Triple Helix framework.

3.2 The structure of the CIA

The CIA structure and collaboration processes constitute of keynote presentations from a main stage, and poster stands and an innovation mill workshop area, divided thematically. The series of short keynote presentations, utilizing one-to-many communication approach (Hoffman and Novak, 1996). Each presentation is followed by brief session for the speaker to meet face-to-face with participants who were interested to comment or ask questions. The follow-up represents a one-to-one marketing approach in which the speakers "offer" and the participants' individual needs meet (Pepper and Rodgers, 1996). An important element of the CIA-concept is also that after the complete series of lectures, the speakers will be available for informal discussion with the audience.

In the pilot, a total of eight fifteen-minute keynote presentations were given from the main stage during the event. After each presentation a fifteen-minute timeslot was reserved for the speaker for communication with the audience.

The area round the main stage and event hall was divided into four thematic sectors in order to support different kinds of innovation domains: 1) pedagogical innovations (Kirti, 2007), 2) socio-cultural innovations (e.g. Geels, 2004; Peck et al. 2009; Mutsikiwa and Basera 2012), 3) wellbeing-service innovations (den Hertog, 2010; Agarwal and Selen, 2011), and 4) wellbeing-technology innovations (Wang, 2005). The structure is presented in Figure 1. The communication and collaboration within these themes were arranged with the help of "passive" poster stands and "interactive" innovation mill workshop area (in Finnish *Innomylly*). The latter represented a kind of "one-to-small group" communication

model between the presenter(s) and the audience. The purpose of the innovation mill workshop areas was to engage the participants in intensive interaction and to experiment with interactive innovation tools. Our example cases ForeMassi2025 and Konseptori were included into innovation mill area.

A summary of the CIA is illustrated in Figure 1. The inner circles in the figure represent intensive interaction between the poster-presentations and audience, while allowing also for active one-to-one interaction. The outer circle represents a simultaneous, typically passive one-to-many mass communication model. The four different innovation themes were defined as sectors, to illustrate and emphasize that for each theme area it is important to offer activities in each circle.
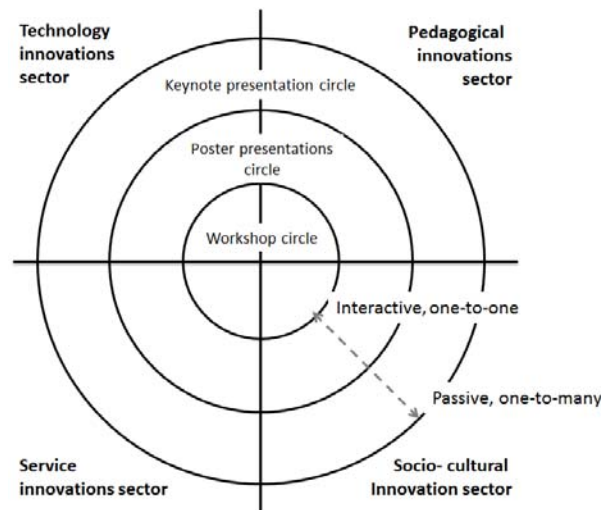
Figure 1 Structure of Care Innovation arena event.

4 A comparison of two open-innovation projects applying the CIA

The two open-innovation projects to be compared here are called ForeMassi2025 and Konseptori. The CIA concept was applied in both of these. By integrating these two projects as participants to CIA, we were able to evaluate the benefits and weakness of this trans-disciplinary open-innovation learning environment in real-life context. In this section we shall first present each of these and then compare the results of this from the point of view of CIA application.

4.1 Description of ForeMassi2025

ForeMassi2025 is a project forecasting the educational needs for wellbeing and security sectors via open innovation process. It also makes improvement suggestions to the Finnish National Board of Education. ForeMassi2025 focuses on a long-term foresight of qualitative skills in the wellbeing and security sector, concerning especially independent living throughout life. The detailed scope and results of the project are available in Meristö *et al.* (2012a, 2012b), Laitinen *et al.* (2013) Santonen *et al.* (2013).

On the basis of series of national and regional foresight workshops, four future scenarios had been defined. However, in the context of CIA only the following two were used: *Welfare and Security on Technology* and *On the Markets' Terms.* The former is a scenario, resting heavily on technology-driven, cost-effective solutions in an environment in which the private and the third sector act as a support to the public sector, and at the same time provides international growth opportunities for small and agile companies. In the latter, there is a versatile selection of private services in Finland, the use of which is supported by a national level system. Public services are available in the growth centres and are seen as an alternative for those with limited resources, not able to afford extra costs.

4.1.1 ForeMassi2025 objectives and data collection during the CIA

In the CIA the objective for the ForeMassi20125 was to find out what kind of novel professions the CIA-participants would define, relating to the two future scenarios described above. We were especially interested in finding out whether the profession suggestions were differing from the previously defined point of references produced in five regional workshops by a regionally diverse group of people (N=77) from different sectors.

During the CIA, two persons from ForeMassi2025 project group presented shortly the basic idea of the *Welfare and Security on Technology*

and *On the Markets' Terms* scenarios (two different stands). After the presentation, they invited the participants – arriving in average in groups of five persons – to suggest new professions on the basis of what they heard in the presentation. Due the nature of event and the working process, the exact number of participants in the stand activities was not tracked.

4.1.2 Results

It was estimated by the ForeMassi2025 presenters that the majority of the participants were students, but also a good amount of teachers were taking part to the activities on the stand. Out of all stand participants, about half of them wrote their own profession suggestion, which in our opinion could be considered as a satisfactory participation rate. Yet it was noted by presenters that they had to persuade part of the participants to contribute. As a result after combing the similar suggestions, the event participants generated all together about 30 different professions depending on how strict breakdown logic was used. The new professions suggestions were distributed nearly evenly between the two provided scenarios (i.e. 13 market driven and 17 technology driven professions). In Appendix 1 we have presented few examples of the participant generated professions. To sum up these examples it appears that in the market driven scenario, the services and the related professions which are bringing services to homes (or near) of elderly people were emphasized. In the case of technology scenario the professions which were related to guiding elderly people to use or understand the technology based services or in which wellbeing professional was using some novel technology as a tool to give service were mostly suggested.

When we compare these results to the previous ForeMassi2025 workshop results (e.g. Meristö *et al.*, 2012b; Laitinen *et al.,* 2013), genuinely new viewpoints were not identified to the already existing offering. Conversely it can be stated that the event participants heavily stressed by students, were able to generate similar viewpoint then a bit more diverse group of wellbeing industry and educational experts. The similar results observation was not a big surprise since 77 per cent of the previous ForeMassi2025 workshop participants had educational sector background either as a teacher, student or researcher. However, in our opinion the events such as Care Innovation arena and students as a target group can provide valid information for foresighting qualitative skills and new professions. Therefore our results are justifying especially the students as a legitimate Triple Helix actor, which should be used at least as a shadow group in development projects.

4.2 Description of Konseptori

Konseptori is joint project by the Innopark Programmes Oy and HAMK University of Applied Science. It is an open innovation environment that gathers both development ideas and innovators from the companies, developing organizations and private innovators. It is a multidisciplinary, communal and down-to-earth learning and innovation platform. Within the Konseptori-approach, real-life challenges in public institutions, among NGOs actors or in private companies, are solved in a multidisciplinary, creative and ambitious teamwork.

4.2.1 Konseptori objectives and data collection during the CIA

The main purpose of Konseptori is to increase regional innovation activity, support regional entrepreneurship and stimulate new business development. Konseptori is meant to open up innovation processes and be open towards the customers, address their needs, on their terms. Within it businesses and citizens can exchange their views and collaborate, in innovation partnerships between public institutions, private companies, NGOs and higher education. The Konseptori platform connects students with innovative projects given by real organizations. Being a learning and innovation environment, specific emphasis is given to create a safe environment for student teams with transdisciplinarity to innovate and develop problem-based projects. Students receive credits for the projects as well as project-based work experience and create the right network for their future working lives.

There were three wellbeing-focused assignments offered to the participants at the Konseptori: (i) to develop a future service- and care-centre, (ii) to develop a future public transportation system from a customer's point of view, and (iii) to develop music software for people with intellectual disabilities. The issues were represented as questions to help open up students interest towards them, f.ex What kind of new services does a future service- or daycare center offer for its users? The objective was two-fold: 1) to collect novel ideas and 2) to gain new and possible even naive perspectives in regards to the three assignments. During the CIA, the students attended in the Konseptori individually and in small groups. The themes have a real world impact, as they are all problems which haven't been solved yet. Many organizations have found new points of view with the help with the open sights and minds of students. In the context of the Care innovation arena, the focus was on creating a possibility to bring up new ideas solving the problems mentioned above. With the help of trained facilitators the small groups visiting the innovation corner were encouraged to use creativity in finding

solutions. The facilitators used different kind of facilitation methods to bring out the creativity and "naivity" of the students. The issues were drawn on papers, reconstructed with a modeling clay and downshifted to invent new aspects for solutive ideas. Beyond the concrete models, there was a simple structure of facilitation: using the main methods of service design. Personalization, value proposals and service paths helped the student teams to confront and develop the issues or, if they wanted, ideas that had been brought up by other teams.

4.2.2 Results

The CIA made it easy for students to come up with different kind of ideas. Every idea was written up and signed for further development. Not only an awarding system was motivating the students to turn in ideas, but also the principle of getting a chance to change things that actually matter and are real life issues. Every assignment got over 20 different ideas in the very few hours the happening took place in. After the arena the best ideas were picked up and went into further development processes within the Konseptori innovation model. This means, that the ideas given by students went into a new, deeper development process with student teams from different degree programmes

Again, as was seen with ForeMassi2025, students as a target group can provide plenty of fresh ideas. Therefore, our results are justifying especially the students as legitimate Triple Helix actors in innovation development projects.

5 Discussion: CIA, its usability and potential to contribute to learning and skills needs in the 21st-century

Traditional forms of teaching and learning in higher education have come to end and it's high time to realize changes of working life. New competencies of working life create huge demands to develop higher education pedagogy and learning environments further. The CIA with ForeMassi2025 and Konseptori platforms, introduced in this paper, are an attempt to meet these challenges of the 21st-century in higher education. These results are still preliminary. Nevertheless, they already provide some evidence of the usefulness of novel educational perspectives. CIA event itself supported various skills related to innovation capabilities.

In practice our case examples focused on the very early phase of the

innovation process (Cooper, 1988) typically know as the fuzzy front end (later FFE) of innovation (Smith and Reinertsen, 1991). The activities included in the FFE is still under discussion (e.g. Khurana and Rosenthal, 1998, Nobelius and Trygg, 2002, Jetter, 2003), yet most often including the stages from the idea generation to decisions on further development (Murphy and Kumer, 1997). Significantly, a great majority of whole life cycle costs and features are defined at the FFE stage (Wagner and Ehrenmann, 2010) although only minor costs are actually generated during FFE stage. This makes FFE particular interesting for educational sector which commonly has limited financial resources but might have great ideas. Therefore, we argue that in the future, events like CIA, could be important matchmaking platforms for different Triple Helix actors to foster innovations and utilize especially the innovation potential among higher education students.

We conclude that the events, such as the CIA, and students as a target/participant group can provide valid information for foresight, innovation and co-creation with working life. Therefore, our results are justifying especially the students as a legitimate Triple Helix actor, which should be used at least as a shadow group in development projects.

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Appendix 1: Examples of new profession on the basis of ForeMassi2025 stand

Market driven	Technology driven
Caregiver relief worker, similar to a farm relief worker but in context of family caregivers	*Wellbeing robot user/controller (or developer)* who is controlling (or developing) robots which are used for helping the elderly people.
Service guide who is helping elderly people to find the right services	*Technology guide* for elderly people who gives technology related advice and guidance to elderly people
Livestock yard therapist who provides animal assisted therapy for customers	*Wellbeing expert clerk* who works in consumer electronics store and can seamlessly combine wellbeing and technology together.
Elderly walker who is taking senior citizens to walk	*Virtual instructor* who is activating elderly people via internet
"Moving" A) *health kiosk clerk* who provides health information and activates persons in sparsely populated areas, B) *handicraft service provider* who is activating elderly people via different kinds of handworks,	*Communication service provider* who is helping and guiding elderly people to communicate via internet based "video conference" applications
C) *culture maker* who brings culture to homes for those who cannot go to see culture outside	*Media educator* who teaches elderly people the media usage and knowledge