CNaPPES.22

8º Congresso Nacional de Práticas Pedagógicas no Ensino Superior

E-book

CNaPPES 2022
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14 e 15 de julho de 2022

Escola Superior de Enfermagem de Coimbra

Ficha Técnica

Título
CNaPPES 2022 - 8º Congresso Nacional de Práticas Pedagógicas no Ensino Superior

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Escola Superior de Enfermagem de Coimbra

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Apoio e Revisão Documental
Gabinete de Apoio aos Projetos
Centro de Documentação e Informação

Maquetização e Adaptação de Design
Gabinete de Comunicação e Imagem

1a Edição - julho 2023

ISBN
978-989-35129-3-7

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Agradecimentos

A Comissão Organizadora do CNaPPES.22 agradece:

- Aos autores das comunicações;
- Aos revisores dos resumos e dos artigos;
- Às Comissões Coordenadora, de Programa e Organizadora;
- A todos os funcionários não docentes que colaboraram no CNaPPES e no E-book;
- À Escola Superior de Enfermagem de Coimbra;
- A Todos os que tornaram possível este “projeto”.

Os nossos sinceros agradecimentos!

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Pedagogical and learning experiences from Demola project – the facilitator's perspective

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Resumo

Co-creation of innovation projects with DEMOLA methodology is at the core of the Finnish organization DEMOLA GLOBAL's long-life teacher training. During a 10-week period multidisciplinary teams of students from different fields, representatives of project partner organizations, and teachers who are the facilitators of the innovation co-creation process work together to come up with solutions that meet the current and future challenges of organizations. This paper aims to reflect and discuss the main strategies adopted by the facilitator to support the co-creation process. The case study at focus in this paper is the Demola project entitled "Value-adding factors of electric vehicles (EVs)", where EVs are changing car performance metrics from power, gas consumption, and size to connectivity, entertainment, and autonomous driving. The key learnings and challenges of the pedagogical experiences of this project will be set at three-level: partner engagement; student engagement; facilitation of the co-creation process itself.

Palavras-Chave: Co-creation, Collaboration, Design thinking, DEMOLA.

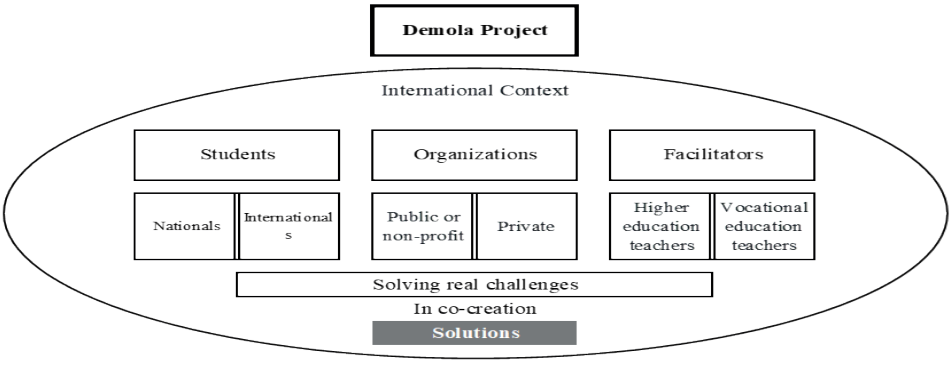
1. Contextualization

Co-Creation Portugal initiative is established together by Portuguese Polytechnics, Portuguese Government, and Demola Global, established in Tampere, Finland. In this current edition initiative, Demola Global provides to 14 Portuguese Polytechnics the Demola's co-creation process, tools, and support to facilitate over 200 projects grouped under five thematic tracks: (i) healing the planet; (ii) future of work; (iii) human beings in the modern world; (iv) byte-powered future; (v) value creators of tomorrow (DEMOLA, 2022). The teaching staff involved in the 20-week training in innovative teaching methodologies, stimulating partnerships with institutions and companies in the region, also included facilitating a specific Demola project through co-creation and design thinking processes for 10 weeks in total (from 21st March to 3rd June 2022).

Co-creation as a form of collaborative innovation, where ideas are shared and improved together, is focused on finding solutions for challenges that different social organizations (companies, public sector and third sector organizations) may face (Doorley *et al.*, 2018). Co-creation in higher education is relatively recent (Bovill *et al.* 2011; Carey 2013) as

students are often still little involved in the learning process (Mann 2008; Gärdebo and Wiggberg, 2012). Nevertheless, the benefits of collaborative engagement for faculty are recognized, such as involvement and motivation for learning, increased metacognitive perception and sense of identity, improved teaching experiences in the classroom, student-teacher involvement (Nygaard *et al.* 2013; Cook-Sather *et al.* 2014). A Demola project, consisting of an innovation platform and a university-company collaboration model for the creation of new products and services, involves three types of learners with very specific roles (figure 1).

Figure 1
Co-creation process in Demola (Carvalho et al., 2021)



- Students, known as talents, are expected to take the driver's seat in this project (responsibility) and work as a team, previously selected to be a motivated team for the theme's project and a diversified knowledge team (in disciplines, cultural backgrounds, generations, personal values, etc.).
- A project partner, usually the company representative that engages in the project by setting strategic areas of interest and thus expects, with the help of students and the facilitator, to screen insights from the project work for inspiring signals.
- The facilitator(s) that leaves behind his/her teacher's role by both setting the conditions for co-creation and helping the team through the Demola process.

The co-creation process of a Demola project is based upon Agile methodologies which are being increasingly applicable in the higher education context (Sharp & Lang, 2018; McAvoy & Sammon, 2005). Broadly consisting of a mix of design thinking, scenario approach and demo-building producing signals of change (Dieguez, 2021), this project brings together contributions from various areas (design thinking, critical thinking and creativity, project work, problem solving, among others).

The purpose of the paper is to highlight the main strategies adopted during the facilitation process of a co-creation Demola project and reflect upon them at three-level: partner engagement; student engagement; facilitation of the co-creation process itself. To achieve this research objective, this paper starts by describing the main features of the Demola project at focus, the "Value-adding factors of electric vehicles (EVs)" under the Demola thematic track "Value Creators of Tomorrow". It then proceeds by presenting the main results and reflections achieved while facilitating this project and the last section considers some final remarks.

2. Description of the pedagogical practice

The Demola process involves a 10-week scheme split into two different parts, Present and Future. In Present phase, the team works around problems and opportunities that are related to the current state of the world and the project topic. The method used is Design Research and it aims at discovering the current status of the project topic from macro-level and micro-level perspectives. By using many different tools, among which the stakeholder identification is a good starting point for the team, but most importantly by talking to people, observing them, reading reports, discovering big data, and so on, the team gathers knowledge, learnings, and big and small insights about the project topic and the people in it. At the end of the 5th week, the team submits a mid-way report, also called Present report, that highlights the main findings about the project topic landscape from today's point of view.

In Future phase, the methodology used is Speculative Design, consisting of the nature of futures work, where the team do not try to predict a certain future but rather to understand the different future possibilities. Some of these possible alternative scenarios are more possible, preferable, and plausible than others, but all share the common ground of being speculative, subjective. Again, the team gets tasks that help focus on each part of this future process phase at a time: (i) Whatifs are used to create provocative opportunities; (ii) HMW (How Might We) questions help reframe the insights and identified pin points into action points; (iii) Future stakeholders/user groups are important to think and understand what the change means on institutional and personal levels; (iv) Future solution ideas, going for quantity, because the value lies in the more unique ideas, after the most obvious/safe/feasible ones have come up; (v) Weekly signals to get practice on observing the world and identifying the most meaningful changes related to the project topic and consequence chains. At the end of the 10th week, the team delivers the final report, focusing on describing the team's visions about the different futures of the project topic.

The case study at focus in this paper is the Demola project entitled "Value-adding factors of electric vehicles (EVs)" and was a remote project run throughout 10 working weeks in the second semester of 2021/2022. The main challenge was settled around two research questions: 1) What will be the future key performance metrics from the consumer point of view? 2) How will the electrification and emphasis on software change the way we view cars? Previously the performance metrics of cars were measured in really concrete ways: power, gas consumption, size. Electronic vehicles are changing the game; now we are talking about connectivity, entertainment, and autonomous driving. At the same time the willingness to own a car is on the decline. This was the starting point and direction of the project from current state to alternative futures.

Co-creation involved a team of four students, one private company in the field of motor vehicles performance enhancement and one facilitator. The students' team is international, composed by four members, two of them from France, and a third one from Romania, all three doing Erasmus mobility in IPS (Instituto Politécnico de Setúbal), and the fourth member is Portuguese, even though native from Moldova. Students have different backgrounds but a common interest in EVs. Two of them are master students, one in Quality Competitiveness, Engineering and Management, and the other in Marketing; the remaining two are undergraduate students, one in Electronic and Computer Engineering, and the other in Business Administration.

In addition to online weekly meetings of approximately one and half hours, with the facilitator and/or partner, students were asked to work autonomously, both independently and as a group, during the Demola co-creation process. The main tools to support the process remotely were a virtual whiteboard app like Miro or Mural for accomplishing tasks regarding the Demola methodology; and Demola Chat or similar for communicating to teammates, facilitator and/or partner outside team's weekly meetings.

The project outcomes were reflected in a final report, where students started by a contextualizing framework, defining the concept (EVs) and its different types available nowadays (BEVs – battery EVs; PHEVs – plug-in hybrid EVs; HEVs – series/parallel hybrid; FCEV – fuel cell technology or zero-emission EVs), as well as establishing the problematic around the market of EVs. Five important signals were then highlighted in the report: 1) the future transport infrastructure as composed by electrified roads; 2) the high recyclability of EVs batteries; 3) Norway as having the most significant number of EVs per capita, while China is the world's largest EVs market; 4) the new form and rapid increase of charging vehicles (most rapid units rated at 50 kW, while latest ultra-rapid units are capable of up to 350 kW); 5) battery charging by solar panels. Finally, regarding how will the future look like, the discussion was centered around three main question marks: 1) Will EVs be more affordable? 2) Any solution for the batteries? Could an electric mobility service be our future? Students concluded that EVs are undoubtedly the future of transport. In the discussion over climate change, only the electric motor can provide mobility to renewable energies (either sun, wind, or water). Nevertheless, there is still a lot of effort to be made, especially in the means of transport that still uses only fossil fuels, like trucks, buses, boats, and planes.

3. Results, implications, and recommendations

3.1. Partner engagement

In this project a Portuguese company was involved as an external stakeholder. PKE Automative is a micro company in the field of motor vehicles performance enhancement located in the region of Setúbal (Moita). The company has an innovative and open mind attitude, which affords an opportunity for this project. The founder and CEO of PKE Automative was open for an interview with the students, in which they were able to ask questions related to the company's business, motor vehicles in general, and EVs in particular. After delivering the final report, students discussed and shared the findings with the partner organization in an online final meeting and the stakeholder reflected and gave feedback. The company's feedback was very useful for the students and gave the feeling that their project has a real sense.

Moreover, the focus on company's engagement in a Demola project is to explore and understand industry and society level problems and opportunities. Subsequently, Demola partners' companies were asked to reflect upon theirs' strategic interest areas, by answering to questions like: What interesting changes is your industry currently facing? What interesting societal changes and trends might bring opportunities for your business in the future? Why? However, on co-creation through design thinking, teams usually co-create a solution(s) to a company's specific problem or challenge. Therefore, to better deal with potential partner's expectations on the Demola co-creation process, the company representative of PKE Automative was involved in the project from the outset of the Demola process (e.g. team building; challenge form; design brief as the starting point; students' interview; final meeting). In addition, some activities that better elucidate this meso- and/or macro-level perspective were shared with the partner, namely: (i) students' first task on the project related to stakeholder/user group identification by using a graphical mind map visualization in Miro; (ii) the mid and final reports of the project, highlighting in the first report the insights, team's key findings on the project topic, and in the final one, inspiring signals and reasonings behind the results.

3.2. Student engagement

The multidisciplinary nature of the team – with different backgrounds but a common interest on the EVs topic – contributed for team engagement. In addition, the small group size helped them to find common interests but nonetheless didn't help them to engage as it was supposed. Indeed, not every student was involved in every single activity from the very beginning.

The synchronous meetings for the project were previously discussed with the students to find a suitable schedule for the whole group. They were initially planned to take place on Wednesdays between 17.00 WET and 18.30 WET, but considering the deadline for submitting assignments on Sundays, the weekly online meetings were later jointly changed to Mondays in the same time frame to somehow help increase students' participation and motivation in the project.

Nevertheless, students revealed difficulties in interacting with each other during the entire Demola project. Regarding communication skills, language barrier was a challenge, with some students having difficulties in expressing themselves which didn't contribute to smooth workflow. As for the use of new software, Microsoft Teams for video conferencing, team discussion, feedback, and reflection, as well as Miro and mostly Google docs (students' preferable choice) to see the team's collective progress and who is working on what were good digital solutions for a remote project and useful for collaborative activities. The Demola Chat however didn't reveal as useful as thought for team communication and interactions, but very useful for the facilitator to communicate outside team's weekly meetings.

Furthermore, teamwork with students, building trust and promoting autonomy was more difficult than thought but, definitely, rewarding. The students ended up delivering all the activities on time from start to finish.

3.3. Facilitation process

The facilitator learned the way of design thinking and Demola methodology and was able to lead the group in its step by step. Strategically thinking, the project's working weeks were divided into two main periods: first focused on preparation and forecasting regarding to what is going to be done; then, while running the Demola project, everything is a "variable" and necessary adjustments were weekly made, if needed. For the first period the facilitator weekly attended the DEMOLA GLOBAL's long-life teacher training to get to know the idea of Demola, the whole Demola process of design thinking and co-creation, including tools and tips to support facilitation. During the second period, the classes were planned previously, with PowerPoint presentations to get the students to both know and understand the weekly specific tasks, and all to-dos were checked after the classes. In this second period, facilitation also meant focusing on the ideas and workflow of the team, by engaging them in both discussion and reflection exercises.

The facilitator of a Demola project is expected to guide the team through the process and help the team focus on the right things at the right time. That is a challenge considering the traditional role of a teacher as a lecturer and more aligned with student-centred teaching and learning environments. Also, expert knowledge about the project topic is not a requirement for managing a Demola project as a facilitator, but curiosity and interest in the subject helps the facilitator to be involved in the tasks ahead and to convey that enthusiasm and motivation to the students to engage with confidence. Finally, the breakout rooms initiatives in certain weeks of the teacher training and the two planned bootcamps helped foster collaboration between colleagues from different institutions and fields of expertise, and improved knowledge and understanding of the project topic itself.

4. Conclusion

Both partner staff and student members, by working collaboratively to solve societal and/or industrial challenges through the mediation of a Demola facilitator, are in the end all learners. Co-creation basic values highlighted since the beginning of the Demola project are: (i) communication - the number one success factor, between a good and a bad Demola experience; (ii) action as more important than direction because it leads to it; (iii) curiosity by learning from others and helping others learning from you/us; (iv) diversity in many folders (disciplines, cultural backgrounds, generations, personal values, etc.); (v) imperfection acceptance; (vi) responsibility - ownership of the project. Thus, among competencies that offer significant added value to the labour market, students in Demola develop specific skills including learning and innovation skills, information, media, and technology skills, critical thinking and problem-solving, communication, collaboration, and creativity.

Students in the case study at focus have used and practiced, firstly, the skills of communication and reflection. During the online sessions students had to speak in group, had to make small presentations, and reflect upon their decisions. Outside the weekly meetings they had to create written materials as well, including self-reflections and give feedback to each other. Cooperation as a core of Demola meant working together as teammates; the facilitator tried to build a real time scenario for students to co-operate during and after the online weekly meetings. Group activities were conducted for this purpose; between the meetings, this meant that students had to stay in contact, without the help of the facilitator. Finding the right ways for communication also helped self-efficacy. Students' tasks made at home were always asked for at end of the week, and those type of activities improved the self-efficacy of the students; also, their time management, because meetings were organized on Mondays.

360-degree feedback is part of the Demola process and thus students receive continuous feedback for multiple parts (facilitators, external stakeholders, team members, and peers in different forms), and need to be engaged in giving feedback. Moreover, various assessment methods show the personal learning success of each student through the 10-week Demola process. Team members perform a self-evaluation at the beginning of the project, they are then asked to evaluate themselves at the end of the project, each one of their peers, and receive an evaluation from their facilitators. Taken together, feedback and reflection play an essential role in supporting the co-creation process and ensuring promising outcomes for all stakeholders.

To further enhance cooperation and joint reflection, a Demola hybrid project would have been very welcomed, and we could all have more "fun" together (for example, a topic related to EVs could even have hands-on stations, where students could work in labs or pilot plants to develop their ideas). Alternatively, at least an onboarding week on a face-to-face scenario could improve teamwork and communication, as well as planning warm-up games and icebreakers at the beginning of the online meetings to get to know each other in an easier way and more confidently engage themselves in the tasks ahead.

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