PROJECT NEWS LETTER 2, JANUARY 2022

Agenda

Upcoming events NICCoLLa

27 January 2022: ME LAB UAS

10 February 2022: ME Avans UAS

September 2022: ME UPV

19 - 23 September 2022: ISP3 at UPV

23 September 2022: Final conference at UPV

ISP2 program 1 - 5 November 2021 Avans Breda

By Angèle Geerts

During the week of 1 November students from Finland, Spain and the Netherlands have been working together in the second Intensive Study Program (ISP) of NICCoLLa. Students of Nursing, Social Work, Technology and ICT joined during this week.

After the opening session and a debate about the value of technology for the professional in health and welfare and the impact for future professionals, the students attended the first workshop. During the workshop they discovered the Getlab of Avans, explored different technologies and how they are used in care. In the afternoon the student teams were formed and each team started to explore several challenges. Each challenge included the assignment to find a technological solution for the health and social-emotional issues of the client. There were different case studies: about a teenager, a person of middle age and an elderly person for example. Four days to find a solution for a complex case. With the help of the different workshops of the NICCoLLa team, representing the different IO1 courses and IO3, and workshops of professionals students worked very intense together during the week.

Different professionals gave workshops to the students about how they use technology in their work. Bart Hagtinius of the Probation services Netherlands showed students different ways of how technology is used in the field of Probation. Teun Aalbers, owner of GainPlay Studio told about the use of serious gaming in the world of health and welfare and finally Wirna van Gastel, advisor care innovation at Avoord, modern elderly care showed the students how her organization is creating innovations in elderly care at home and in the institution.

For the future professionals it was very interesting to discover the possibilities that are already used in the field, to discover that so different fields of care and welfare can use technology and that professionals are also exploring and developing their own competences regarding technology and how to use this in their work.

At the end of the ISP the different groups participated in the festival of the first year students of Social Work of Avans Breda. In a stand each group presented the outcome of their challenge to 300 students and teachers. At the same time the Social Work students presented their outcome on other topics, like intercultural working, safety in society, poverty e.d. In dialogues students discovered even more possibilities to work together. The reward of most impressive result was given to one of the NICCoLLa teams: the jury was impressed about the fact that in such short notice of time that time developed an app for a client that was tailor made, customer friendly and helped the client to overcome his problems.

It was an intensive week, in so many ways. Not only because it was a full program with lots of different perspectives, but also because students really lived the language gap between professions and overcame it, learned new perspectives by working together, and found great solutions for complex cases.

ISP 2 Student experiences

HOW IT IS TO WORK ON AN ISP (NICCoLLa)

WHAT IS AN ISP?

An ISP is an Intensive study program in which we have had to find solutions to some given situations, for example there was a challenge about using VR technologies in order to help nurses and other professionals to be ready for a real operation similar to a training course but done on VR, another challenge maybe some sort of technology for monitoring glucose and deal with the generated information.

HOW WAS IT TO BE A BETA TESTER?

Going into a project that was still also being developed was a fun yet at times confusing experience. The first day when we got into the class, we as a group thought that it was confusing. After the first day it felt like the teachers also got more used to working on Zoom and using this online format. I could see that they got better at explaining what we had to do, and they were always open for questions. The overall experience of the group is that the project is a lot of fun and we cannot wait to see what this project will bring in the future!

HOW WAS THE GROUP?

The group was composed of 5 Spanish students, 1 Finnish and 1 Dutch student. We all had different things we found interesting about working with a diverse group of people. We enjoyed putting our heads together as people from different sectors and seeing what kind of plan we could come up with for this project. That was the key of this project, trying to combine the knowledge from both sides in order to find a good solution for a health and wellness issue and check if the implementation can be possible. Our group has been very dynamic since the beginning, we keep contact via a Discord server where we have different channels to put on some of the links, references, roles or chat in general. Also, we had used Google Docs and Google Slides to create documents and presentations in a collaborative way. Defining how we were going to work was not a big problem because we all know how those platforms are used.

WHAT HAVE WE DEVELOPED?

Imagine you have an old person living it's retirement years in it's own house, probably alone. This person is, in fact, dependent in some ways, so a person must be always in touch with it, right? That's where our product kicks in. With RavenWatch, an innovative SmartWatch developed by ICT students, you can nearly make a dependent person have an independent life again. You can see all his information in real time: vital signs, GPS, hours that he has slept ... all of this only installing two simple apps for already existing devices: one for the SmartWatch and another for the mobile phone of the caregiver person.

WHY WE CHOOSE THIS TOPIC?

We choose it because it allows us to be able to challenge ourselves given real life situations in addition to applying our skills and experience in IT, social works and nursing fields, moreover it forces us to look deep into the client's perspective and think if the end product will be user friendly.

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NICCOLLA'S PROJECT OR HOW TO IMPROVE HEALTHCARE THROUGH TECHNOLOGY AND KNOWLEDGE

With the modern improvements in healthcare, quality of life and technology advancements, life expectancy kept growing. But there is no progress without effects and new problems showed up.

From the NICCoLLA project, some of these actual problems were shown and prepared for students from different countries and fields of study, so new and innovative solutions can be developed through ongoing of their collaboration. The NICCoLLA project requires different areas of knowledge to create a product that enhances people's lives. In the beginning, we had problems with our group because we had only students from one field of study, engineering. But soon this problem was solved with the arriving of a colleague from the social care area who gave us the experience that we need for this kind of project.

Once our team was finally completed, we started figuring out how to work as a group which was interesting since we had people with different fields of knowledge and we had to figure out how to compliment each other. For our team, the challenge we were trying to solve was "Support medication taken by elderly persons and remind of medical appointments". In this challenge, a customer-oriented solution had to be developed for elderly people for helping them with their medication. Furthermore, that possible solution had also implied concerns about giving information, feedback and taking care of the user status through a user-friendly solution.

As a team, we had to face several challenges to create an appropriate solution. One of these problems was the ethics involved in collecting and showing data around. Another big problem we had was about keeping our users' privacy on a good level since we don't know much about laws in this area. We had to ask some professors about this, and with the information and little tips, they gave us we could figure out a way to resolve this. In the development of the solution for this challenge, we learned about technology applied in health and social care, the actual legal paradigm for these kinds of products and the ethics we should consider for the development and usage of them.

In addition to that new knowledge, we also had the social component in the ongoing project. We have met people from other countries with whom we have spoken, laughed and, most important of all, we had the opportunity to enjoy the experience of an Erasmus project differently, even with the current limitations since we are not working in a face-to-face way. It has been an incredible experience that allowed us to discover new technologies, areas and of course, friends.

GLUCOSE SMART MONITORING (GeeSeM)

INTRODUCTION

The past weeks, we have delved into the experience of the NICoLLa project. We have been able to work together with students and teachers from other countries and cultures, so we have been involved in a very enriching experience which has allowed us to discover several interesting things and ways of working. Additionally, we dealt with the different timetables not only because of different time zones and different mealtimes.

Parallel that, we have acquired new knowledge of both technology and healthcare. In our experience, we have been facing a challenge about diabetes, so healthcare students have explained to the rest what diabetes is and the problems they face in their routine as nurses, as well as ITC and engineering students talked about different technology we can use to improve that routine. We are lucky that in our group we have met people from very different profiles, and we all have been involved and interested in participating, giving our opinion encourage us to develop a rather interesting solution while we have been able to learn a lot from our colleagues and teachers.

OUR PROJECT

To begin with, we selected one topic that was our starting point. So we decided to develop a solution for diabetic elderly people. Due to the primitive way of measuring the glucose levels and that elderly people are not usually skilled in new technology, we decided to develop a continuous and automatic solution that sends all the information to a doctor with a Bluetooth patch.

OLD FASHIONED WAY OF MEASURING THE GLUCOSE LEVELS, PHOTOMIX COMPANY

To continue, we decided the gadgets that we could add, to make the patient's experience better. First, we determined adding an android based smartwatch that would be sending all the information to a server that will be operating the data with the purpose of getting personalized results to the user. Then we added a voice assistance created through a raspberry pi, this device will be communicating with the patient and will enable him or her to do videocalls with the doctors, using a small camera connected on the voice assistance. Finally, we focused on developing a phone app that will make the work easier for nurses, doctors and relatives of the patients, with this app, the user could see how the glucose levels are of the patient on that moment, as well as the last reports of the users. Using the app enables the user to see all the data quickly, using different graphs and diagrams.

In conclusion, thanks to our work and the acquired knowledge we have been able to develop a better solution that helps diabetic seniors to have a better life.

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Description of Ethics for NICCoLLa

By Jay MacDougall
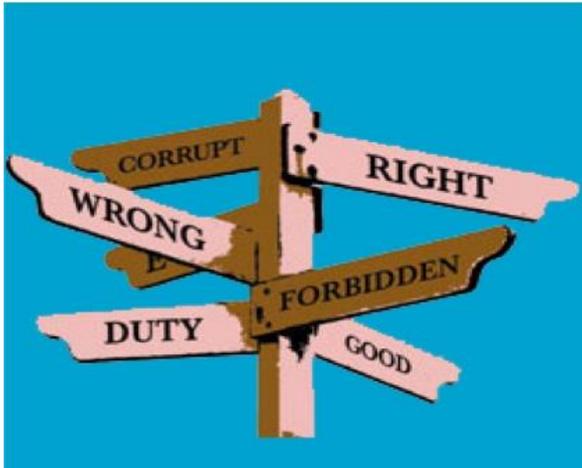
As technology continues to progress, and new innovations begin to change the way we live our lives there will need to be people who can take ethical reflection seriously. Every new piece of technology creates new challenges. Our moral worldviews will need to grow and develop along side this new technology. This is especially true in regards to Health care and technology. Ethics boards around medical research have been common since the second world war, so it is natural for ethics to be discussed in healthcare. Any robust programme that deals with the cross section of technology and health would need to include a comprehensive discussion of ethics.

That is where this course comes into the NICCoLLa project. The ethics course is design to teach students how to reflect ethically on moral dilemmas. The purpose is not to present a moral view for the students to follow, but allow them the tools to create their own moral world view. What the final view the students have at the end of their course is ultimately irrelevant, the course is meant to teach student how to come to the conclusions themselves.

The course is based on a principlist approach to ethics. rather than focus heavily on various moral theories, as is often done in more traditional ethics classes, or ethics as found in philosophy programmes; this course will look at a number of ethical principles. The principles approach is quite common for writing codes of conduct. The basis of it is that students examine a number of principles that are commonly agreed to be good, but there is disagreement on their meaning. For example, you would be hard pressed to find someone who says that Justice is not "good" but finding two people with the exact same definition or view of what justice is, would be next to impossible.

Every lesson students will take the first half to examine an ethical principles, such as Justice, informed Consent, Respect for Autonomy, or Confidentiality. Students will examine different views of the principle while discussing their own viewpoints and how they come to understand them. The second half of the lesson deals with a case study. Students will look a specific dilemma to see how the principle applies in this case.

The case studies can change year to year. A case study bank is being created that will have a number of different cases for the teacher to choose from. For example when dealing with informed consent or respect for autonomy, the question of mandatory vaccinations might come up. Case studies can be changed based on the group of students, or what is happening in the world. The COVID-19 pandemic presented a number of new interesting topics for discussion. Furthermore if the group of students is mostly engineers, more engineering based cases might be chosen. This allows for a fluidity of the course that can keep the course fresh and tailor made to the students.

As mentioned in the beginning, the final viewpoint of the student is irrelevant. It is only the journey that they took there that counts in anyway. Students need to show their final viewpoints but I is how they can defend them that is important. The two main assignments are an essay in which students defend their viewpoint on a dilemma. They are only assessed on how well they defend that position. Students also do a presentation in which they show multiple sides of a dilemma, this is to show the students can see other points of view.

At the end of the course students will have developed tools to better understand ethical and moral dilemma. Through the case studies the course can be constantly updated in order to keep up with the times and be tailor made to the students interests. Students will develop their own moral world views that allow they to better understand their field, the relationship of healthcare and technology and most importantly themselves.

Network for Innovative Care Competence Learning through Labs

AN ERASMUS+ STRATEGIC PARTNERSHIP

We are the Network for Innovative Care Competence Learning through Labs: `NICCoLLa'. Our network consists of:

4 consortium partners:

- Avans UAS (The Netherlands)
- LAB UAS (Finland)
- Universitat Politècnica de València (Spain)
- Instituto Pedro Nunes (Portugal)

5 associated partners:

- Sensing Future (Portugal)
- Innovation Centre Imagine/Amarantgroup (The Netherlands)
- Pacmed B.V. (The Netherlands)
- Harjulan Setlementti ry (Finland)
- Asociacion APSA (Spain)

We aim at modernizing current curricula by developing methodologies and transdisciplinary courses focused on teaching how to use technology and ICT solutions in healthcare & well-being settings, including theory and practical experiences.

LAB University of Applied Sciences

avans university of applied sciences

UNIVERSITAT POLITÈCNICA DE VALÈNCIA CAMPUS D'ALCOI

IPN INSTITUTO PEDRO NUNES

NICCoLLa building a bridge between ICT, social and healthcare

By Jordi Linares

We are used to being surprised by technology every day with new devices and possibilities, and we have the wrong perception that these changes are taking place in a linear way. It's not like that.

In the technological world and, especially that which has to do with the technologies that we know as ICT, we usually make mention of the famous Moore's Law which, in a very simplistic way, we can summarize that electronic devices come to double their possibilities every 18 or 24 months. Without going into exact details or its possible non-continuity in the future, what it implies is that since the 60s of the last century we have had a non-linear process of evolution. In fact, doubling every 2 years is a profile we call exponential.

The human being is not prepared to understand what 'exponentiality' means. Exponentiality in an area such as the automotive industry would mean that, at the same price, every two years we could have a vehicle capable of going twice as fast. Obviously, exponential evolution is not present in all fields of engineering. But when it comes to the ICT world, this is the general case.

But there has always been a great stumbling block. The evolution of hardware does not imply the evolution of the ability to solve 'new tasks' on the part of computers and other devices (smartphones, tablets etc.). More speed or memory capacity, although these increase exponentially over time, it does not imply that we can provide solutions previously only possible by a human being.

Artificial intelligence has been a field that, already in its origins, in the mid-1950s, set itself the challenge of conquering new possibilities. New possibilities implies that computers can solve problems previously not possible with them, new steps to climb in their long career in trying to reach our full possibilities as human beings.

Artificial intelligence, with a very irregular evolution and even with great disappointments, changed radically in 2012 when, using a neural network integrating some elements solved in later years and

with hardware based on powerful graphics cards, it changed the world forever. Deep learning was born, a field of machine learning that in turn is a subset of artificial intelligence, and with it, we have finally climbed a new step in the achievement of machines solving problems that were only possible by human beings.

It does not seem that this is the final step in this race to achieve machines at our height in all our potentialities, but without a doubt it is a before and after.

The field of social and healthcare is, almost without a doubt, one of the sectors that will suffer the most benefits and changes shortly from this new step in computer science.

Devices capable of recognizing objects, identifying elements of the environment, understanding what we say in our own language, responding also in natural language, assisting patients and professionals in all their activities, minimizing risks and possible errors in our work, making employees feel more secure, that people with special needs can have virtual or even future robotic assistants that allow them to carry out their daily activities and work, make an automatic and intelligent follow-up of patients that allows professionals to focus on more fundamental and less repetitive tasks …. the new world of artificial intelligence, new interaction devices and synergy with patients and professionals has begun.

It is very important, and this is what the NICCoLLa project tries to do, that the technological world and that of social assistance and health, work hand in hand in the design of new tools with a single objective: to improve the lives of everyone, patients, clients and professionals.

Multidisciplinary teamwork promotes learning and innovations

By Pirjo Tuusjärvi, Annamaija Id-Korhonen, Arja Sara-aho, Hannele Tiittanen

The NICCoLLa project aims to improve education in the field of social and health care, engineering, and ICT. The purpose of the curriculum development is to increase students' knowledge of the use, implementation, design and development of innovative technology solutions and ICT in the health and wellbeing sector. (Tuusjärvi et al. 2020.) An important part of the development of the course content has been students' participation in the process.

One of the key activities carried out to achieve this goal are intensive study programmes (ISPs) for students from project partner countries (Finland, Spain, Netherlands) and different fields of education. Alongside the development of the curriculum and course content, a key part of an ISP is to promote the students' ability to work in multidisciplinary teams to innovate user-driven technological solutions in the field of health and wellbeing.

The first ISP of the NICCoLLa project was organized by LAB University of Applied Sciences. Due to the Covid-19 pandemic, classroom teaching and travelling were prohibited and because of that, the ISP was implemented online. The two-week intensive programme was based on challenge-based learning. Challenge-based learning is a pedagogical approach where complicated real-life problems are given to students to be solved (Malmqvist et al. 2015). Such learning supports collaboration between higher education and working life, where students,

- recognize the differences and similarities in the use of digital services and wellbeing technology in
  social and health care in the project partner countries,
- identify future technological solutions and innovations for social and health care,
- analyze the ethical aspects of health and wellbeing technologies, and
- apply service design and co-creation methods in the development of technological solutions for social and health care.

During the ISP, students worked in multidisciplinary and multicultural teams and attempted to produce potential solutions to the real health and wellbeing

student teams was based on a service design method, and they adopted a co-creative perspective during the process.

Solving real-life challenges

The student teams sought to solve the challenge case by following the four stages of the service design process, referred to as the double diamond model (Naar et al. 2018). The four stages are: discover, define, develop and deliver (Figure 1).
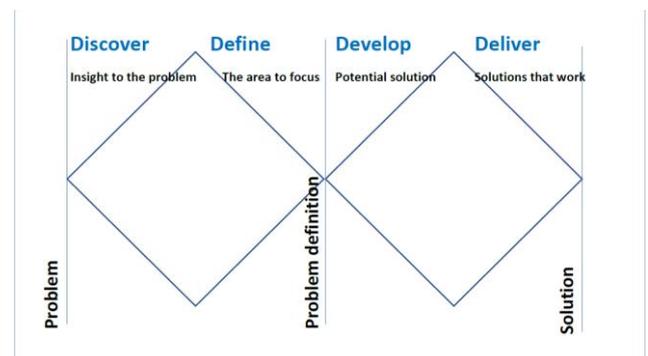

Figure 1. Double diamond model. (Naar et al. 2018, edited)

The first phase was to **discover** the problem area by gathering as much diverse information as possible about the problem, empathizing with the needs of the target group for which a new solution was being developed.

At this point, the student teams were given a very broad description of the challenge cases, and they needed to find as much information as possible on the problem. It was important to see the world through the eyes of different people involved in the case: the patient, the clinician, the caregiver, or other stakeholders in the system. The aim was to seek information and the needs of target groups to serve as inspiration for new ideas.

There were eight challenge cases from which the student teams chose four challenges to solve. These were:

1. To support medication taking by elderly persons and remind of medical appointments,

2. To improve quality and comfort in long hospital stays, reducing stress, pain, and uncomfortable treatment,

3. To find new technologies for improving the independence level at home of people with some

degree of need concerning specific control and assistance, and

4. To monitor blood glucose levels for elderly users.

The second step in the process was **defining** (making sense of) all the possibilities identified in the discovery phase. It may happen that the identified problem needs to be redefined, expanded, or contracted based on the gained information and new ideas. The goal at this stage was to create a clear understanding of the challenge case and the agreed problem. Additionally, visualization was used to highlight how the different parts of the service link together (Figure 2).
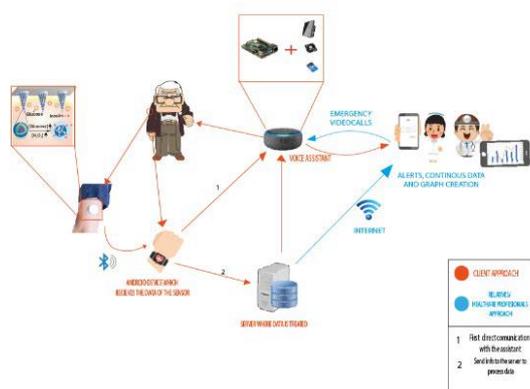

Figure 2. Glucose monitoring solution for the elderly, general scheme of the GeeSeM service (Gisbert et al. 2021).

For example, a stakeholder map visually shows who is involved in a particular service and how they are connected to each other. A consumer journey visualizes the path of how the user experiences the service, including the user's interactions and feelings.

The third stage in the process was **development.** The aim was to generate a solution which could be a prototype in the form of text and visualization, describing the solution. The fourth phase was **delivery.** The student teams planned how to evaluate the solution and how to launch the developed solution. Some teams wrote a blog to deliver their solutions.

Multidisciplinary co-creation and learning processes

As the student teams had a common challenge to solve, different disciplines offered different points of view and competences to solve the challenge. Technological students contributed competence in the development of technological solutions, and students of social and health contributed their competence concerning user perspectives and social and health care. The student teams worked using a co-creation approach when designing the challenge solutions.

Co-creation is essential in the development of health and wellbeing technologies. The process includes a description of the value chain, the service or care production process, a description of the current activities from the clients' perspective as it occurs now, a description of the target situation, including what the client really needs and how he or she experiences the process. (Korte et al. 2020).

Co-creation is empowering and pays attention to the voice of each participant. It also has a unique influence on the participants, the knowledge created, products and services developed, and the potential for their implementation. Co-design uses the tacit knowledge of the participants. The co-creation process ensures collective ownership of outputs created and makes them visible (Langley,

Wolstenholme, Cooke 2018). The co-creation approach is based on five principles, which are: 1) equal participation, 2) recognising different aims of participants, 3) finding common aims and interests. 4) from ideas to concrete doing, and 5) license to act differently and fail also. Suitable places and counselling, timing, manuscript, and planned processes are also necessary. Emotions during active process should be accepted, respected, and encouraged.

In processes promoting health and wellbeing it is important to notice that the language used matters. When we want people to engage positively in their self-care and to work with professionals on their journey to recovery and good health, it is important to choose positive language instead of negative blaming words. Additionally, engaging people matters, the place matters, and the vision and value matter, as well as creativity and fun (Davies et al. 2013).

Customer value-creating activities should be identified together with each partner (i.e., medical staff, companions and other customers) in their service value network. Each type of customer co-creation activity should have a positive effect on the core value of service delivery, including the perceived service quality and service satisfaction (Kim 2019), Co-creating something together with patients and service providers has a greater impact on the perceived service quality and service satisfaction. It is crucial to add value to the services offered to the elderly patients to avoid vulnerability and to recognize customer characteristics in promoting of wellbeing in the context of health care (Jiyoung 2019). Key elements in the value co-creation for advanced technologies in health care services include ease of access, credibility, and the intention of patients to participate in value co-creation in terms of personal, social, and economic experiences. The realization of the value co-creation promotes satisfaction, and recommendation of services (Lee 2019).

Student feedback on multidisciplinary teamwork and a real-life challenge

The students found the ISP week and the challenge-based learning interesting because they were able to develop a real project from start to finish. In the teams, students had different and daily changing roles, such as chairing for the day, responsibility for communication, documenting and reporting on their daily work. According to the feedback, the daily change in the roles strengthened the members' commitment to the teamwork.

Working in multidisciplinary teams taught the students to see challenges that they may face in real working life, and this also received positive feedback. According to feedback from technology students, the opportunity to work with social and health care students increased their understanding of clients' ability to use and benefit from the technological devices or digital applications when developing such solutions. In addition, discussions in multidisciplinary teams and solving challenges with technology, increased the interest of social and health care students in new technology.

"The course stimulated and created a zeal to learn more about technology."

"Everyone had an opportunity to take up active roles which was a very good idea. This improved our commitment."

According to students' feedback, they enjoyed the multidisciplinary teamwork and were ready to increase it.

In the first phase, it was challenging for the group to define customer needs and possible solutions to the given challenges. The students searched for information on the challenges which they had private-specific experience of (e.g., grandparents or patients), or had an interest in respect of their field of study (e.g., technological opportunities). Therefore, the students would like the teachers not only to ask if the tasks were done, but also to provide ideas and a wider perspective to the challenge.

The teachers were available to the students daily, visiting the groups and supporting students' work. However, even more feedback during the ISP week could have improved the students' work and a named team mentor for each team during the entire working process could have been beneficial.

According to the student feedback, online learning can be an effective and beneficial way of learning, but some sort of interactive virtual gamification could also be included in the study programme. In the time of the pandemic and studying mainly online, students put forward the idea that during e-learning, they could get together through a real-life

game to improve their learning and interaction with each other. As Serdyukov (2021) notes, learning in an online environment disrupts social relationships. Therefore, all opportunities to promote student interaction during online work should be taken into use.

Overall, the implementation of the ISP weeks online and the chosen learning processes received positive feedback from students. The students were willing to put more effort into learning online if they found it interesting and challenging enough.

Conclusions

The implementation of the first intensive study programme of the NICCoLLa project shows that challenge-based online learning promotes active learning processes in international teams. Challenge-based teaching and learning is an excellent pedagogical approach to challenge the students and include real-life cases in the course. In addition, a multidisciplinary approach and international perspective makes it attractive and motivating for higher education students to broaden their areas competences. Multidisciplinary working, discussions, sharing ideas and understanding different viewpoints are essential when the aim is to solve complex tasks and to innovate new solutions for working life needs.

The experience of the ISP will be utilized in the next task in the NICCoLLa project, which is to prepare six, five-credit Massive Open Online Courses (MOOCs), for a total of 30 ECTS. The content of the courses combines technology, care, and well-being. These will address, for example, future technologies in social and health care, ethical issues in technology, patient safety and the development of new technological solutions with professionals and clients or patients.

In the future, MOOC courses will provide an opportunity for students to study independently, regardless of time and place. In this sense, teachers developing MOOC courses will face challenges. The challenge includes how to include real-life cases in online learning processes and, also, how to create such interesting and engaging online courses, that they manage to get students interested in the technological solutions used in social and health care.

The NICCoLLa project will have a broad impact on social and health care in the future. This will be achieved by promoting education that facilitates the development of the technical skills and competences of social and healthcare professionals to provide digital services to clients and to guide them in the use of different devices. Also, by improving the expertise of engineers to develop new technological solutions and digital services for patients and clients in social and health care. The development of

education of "future-proof professionals" will also facilitate the application and adoption of new wellbeing technology to promote client wellbeing. In addition, future social and health care professionals, as well as engineers, will need to be competent to innovate social and health care technological solutions and take into account the ethical aspects of health and well-being technology.

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