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# Developing Online Courses for Digital Soft Skills: Experience of a Pan-European Project

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**Abstract:** Digitalization has been a part of higher education institutions for years, but the needs of society and the experiences of COVID-19 set new demands on the digital competences of educators and learners. Improvements of digital and transversal competences are needed among European educators and learners to ensure that everyone can live, work, and study successfully in the digital age. This paper describes the work undertaken in the Erasmus+ co-funded project “Digital Soft Skills @ Ulysses”, which aimed to address the digital soft skills gap. Initially, digital soft skills frameworks were created for both learners and educators. Based on the frameworks, 12 online courses were designed and created to support the development of educators' and learners' competences. The courses support modularity, so that trainers can easily customize them as part of their own courses and use them to promote the development of digital soft skills with high quality. Digital badges obtained from the online courses make it possible to demonstrate competence both in studies and in working life. This paper aims to describe and to share lessons learned from designing and development of digital soft skills courses in innovative learning processes across international network learning communities.

## Introduction, importance of digital soft skills

An adequate level and attitude towards digitalization has been in the center of attention of European authorities at least since 2010 when the first digital agenda for Europe was suggested for the decade 2010-2020. It has been recently followed by the second digital agenda for Europe 2020-2030 (Ratcliff et al., 2022). Very concrete aspects and initiatives stem from these documents, e.g. digital single market, support of digital literacy and accessibility, improvement of digital skills in general and in line with development of soft skills. Developing digital soft skills is seen as crucial for the efficient implementation of digitalization to minimize potential risks and maximize benefits so that digitalization remains a good servant and does not become a bad master.

According to the European Framework for Digitally Competent Educational Organisations and the Digital Education Action Plan (2021-2027), supporting educational and training institutions to take up digital technologies is a prerequisite, especially taking into consideration the lessons from the COVID-19 crisis. Triggered by pandemic lockdowns, technology has been used at a scale never seen before in education and training. In addition, the 2020 open public consultation on the Digital Education Action Plan reveals that, due to the Covid crisis, people were obliged to turn to digital skills even if they were not used and trained to do so. 60% of the respondents felt that they had improved their digital skills during the crisis, and more than 50% of respondents want to do more (European Commission, 2020). Thus, there is a real need to improve digital and transversal competences to ensure that everyone in Europe can live, work and thrive in the digital age.

This paper captures the activities performed within the Erasmus Joint Partnership Project Digital Soft Skills D2S@Ulysses carried out as a satellite project of the European University Alliance Ulysses. The objective of the paper is to describe and to share lessons learned from designing and implementation of digital soft skills (D2S) courses in innovative learning processes across the international network learning community of six European universities.

The international network learning community was inspired by the existence of the European University Alliance Ulysses consisting of six partner universities, i.e. University of Seville in Spain, Université Côte d'Azur in France, University of Genoa in Italy, Technical University of Kosice in Slovakia, MCI | The Entrepreneurial School in Austria, and Haaga-Helia University of Applied Sciences in Finland. Working within this pan-European consortium required

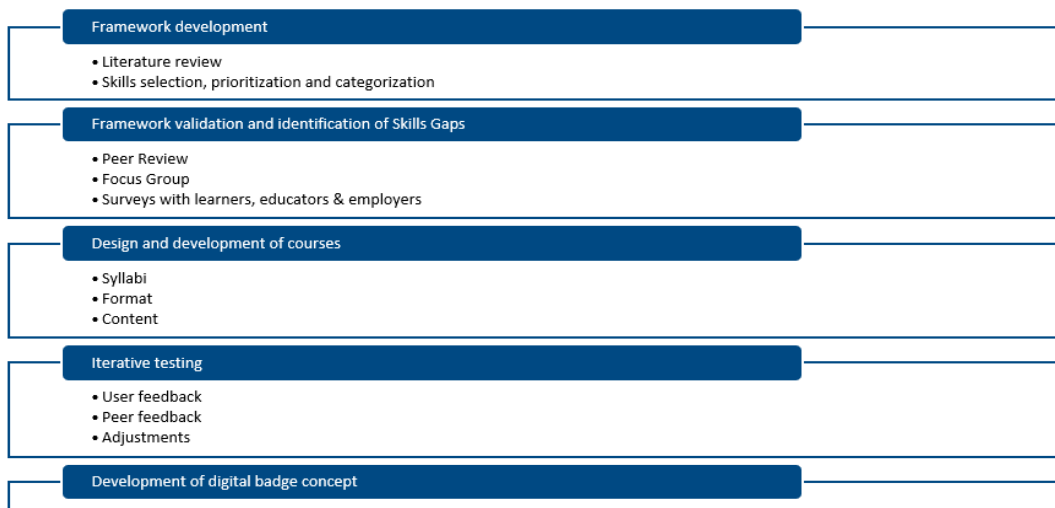
the project team to deal with the issue of digital soft skills development from different perspectives and cultural backgrounds which brings another added value to the research and educational outcome.

The paper is structured as follows. The first subchapter provides a literature overview related to the topic and captures steps performed to realize the objective of the research. The second chapter describes the development of the digital soft skills framework as a basic pillar for the creation of courses on digital soft skills. The following chapter explains the process of identification and verification of the learning needs of educators and learners in terms of digital soft skills. The fourth chapter analyzes sets of feedback and recommendations to improve the quality of courses. Consequently, the creation of courses on digital soft skills for learners and educators is described. Finally, the usefulness of digital badges is explained. The concluding part summarizes outcomes and practical implications in shorter as well as longer terms.

## Study

There is an ample literature about the urgent need to develop digital skills for the different stakeholder groups targeted by this project. Several systematic reviews about university teachers' digital competence confirm that teachers have a moderate level of digital skills (Bilbao-Aiastui, Arruti & Carballedo Morillo, 2021) and recognise the absence of certain competencies, especially those related to the evaluation of educational practice (Basilotta-Gómez-Pablos et al., 2022). In Spain, specifically, there is a significant interest in digital competence of teachers and students in higher education (Peters et al., 2022). Recently, the Joint Research Centre and CRUE (Mora-Cantallops et al., 2022) have analyzed the level of teaching digital competence perceived by the teaching staff. This study concluded that teaching staff shows a higher level of competence in professional commitment and digital content. In another systematic literature review, Esteve-Mon et al. (2020) found that whilst university teachers have an increasing level of technical digital skills, competences regarding the pedagogical use of digital technologies, including for teachers' own professional development, were not as advanced.

Regarding the level of digital competence of students, a survey by the European University Association (2021) highlights that the lack of digital skills is the primary barrier toward student learning success in the current digital context. According to Cabero-Almenara (2022), students have an average level in digital competence. More concrete results are shown by López-Meneses et al. (2020), who analyzed the digital competence of a sample of Italian and Spanish students. The results showed that information and data literacy, and communication and collaboration are the competences more developed among university students.



**Figure 1.** Research and Project Activities Procedure, Source: own elaboration

Research and project activities were based on several steps (see Figure 1) that combined theory-led, conceptual work with validation of outcomes through the key stakeholder groups, design and development of online courses and iterative testing by user groups and peer feedback.

The project team carried out a review of a range of existing relevant skills frameworks in the area of digital skills, soft skills and future skills, which were used as a basis for the framework development. Based on this work, a draft skills framework was developed, which was first extensively discussed in the peer group and then validated by learners, educators and employers through online surveys for each of those stakeholder groups and a student focus group. The feedback received was used to both confirm that the skills areas identified were relevant, and to highlight further skills gaps seen as important by stakeholders. Consequently, the project team designed and developed a range of digital soft skills courses for learners and educators in an iterative fashion. First of all, course content and learning outcomes were described in syllabi which were shared and checked for consistency across the program. Key design aspects were agreed based on existing MOOC standards. Once project specific design guidelines were agreed, development started at each partner institution, with all development teams continuing to seek formative feedback at various stages of development through user testing with the target groups and peers. Finally, a general framework for credentialing the digital soft skills acquired in the online courses with digital badges was proposed and will be implemented as part of the European University Alliance “Ulysseus”.

The remainder of this paper describes the activities carried out in the D2S project in more detail, presenting the outcomes of stakeholder consultation and giving insight into the design and development processes as well as lessons learned from the collaboration across six European countries.

## Developing the D2S framework

As one of the first activities in the project, the team carried out a comprehensive literature review of existing competence frameworks in the areas of digital skills (DigComp, DigCompEdu), soft skills (SPOCC), and future skills (Ehlers 2020, OECD 2020, World Economic Forum 2020). This comparative analysis resulted in the collection of a large pool of skills and was followed by an analysis geared towards distilling competence areas that were integral to all of them, including collaboration, communication, and problem solving. In an iterative, collaborative process, skills were defined, discussed, clustered, and finally selected for inclusion and prioritized. This led to the first iteration of the D2S framework, which consisted of the competence themes “Developing Me”; “Engaging with Others”; and “Acting Now”. As it was felt that the existing frameworks lacked a focus on competences that are specifically geared towards more agentic, creative and future focused approaches, after much discussion, a fourth area was added, “Creating the Future”.

For each of these four themes, three key skills were selected collaboratively by the project team.

**Developing me:** the first, fundamental theme focuses on the individual human being living and acting in a digital space, and on the competences required to maintain a positive identity, well-being and foundational digital literacy to navigate a complex world.

**Engaging with others:** this category comprises skills for successful interaction in the digital space with at least one other person. The sub-skills included here are digital collaboration, communication and influencing/leadership.

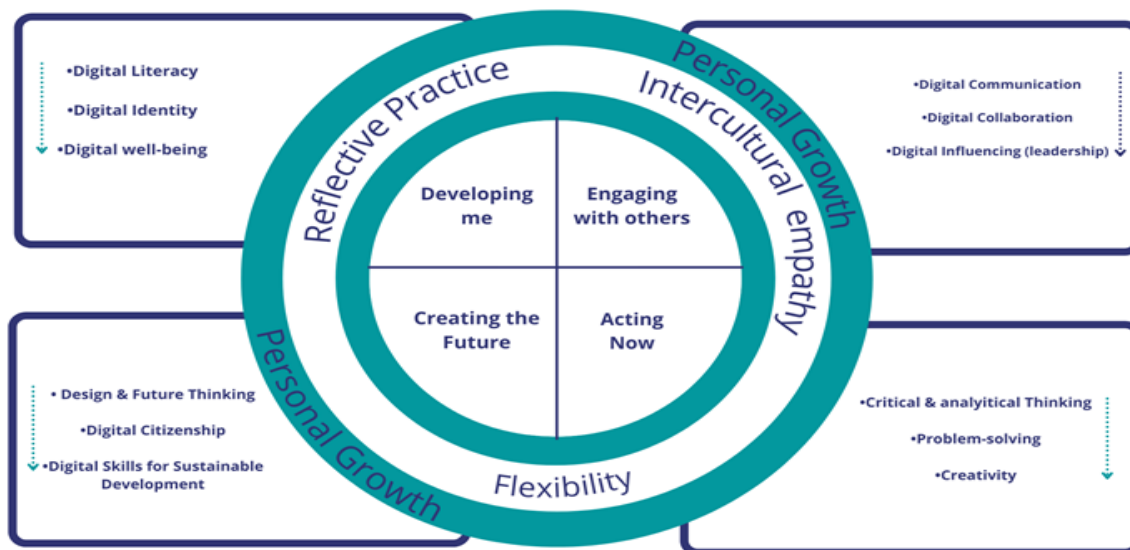
**Acting now:** the three skills listed in the category “Acting Now” refer to skills on an operational level, necessary for individuals to be successful in today’s world. This includes problem-solving, critical & analytical thinking, and creativity.

**Creating the future:** this category consists of skills which are particularly relevant on a strategic level with a potentially long-term impact. They are geared towards agency and future capability and included design & future thinking, digital citizenship, and digital skills for sustainable development.

It should be noted that whilst many of these competences are relevant for all spheres of life, the focus in this project was on considering them through the lens of digitalisation. In some cases, this means using digital tools to carry out activities, in others, it means navigating the digital world successfully, and in others still, it means being reflective of the digital environment as an increasingly ubiquitous context. With this in mind, the team felt that there were more universal competences relevant for all themes. Further research was carried out and the framework was expanded to include what we called “cross-cutting competences”: intercultural competence, flexibility, and reflection, which are represented in circles crossing all competence themes in the framework. After further discussion, a second circle was added, which emphasized the focus on personal growth as an important cross-cutting concept for learners.

The outcome of this conceptual part of the project was the D2S Framework for Students:

# D2S Framework for Students



**Figure 2.** D2S Framework for Students, Source: D2S@Ulysseus project

Building on the work carried out for the student framework, the team then discussed how a competence framework for educators would differ. It was agreed that in the contemporary context, educators are also learners when it comes to digital competence. Therefore, the framework developed for students could serve as a basis for educators, however with a second layer, meaning that educators would not only need to acquire the competences defined for students as learners themselves but at the same time be in a position to teach them. This is also true for the cross-cutting competences, with the only distinction that for educators, personal growth as defined for students was replaced with “personal and professional development”, reflecting their more mature experience and embeddedness in practice. The framework was developed over several circles of feedback amongst the project team, and a focus group with students from across the Ulysseus Network was also carried out to include the perspective of learners early on. These feedback loops helped refine and clarify several aspects of the framework. Finally, the framework was used as a basis for developing a survey designed to validate the skills defined including the perspectives of the key stakeholder groups. It should be noted that the framework with four categories, three skills per category and three cross-cutting competences does not aim to be all-encompassing. We have striven to create a tool that is useful and practical and depicts the competences that are deemed as most important.

## Identification and verification of learning needs of educators and learners in terms of digital soft skills

The D2S team conducted surveys for students, educators and also potential employers, to identify their needs in Digital Soft Skills. To this end, survey instruments were developed for each stakeholder group, based on the D2S framework. The Digital Soft Skills Survey for Students contains six questions on personal data and twelve questions on digital soft skills and academic programs. The Digital Soft Skills Survey for Educators has five questions on personal and general data, one on the challenges encountered in pandemic context and seven on digital soft skills and D2S framework.

In total, 2023 students - learners and 638 teachers - educators were surveyed from Spain, Italy, Austria, Slovakia, Finland, and France. 57.09% of students are women. 50.67% are 20-24 years old. 33.47% are from University of Genoa; 27.93% and 22.39% from Université Côte d'Azur and Technical University of Košice, respectively. 29.02% are students of social sciences (political sciences, law, economics, education sciences, geography, etc.). 65.67% of teachers have more than 10 years of teaching experience. 53.92% belong to the University of Genoa. 24.92% teach

technical sciences (engineering, medical sciences, design, etc.), 18.34% social sciences and 14.42% natural sciences (biology, chemistry, physics, astronomy, etc.).

Only 4.65% of learners are completely confident with their level of digital soft skills. 14.43% are moderately confident. 45.54% and 44.77% value digital communication and digital collaboration respectively as very important skills for their future. Problem-solving is thus rated by 49.29%. For 8.07%, 6.73% and 6.16% digital citizenship, digital skills for sustainable development and digital influence are not very relevant. 76.48% rate problem-solving as important or very important for their learning and education. 74.01% think so with digital communication; 71.81% and 70.47% with the skills of digital collaboration and critical thinking and analytical thinking in the digital space respectively. 20.23% see digital citizenship as unimportant or not important at all. It is striking that 12% value digital literacy in this way. Digital literacy is little or not covered at all in academic programs, according to 28.57%. 32.82% do not know if their universities offer specific courses on digital competences.

33.39% of educators are moderately confident with digitally-enhanced teaching and learning; 14.42% are confident. More than 40% of teachers rate these skills as very relevant for their role: digital literacy (48.92%), digital communication (43.78%), creativity (41.08%), critical and analytical thinking (40.81%) and problem-solving (40.27%). 8.13% and 7.03% see digital citizenship and digital identity as unimportant respectively. See more [here](#).

## Collection of preliminary feedback, implementation of recommendations

When developing the Digital Soft Skills framework, the authors identified three broader competences, considered as necessary to succeed in any modern education setting. These competences are: Flexible Thinking in Learning, Reflective practice, Intercultural Empathy.

The flexibility and adaptability were also cited as the main examples of essential competences in the context of collaboration and teamwork in the 2009's OECD report on 21st century skills and competences for new millennium learners (OECD, 2009). In the context of education, flexible thinking is a key competency necessary for adapting to new learning environments, for transferring knowledge to new situations, and for understanding and solving unfamiliar problems (Barak, Levenberg, 2016). People often view the world as made up of orderly, predictable, and well-structured events and when presented with an authentic and complex problem, they might find it difficult to solve. Flexible thinkers, on the other hand, are able to think about things in a different way, they are able to come up with several solutions to a problem, then evaluate these different solutions and select the best response. As such, they are open to new experiences, to process new information and explore new environments easily, therefore are more likely to accept and adopt new technologies (Barak, Levenberg, 2016). Flexible thinking in learning can be understood as an acceptance of new or changing technologies, as an open-mindedness to others' ideas or adapting to (sudden) changes in learning situations (D2S survey, 2022).

Reflective practices are methods and techniques that help individuals and groups reflect and analyze their experiences and actions in order to engage in a process of continuous learning and to improve yourself (Shatz, 2023). Reflective practice can be described as an ability to identify, recognise and articulate one's acting and those of others. It is also an ability to assess their impact on one's own decisions and actions and their consequences, ability to learn from one's own reflections, using digital tools to support reflection (e.g. digital storytelling, ePortfolios) (D2S survey, 2022). Reflective practice is based on deepening one's understanding of self, the other and situations, focusing on cognitive, emotional and behavioral aspects and connecting between past, present and future (Karnielli - Miller, 2020). It involves thinking about how you do things, and trying to understand why you do what you do, and what you can do better. In other words, reflective practice is 'learning through and from experience towards gaining new insights of self and practice' (Finlay, 2008).

To communicate effectively and smoothly in the e-environment, everyone should cross the road from intercultural awareness to intercultural empathy. What is considered as appropriate in one culture is likely to be inappropriate in another, and therefore, misunderstandings arise when people communicate. Misinterpretations occur primarily when we are not aware of our own behavioural rules and project them onto others. However, the mere realization of cultural awareness should not be sufficient. Therefore, the ability to be culturally empathic is of great significance in many ways. The empathy in learning and intercultural communication is what we call intercultural empathy. It means placing himself into the other country's cultural background and being able to effectively communicate his understanding of that world (Zhu, 2011). Intercultural empathy can be defined as being aware and open to others' perceptions and viewpoints. It is an ability to understand your identity and those you interact with, acknowledge and embrace diversity and a global mindset (D2S survey, 2022). To achieve this goal, one needs to be open to communication, to differences in the ways people of different cultures communicate and also take active interest in

the culture and norms of other people. The more we know about a certain culture, the better the chances for effective communication (Zhu, 2011).

In the D2S Survey the respondents were asked to rate the relevance of these three competences for their role as a teacher on a scale of 1 to 5 (1: Not relevant at all; 5: Very relevant).



Figure 3. D2S Educators Survey, Source: D2S@Ulysses project

### Creation of the D2S courses for learners and educators

The aim of the D2S courses is to assist students and educators to improve their digital skills and stay competitive in today's job market. The courses are online and available in a Moodle learning environment. They are self-paced and free of charge for all Ulysses partners. In addition, the created MOOC course (Massive Open Online Course) is open to everyone, not only Ulysses partners. MOOCs refer to open online courses offered free-of-charge to anyone from anywhere in the world (Cornier & Siemens, 2010). The base for the D2S courses for educators and students were the two developed D2S frameworks, one for educators and one for students. There were four competence areas in the both frameworks: Developing me, Engaging with others, Acting now, and Creating the future, which were also used as names of the four courses. The frameworks also include cross-cutting competences: reflective practice/ intercultural empathy/ flexibility in learning, which was decided to be the topic for the fifth course. An additional course called MOOC was needed to serve as an introduction to all other courses. Totally, 12 online courses were created, six for educators and six for students. Each partner was responsible for one course for educators and one course for students. At Haaga-Helia university, students were actively involved in the project. Students studying in the course "Managing service interaction" together with their two teachers participated in the creation of two courses. The students interviewed other students and educators about digital well-being. As an outcome, based on the findings, they designed guideline booklets for students and educators of the best practices promoting digital well-being in an online course. They were allowed to use any suitable form, which they thought would suit students and educators. They were encouraged to use colors, be creative, and make it fun. Three individual or group works were chosen to be a part of the developing me courses.

The process started by creating course syllabi to ensure transparency and consistency among courses and to avoid repetition between the courses. The syllabus template included four columns to be filled: 1) course overview, 2) learning objectives, 3) topics covered, and 4) course outline. Overlapping and consistency checks were made by the end of January 2022. The project's pedagogical experts defined the types of learning material to be developed (H5P, audio) and the functionalities of the content to ensure high quality of the courses. The content was created and uploaded to the Moodle platform by mid-June for the first pilot. The pilots were organized from June to September 2022, when each course had at least three either student or trainer pilots. In total, there were 32 student participants and 20 educator participants.

Feedback from the pilot testers was collected using a questionnaire that included six questions. Questions were aimed to find out whether the testers (i.e. learners / educators) enjoyed the D2S course and whether and why they would recommend this course to other learners or educators. The students were also asked to evaluate the relevance of the content, proposed activities, level of difficulty, visuals and form, the structure and the use of the Moodle platform. In the end they were asked to suggest some modifications or improvements to the course. Simultaneously with the piloting, a peer assessment of the courses was also organized, whereby one of the partners assessed the other partner's two courses and made suggestions for improvements. The pilot feedback through the questionnaires and peer assessment results varied depending on the course. Improvement needs were typically related to increasing diversity of the content, and engagement, but also related to clarity and language of the courses. Pilots appreciated the courses

and considered the content to be relevant. Based on the feedback received, each partner started to improve the courses they were responsible for, and new versions of the courses were completed at the end of October. The second pilot was organized at the end of 2022. In total, there were 20 participants-learners and 11 participants-educators. The participants answered the questionnaire this time as well, and with the feedback received, the developers had the opportunity to further enhance the courses to meet the expectations of participants. The courses were launched on January 16, 2023, and the goal is that at least 30 students or educators from each partner university will participate in the courses before the project ends at the end of February 2023. Successful participants of the courses will be awarded with digital badges described in the following chapter.

## Usefulness of digital badges for increasing motivation in online courses

The Digital Soft Skills project recognizes and validates digital soft skills acquired through Open Badges. Open digital badges are a key component in a changing systems of education and credentialing (Willis et al., 2016). Micro-credentials and digital badges are growing in popularity in higher education institutions, industry and community organizations (Aruldason & Edwards, 2022). Digital badges are evidence of learning outcomes, as well as skills, and can be “stacked” together in different ways to enable flexible learning pathways and support lifelong credentialing of learning. In a digital society we can learn anywhere and anytime and digital badges hold a key to enabling transparent, information-rich credentialing of this learning (Lockley et al., 2016).

The use of badges for the accreditation of competences is being implemented in recent training processes with the aim of generating student engagement with the training process, due to the rewards obtained (Lu, Xie & Chen, 2022). Several studies have already shown the usefulness of digital open badges as a means of accreditation for training processes, in which visible recognition is offered in the form of symbols or icons and metadata that certify and validate evidence of learning and acquisition of competences (Gibson et al, 2015; Shield & Chugh, 2017). These are rewards that generate motivation and engagement in students, especially in higher education (Abramovich, 2016). The use of badges as a motivational asset can contribute to a more sustained engagement of students throughout the duration of the training action and to a greater ratio of completion of MOOCs (Araujo et al., 2020). Badges can be a stimulus for the completion of a MOOC course (Kopp & Ebner, 2017). According to Buchem & Borrás-Gené (2020), on the one hand, Open Badges may be an important contributor to motivation to learn in MOOCs and complete them and, by other, a proper description of skills in Open Badges has the greatest predictive value for motivation.

Students can have fun gaining badges that further target their intrinsic motivational potential alongside the more controlled and formal role of representing a credential (Cross et al., 2014). In fact badges are intrinsically related to the gamification methodology, one that implies the use of game mechanics in environments that are not eminently idle. In gamified online courses badges earned, along with time invested, are a reliable measure of participation in the learning experience (Imran, 2019). Ortega-Arranz et al. (2019) found that students have a positive behavior towards earning badges at gamified massive and open learning contexts and that behavioral engagement significantly correlates with their behavior towards earning badges.

Specifically, the D2S team has created several digital badges and a passport to certify the acquisition of digital soft skills by educators and students. Participants can obtain a badge per D2S course. In total, ten badges are associated with the D2S@Ulyseus courses. The badges share the same design (size, shape and color) as digital visual icons, except that each of them includes the title of a course (see Figure 4). The metadata of each badge specifies, in addition to other information, the achieved competencies. The participant will be invited to log into the Open Badge Factory platform and will then be able to download the badge, share it with others and on social networks. Once the Open Badges of all courses have been validated by a participant, Ulyseus Digital Soft Skills Passport will certify all developed skills and reinforce their visibility. The passport image differs from the badges in its color and size. The badges are endorsed by Ulyseus partners, as well as our associate partners. See more [here](#).



Figure 4. D2S Digital Badges, Source: D2S@Ulyseus project



## Conclusions and implications for practice

The co-authors of this paper and D2S project team identified the knowledge gap in digital soft skills via a pan-European survey performed in six countries. As only 4.65% of respondents - learners and 14.42% of respondents - educators were fully confident with their digital soft skills, the project team suggested digital soft skills courses for both groups. The courses are tailor made according to the needs of respondents. The development of the courses was based on relevant and recent theory in combination with practical experience and background of project members.

The design of the courses follows a modular approach which enables learners to choose the content according to his or her knowledge gap and in a self-paced manner. The modules in each course follow the same structure and didactic learning path. This user-friendly design helps learners to navigate easily within and between the different courses. Moreover, modularity enables teachers to integrate the courses or even parts of it into their teaching, i.e. as an optional add-on resource or as a basis for critical reflection. In future it is possible to implement relatively easily and flexibly further applications to different areas of life, study programmes, etc. The courses are based on an interdisciplinary and international approach. Two rounds of pilot testing is in line with the quality assurance of the course.

Application of D2S digital badges for successful participants should enhance the attractiveness of the courses and their international recognition. The badges are endorsed by Ulyseus partners as an important institutional commitment to recognition. We are working so that most, if not all, of our associate partners endorse our badges. D2S digital badges have already inspired some partners (e.g. Technical University of Kosice) to start to apply digital badges actively in their academic offerings, too.

The co-authors and D2S project team are aware of certain challenges and temporary limitations that could be solved in the future. The courses need regular maintenance and updates in terms of the content, methods, approaches. In the initial phase only the Ulyseus community (learners and educators) has accessed the courses, however in the short term at least introductory parts of the courses under the form of MOOCs will be open to wider public.

Strong motivation to maintain the Ulyseus European University Alliance in the long term and to fortify its position among European universities will guarantee sustainability, relevance and international recognition of the courses as well as other project outcomes.

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