Creating Digital Awareness

Rafael Vidal Ferré, Jesús Alcober Segura, Cristina Cervelló-Pastor,
Mª Teresa Fernández Mateos, Eduard Garcia-Villegas, José M. Yúfera Gómez
Network Engineering Department
Universitat Politècnica de Catalunya (UPC)
Esteve Terradas, 7, 08860, Castelldefels.
rafael.vidal@entel.upc.edu, alcober@entel.upc.edu, cristina@entel.upc.edu,
m.teresa.fernandez@estudiantat.upc.edu, eduardg@entel.upc.edu, yufera@entel.upc.edu

As a result of the world's population being much more digitally connected, it is increasingly relevant to acquire an adequate level of digital awareness. For this reason, the objective of this work is to introduce the competence of digital awareness in higher education programs. Specifically, this work is focused on the deployment of such competence within the Degree in Network Engineering of the Castelldefels School of Telecommunications and Aerospace Engineering of the Universitat Politècnica de Catalunya. To do this, we have planned a project structured in four phases in which the tasks to be carried out by the different participants have been defined in detail. Thus, the roles involved are: project coordinator, academic content designers, support companies for this implementation, students, as well as the Degree Coordinator and the Deputy Director of Master's Studies and Head of Quality. This is the first initiative we plan to extend to other grades or levels of study in the future.

Keywords—**Digital awareness, Digital Identity, Digital Citizenship, Degree Competences.**

I. Introduction

Our lives have an increasingly accentuated digital component, with a very high technological dependence that has recently been increased by the COVID-19 pandemic. Thus, the telematics[1] channel is becoming more and more relevant to social life, work, leisure activities, virtual shopping, or administrative procedures. In this digital scenario, we do not always act appropriately due to the lack of knowledge or skills in some cases and to unconsciousness in others.

This digital society requires that the general population, not only Information and communications technologies (ICT) professionals, have digital skills. Spain's Digital Agenda 2025 [1] establishes digital capabilities as one of the ten priority axes, and the National Digital Competence Plan [2] seeks to respond to this challenge. This situation is what motivates the present proposal, which arises from the project "Citizen Digital Awareness" (brand "Click & Safe", https://clickandsafe.upc.edu/). This initiative aims to position the Degree in Network Engineering (Grado en Ingeniería Telemática, in Spanish), the Castelldefels School of Telecommunications and Aerospace Engineering (EETAC) and the UPC, as academic references in this field, carrying out teaching, research, innovation and dissemination of this subject. It should be noted that this proposal has the support of the UPC management board, as well as the dean of the EETAC and the Department of Network Engineering.

In this context, our proposal aims to introduce digital awareness as a transversal competence in the Degree in Network Engineering [3]. This competence seeks to train future engineers to gain awareness of the implications of using ICT. For example, in terms of privacy, students should be aware of the consequences of using one solution or another to solve problems that arise during their professional life and apply this awareness in their processes, thus becoming social referents of digital awareness. Furthermore, by creating a transversal competence, we claim to implement it in other degrees of our university, whether or not they are related to ICT.

Currently, this competence is neither part of the transversal competences recognized by the UPC [4] nor part of the specific set stemming from the degree [3]. If we look at the rest of the Spanish Polytechnic universities, the situation is not very different. To the best of our knowledge, only the UPM has a transversal competence related to ICTs, but it is focused on acquiring technical knowledge and skills and following good practices [5]. This approach to what is known as digital competence (or skill) is predominant in the academic world [6]. We

---

[1]Note that the term "telematics" refers to the broader concept stemming from the integration of computer science and communications, as used in France and Spain, and is not limited to the communications of a vehicular system.

have also found it in the curriculum of our future students, which is defined in [8] and [9] for compulsory secondary studies (in Spanish Enseñanza Secundaria Obligatoria, ESO) and high school, respectively. However, if we look at the European Digital Competence Framework for citizens (DigComp) [2], used as a reference in the previously mentioned National Digital Competence Plan, we find that it introduces some competences dimensions aligned with our proposal. For example, related to the environmental impact of digital technologies and their use or digital technologies for social well-being and social inclusion.

Therefore, our contribution is the definition of this new competence, as a result of the UPC's "Citizen Digital Awareness" initiative.

Its introduction into the Network Engineering curriculum is not a coincidence. Several contents associated with this competence, which are already being taught in different subjects, have been detected. The aim is to give a structure to these contents, which naturally allows a global view of the competence and work on it systematically. To this end, a series of teaching materials will be developed, which will be integrated into the subjects whose concepts related to the competence are already being worked on. In addition, new possible contents related to this competence will be identified, determining the subjects in which they could be taught.

The realization of this initiative will open new lines of future work (see Section IV). From the EETAC's point of view, once the materials developed during the first-generation of the degree studies have been applied, the possibility of introducing the perspective of digital awareness in the final degree projects is considered. In UPC's terms, the material is proposed to be used in other degrees inside the ICT area. In addition, we intend to give an international dimension to this project. In this sense, work is being done towards the participation in European projects aligned with this topic, with the aim to introduce digital awareness competence at all levels of education, whether compulsory or not.

The remainder of the document is structured as follows. In Section II, we provide the main definition and focus of the digital awareness term. Section III comprises background concepts on digital awareness, classifying them on different types. In Section IV we detail the proposal of our digital-awareness project. Finally, in Section V, we give a short conclusion of this project.

II. DIGITAL AWARENESS

Digital awareness relates to people's individual awareness of the opportunities and risks associated with the ICT and the sensible ways of using them. This term applies to different aspects: from being aware of one's online identity, digital footprint and data protection rights to healthy habits in the use of technology [10].

Since the 1990s, it was clear that information technologies would trigger an industrial revolution now called Industry 4.0, transforming both the economy and the society [11]. It is then when the concept of digital inclusion appeared to ensure that all individuals and disadvantaged groups have access to, and skills to use ICTs, and are therefore able to participate in and benefit from today's growing knowledge and information society [12]. From that moment on, solutions were formulated in different fields such as public policy, technology design, finance, and management, which would allow all connected citizens to benefit equitably as part of a global digital economy [13].

Digital awareness is thus understood as an evolution of digital inclusion which aims not only at empowering citizens in the use of technology, but also focuses on its proper use, minding the risks and following safe and sensible ways to use it. This term is gaining notoriety in the late years, as research on digital awareness in education has been led by the increase of internet usage by young people during the COVID-19 pandemic [14] [15]. Nonetheless, no formal definitions of the term have been given to this date. Hence, in the following, we elaborate on a definition based on the evolution and usage of the term in academic research as well as in public and private initiatives with a similar goal.

III. TYPES OF DIGITAL AWARENESS

Digital awareness connects several topics related to the safe and sensible use of technology. Those topics can be classified into the following types of digital awareness, as shown in Fig. 1. Nonetheless, the proposed taxonomy is subject to constant evolution as ICT's new challenges, risks and opportunities arise.
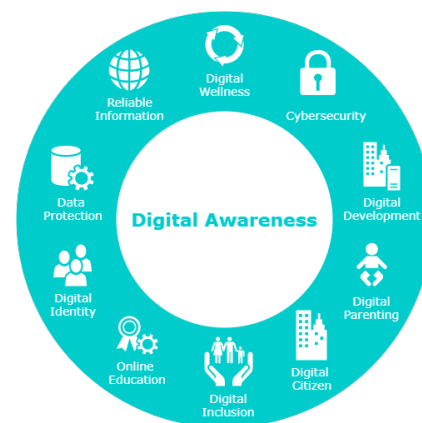

Fig. 1.   Types of Digital Awareness.

A. Digital Wellness

Digital wellness (also known as digital wellbeing) is the pursuit of an intentional and healthy relationship with technology in the workplace and personal life [16].

The main issues related to the unsensible use of technology include:

- **Eye strain**. Too much screen time can force the muscles involved in eye focus and cause eye strain. Also, when looking at digital screens, the eye does not blink so frequently and this leads to dry eyes and minor eye irritations [15].

- **Insomnia**. Especially among the youngest. 77% of teenagers surveyed reported sleep problems, including night waking and difficulties falling asleep. Long gaming sessions or frequent notifications received on the phone during the night can disrupt our sleep patterns [16].
- **Diminished attention span**. Having digital devices around, especially if notifications are turned on, affects our capacity to stay focused. Also, some attention-demanding apps such as social media applications, try to build a habit on the user to check the application constantly.
- **Cyberbullying**. A group of researchers found that teenagers who spent five hours or more online each day were 71% more likely to commit suicide than those online for just one hour a day. This is related to the phenomena of cyberbullying and cyberstalking, which is especially invasive since the abuse is received via devices that accompany the victims all day [17].

Digital wellness aims to tackle these issues and promote a healthy relationship with technology. The idea is not only to learn sensible ways to use technology, but also to become aware of its use as a tool to monitor or even improve your health.

B. Cybersecurity

Cybersecurity, also referred to as information security, is the practice of ensuring the integrity, confidentiality, and availability of information. It involves a set of tools, risk management approaches, technologies, training, and best practices designed to protect networks, devices, programs and data from attacks or unauthorized access [20].

Most of the cyberattacks usually involve social engineering, which seeks to manipulate individuals to obtain confidential information or induces users to download malicious software [21].

At the individual level, cybersecurity-related digital awareness holds a set of good practices such as:

- **Setting strong passwords**. Using strong passwords combining letters, numbers and special characters is key to prevent unwanted access to our accounts and personal information. The length of the password is also key and it is advisable to use a different password in each account and pay attention to anything that may hint an unwanted external access. Changing the passwords periodically is also a recommended practice.
- **Careful use of open Wi-Fi networks**. Wi-Fi connections in public places are prone to attacks, so it is advisable not to use them, especially those not implementing security features. Check the authenticity of the pages you visit while connected to an open Wi-Fi network.
- **Do not share personal information**. Being cautious about sharing any type of personal information online is a good practice, taking special attention to social media, the enterprises and individuals that contact us.

- **Check the identity**. It is important to check the officiality of corporate accounts and veracity of individual profiles online to avoid impersonation attacks of social engineering.

It is important to raise awareness on how to identify and prevent any harmful cybersecurity threats.

C. Reliable Information

Reliable information is the information extracted from official and cross-checked sources, which contrasts with the online phenomena of fake-news and misinformation. The ability to check the veracity of online information is key to counteract the increasing viral spread of fake-news in social media [22].

The spread of fake-news can even threaten the individual safety of people, often involving health issues or economic loss. It can also affect governments degrading democracy with the phenomenon of high political polarization and sensitivity to manipulation.

D. Digital Identity

Digital identity is the set of information that identifies a person online, and it is closely related to digital footprint as it is the trace of information that a person leaves after any online activity.

It is important to understand how our actions affect our digital identity and how other people, entities, and enterprises perceive us based on our digital footprint. This can potentially affect our daily lives in unexpected ways. For instance, more than 75% of employers actively research candidates online and, what is more, around 70% have decided not to hire a candidate based on what they've found in social media; hence, online activity can even affect a person's employability [21].

Digital awareness promotes the acknowledgement of one's digital identity and digital footprint. It helps to find ways to build a solid profile, minding that the image left online will have an effect on the future.

E. Online Education

Online education regarding digital awareness relates to making use of digital resources to promote life-long learning, self-learning, and access to quality education in remote areas or during exceptional conditions.

COVID-19 pandemic crisis stimulated an unprecedented advance of the resources for online education [23]. As a consequence, education institutions foresee a hybrid education model for the near future, in which traditional and online education coexist, and adapt their programs to the digital age.

Nonetheless, there are unofficial education academias online that offer non-valid certificates and often offer misleading information and scam their clients. It is then a part of digital awareness to know how to access and take part in quality online education.

F. Digital Parenting

Digital parenting describes parental efforts and practices for comprehending, supporting, and guiding children's activities in digital environments [25].

The advisable steps to pursue good digital parenting are [23]:

- **Conversation**. Have conversations with the children on the key aspects of digital awareness such as digital footprint, cyberbullying and digital wellness.
- **Parental controls**. Use parental controls in applications to restrict inappropriate content for children and limit screen hours.
- **Becoming a role model**. Manifest digital aware habits of cybersecurity and digital wellness.
- **Celebrate**. Incentivize the good behaviours online and keep active conversation about the opportunities and advantages of the digital responsible life.

Even though academic education plays a big role in this regard, with different programmes of digital inclusion and awareness, parents should also be educated on the matter and serve as role models for their children on how to use technology safely.

G. Digital Inclusion

Digital inclusion refers to the activities necessary to ensure that all individuals and communities, including the most disadvantaged, have access to and use of Information and ICTs [27].

It must be a shared responsibility for all societies and governments to work towards digital inclusion. Both families and educational institutions must guide the youngest, the elderly and the disabled in their learning process to be digital citizens.

H. Digital Development

Digital development is the development and economic growth that comes from the use of new technologies. The ICT sector generates value and has become a new industrial revolution, Industry 4.0.

This type of digital awareness is needed so the digital transformations can be understood and supported by society. It involves acknowledging the impact of such digital transformation on all business sectors, regulating the transition, and enabling a smooth coexistence [29].

I. Data Protection

Data protection, also known as information privacy, is related to the proper handling of personal and confidential data that online entities must follow to protect it from being wrongfully shared or filtered.

It is necessary, in order to be digitally aware, to understand data protection rights and carefully read the terms and conditions agreement of every online service. Sharing one's personal data to third parties can affect online privacy and digital footprint and can even be used to manipulate or mislead users in the future.

Additionally, personal information must be used in a way that ensures the appropriate security, including protection against unlawful or unauthorised processing, access, loss, destruction or damage [30].

J. Digital Citizenship

A digital citizen is a person using ICT in order to engage in society, politics, and government. It is part of digital awareness to realize how information technologies provide a medium for easier communication with governments and a way to pursue activism to achieve a digital society that warranties safety [31].

This concept involves a full integration of digital technologies in society and has, as a political priority, the regulation of new technologies so that no legal voids are generated and new economic models do not oppress or abuse the existing ones.

This relationship between the concepts of digital citizenship and digital awareness sometimes allows the use of both terms interchangeably.

IV. DETAILED PROPOSAL

As it was explained in the introductory section, the aim of the proposal focuses on the inclusion of the digital awareness competence in the bachelor's degree in Network Engineering of the EETAC.

Similarly to what we did with the rest of the competences of these degree studies, the starting point will be to define clearly and accurately the digital awareness competence, listing the different associated concepts, and mapping it in the most appropriate subjects of the degree.

The introduction of these concepts comprises two parts: (i) the creation of contents, whether theoretical or practical, and (ii) the definition of associated evaluation activities that allow assessing their level of achievement through structured grading rubrics with different criteria, levels of performance and scores.

Figure 2 shows the details of the tasks to be performed in the project, which has been structured in four phases.

The focus will be the generation of contents and assessment activities that the student can use autonomously, usually outside the classroom, but under the supervision of the corresponding faculty. This is the reason why we opt for audiovisual content, the so-called educational pills, and self-assessment tasks that can be performed on the Moodle platform.

To facilitate the incorporation of contents and evaluation activities and the subsequent use in specific subjects, the tool of the professor's "Courses Luggage" will be used. By default, we will opt for creating H5P-based interactive video allowing us to integrate audiovisual content along with its evaluation in the form of an interactive activity. All of these contents and activities will be validated and improved, if needed, according to the results of surveys conducted using Google Forms to collect feedback from the students.

There are different types of participants or roles in the project as it is shown in Fig. 3. First, there is a project coordinator. On the other hand, a working team has been defined, made up of faculty. These are academic designers of the contents. In addition, the faculty who teach the
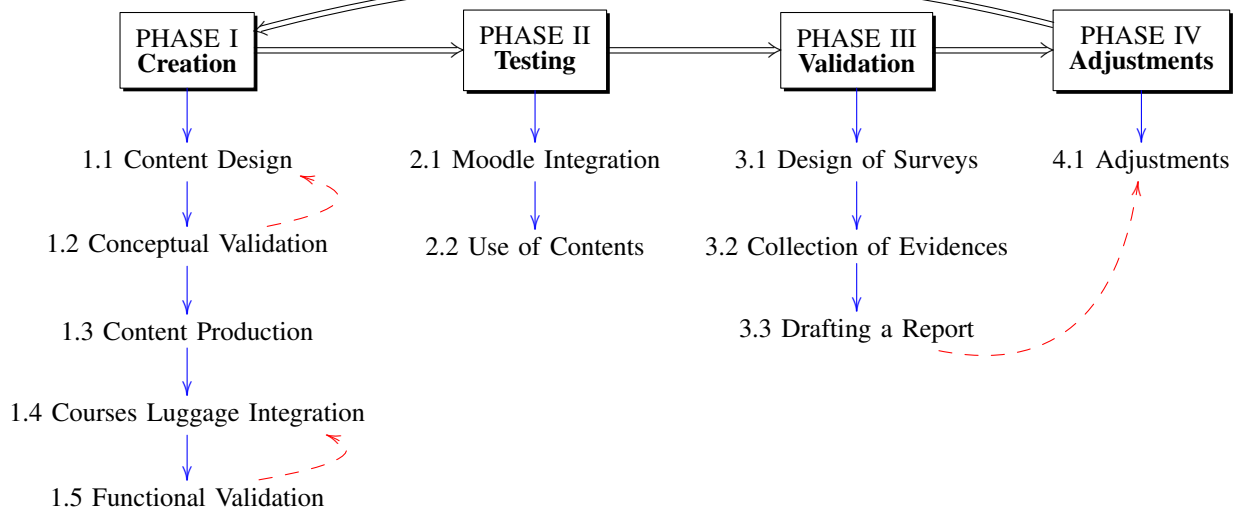
Fig. 2. Development of the project structured in four phases and several tasks. Read lines are interactions betwen them.

subjects in which the new digital awareness competence will be introduced, must also take part. Moreover, the degree coordinator and the deputy director of quality of the school also participate in the validation phase. Of course, students also participate by testing the content and answering surveys. Finally, both an external company specialized in communication strategy and UPC's production services participate in the design and production of audiovisual contents.

1) PHASE I: Creation

In the first phase, comprising several tasks, we will create different contents and the related assessment activities.

- Task 1.1. Content design: carried out by the work team in collaboration with the external company. As a result, we will obtain the video scripts and other necessary material, e.g. graphic resources, to carry out the production of the content and the definition of the associated assessment activity.
- Task 1.2. Conceptual validation: before its production, the contents and evaluation activities will be validated by the coordinator of the proposal. After production, it will also be validated by the coordinator, the academics who designed them, and by the aforementioned company. If necessary, it may involve revising task 1.1.
- Task 1.3. Content production: carried out by the audiovisual production services of the UPC and with the advice of the external company. As a result, Moodle-compatible audiovisual content will be obtained.
- Task 1.4. Incorporation of the contents into Moodle: the academics who carried out the design will be responsible for introducing the content and for creating the associated self-assessment task using the professor's "Courses Luggage" tool in the Moodle. As a result, we will get H5P-based interactive audiovisual content integrated with its evaluation.
- Task 1.5. Functional validation: to ensure that the content can be displayed correctly and that the evaluation activity is consistent with the expected answers,

it will be tested at least by the academics who designed it and by the coordinator of the proposal. As a result, we will obtain the functional validation or a report of corrections to be made, which may involve revising task 1.4.

2) PHASE II: Testing

In the second phase, we will test the different contents and the assessment activities. It is divided into two tasks.

- Task 2.1. Integration in the Moodle course of the selected subject: this is a task carried out by the faculty of the subject associated with the content. As a result, the content and the associated assessment activity will be prepared to be used by students of a subject in their course at Moodle.
- Task 2.2. Use of the contents: the coordinator of the subject or the delegate will ask the students to make use of the contents that will remain available for a specific and limited period of time. As a result, we will get some positive or negative messages in the forum of the virtual campus and reports of activity and evaluation of Moddle.

3) PHASE III: Validation

In the third phase, we will test the different contents and the assessment activities. It is also divided into three tasks.

- Task 3.1. Design (or redesign) of surveys: task managed by the coordinator of the proposal, and with the validation of, at least, the coordinator of the degree and the deputy director of quality of the school. The result of this task will be a set of surveys for students and for the faculty.
- Task 3.2. Collection of evidences: surveys will be provided, through Google Forms, to the students and teachers involved in the design of the contents and the teaching of the subject. They will value the contents and, in the case of faculty, also the suitability of its evaluation.
- Task 3.3. Drafting a report: the coordinator of the proposal will write a report showing all the indicators

PHASE I — CREATION
- 1.1 Content Design
- 1.2 Conceptual Validation
- 1.3 Content Production
- 1.4 Luggage Integration
- 1.5 Functional Validation

PHASE II — TESTING
- 2.1 Moodle Integration
- 2.2 Use of Contents

PHASE III — VALIDATION
- 3.1 Design of Surveys
- 3.2 Collect. of Evidences
- 3.3 Drafting a Report

Participants

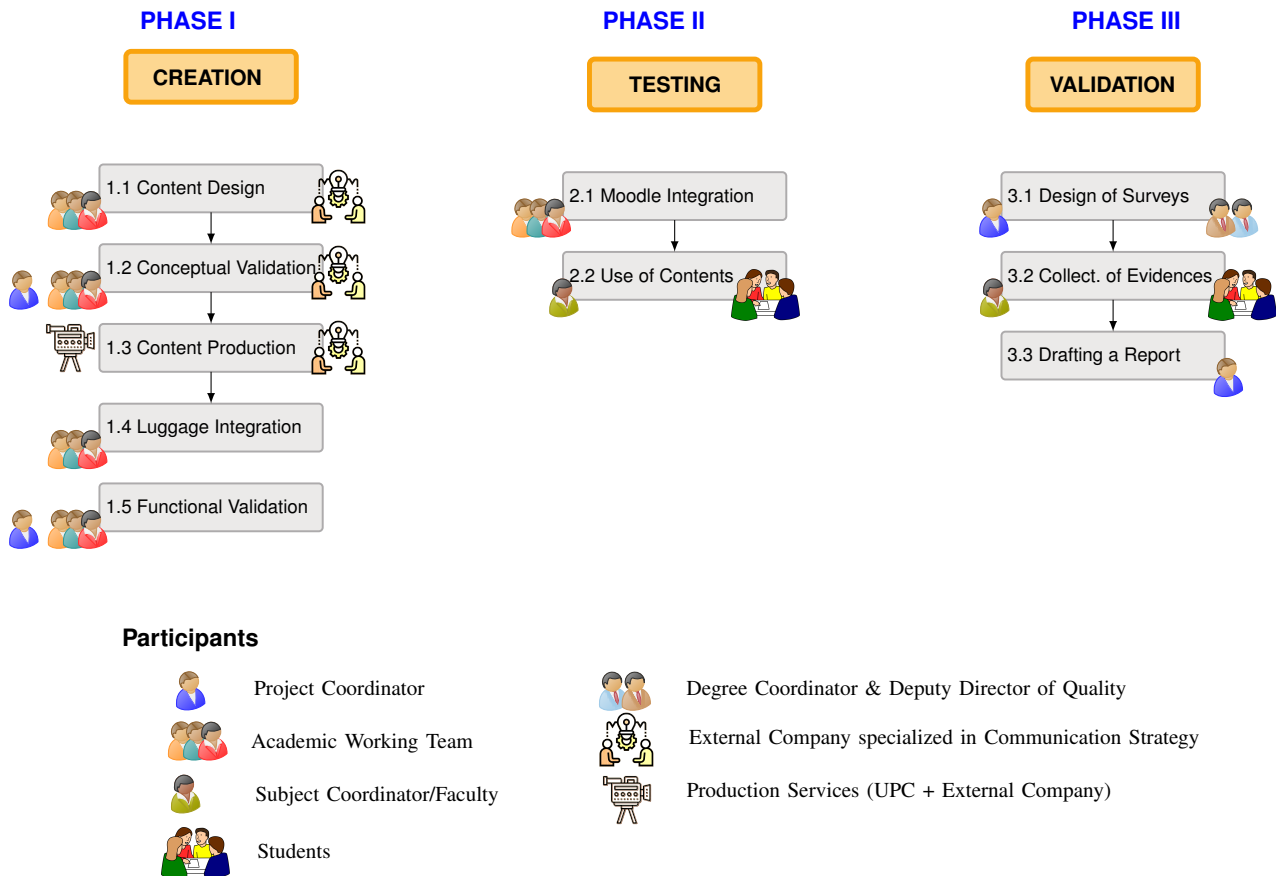|	
Project Coordinator	Degree Coordinator & Deputy Director of Quality
Academic Working Team	External Company specialized in Communication Strategy
Subject Coordinator/Faculty	Production Services (UPC + External Company)
Students	

Fig. 3. Participants of the project.

collected, both in Moodle (participation in activities, evaluation results) in the form of metrics (e.g., % of participation or % of content achievement) and in the surveys. The report includes an analysis of the results, proposing, where appropriate, improvement actions and collecting feedback from the rest of the work team.

This process involves two iterations. In this way, the feedback received in the first iteration will be introduced in the second to improve the contents.

4) PHASE IV: Adjustments The fourth phase is used to adjust the contents and the assessment activities. As a result of the feedback of Task 3.3, the associated contents and assessment tasks will be adjusted, if necessary, and re-entered in Moodle.

On the other hand, in this last task, future proposals will be initiated that will take advantage of the results of this project. For example, we propose to introduce the perspective of digital awareness in the final degree projects, use it in other ICT degrees of the UPC, or participate in European projects in this field (for example with the Unite! alliance), and introduce digital awareness competence at all levels of education, whenever possible.

V. CONCLUSIONS

The objective of this work is to present an initiative related to the introduction of the digital awareness competence in the Network Engineering Degree of the Castellde-fels School of Telecommunications and Aerospace Engineering (EETAC) of the UPC.

The work team is basically composed of faculty that teach in a Degree in Network Engineering. This group is based on the experience of the faculty participating in the coordination of subjects and the preparation of teaching material, apart from extensive experience in university academic management as department directors, heads of studies, department or school secretary, or section heads. The group also has experience in teaching innovation and outreach projects and in the development of the map of competencies in the EETAC degrees.

The project has been structured in four phases and several tasks planned in nine months, during which contents will be designed, developed, integrated into Moodle, and tested, evaluation included.

There are different types of participants or roles in the project, including the project coordinator, a faculty work team who will design the contents, coordinators and professors of different subjects at which this competence will be introduced, and students. It is important to highlight the roles of the Degree Coordinator and the Deputy Director of Master's Studies and Head of Quality, who will provide the project with a global perspective, both in terms of content and structure, style, and form.

In the first experiments carried out, great interest from the students has been observed, so that we expect to obtain important and remarkable results from this project.

Initially, this competence is planned to be added to undergraduate studies, but as future work, we propose to extend its application to other ICT degrees, as well as in other higher and lower study levels.

REFERENCES

[1] España Digital 2025. Portal Ministerio de Asuntos Económicos y Transformación Digital link [last accessed on Sep. 28th 2021].

[2] Plan Nacional de Competencias Digitales. Portal Ministerio de Asuntos Económicos y Transformación Digital link [last accessed on Sep. 28th 2021].

[3] Bachelor's degree in Network Engineering. EETAC-UPC, https://eetac.upc.edu/en/study/bachelors-deegrees/telematics-engineering-1 [last accessed on June 24th 2021].

[4] Transversal competences, UPC.https://www.upc.edu/sga/es/TitulosySET/CompetenciasTransversales [last accessed on June 24th 2021].

[5] Competencias Genéricas. Recursos de apoyo al profesorado. Uso de las TIC. https://innovacioneducativa.upm.es/competencias-genericas/formacion-evaluacion/uso-tic [last accessed on September 28th 2021].

[6] A. Sánchez-Caballé, M. Gisbert-Cervera, F.M. Esteve-Mon, (2020). "The digital competence of university students: a systematic literature review". https://raco.cat/index.php/Aloma/article/view/372039/465595 [last accessed on September 28th 2021

[7] Basic competences in the digital field. Identification and deployment in primary education. Generalitat de Catalunya, Departament d'Ensenyament, Nov. 2013. http://educacio.gencat.cat/web/.content/home/departament/publicacions/colleccions/competencies-basiques/primaria/ambit-digital.pdf [last accessed on June 24th 2021].

[8] Core competences in the digital field. Identification and implementation in compulsory secondary education. Generalitat de Catalunya, Departament d'Ensenyament, Nov. 2015. http://educacio.gencat.cat/web/.content/home/departament/publicacions/colleccions/competencies-basiques/eso/ambit-digital-angles.pdf [last accessed on June 24th 2021].

[9] High school curriculum. Generalitat de Catalunya, Departament d'Ensenyament. http://xtec.gencat.cat/web/.content/alfresco/d/d/workspace/SpacesStore/0028/f2989dc7-8a2c-4b2f-86e8-4d5929f43fd7/PUBL-curriculum_batxillerat.pdf [last accessed on June 24th 2021].

[10] International Telecommunication Union. "Overview of ITU's History (8)" [last accessed on June 24th 2021].

[11] R. Bukht, R. Heeks, "Defining, Conceptualising and Measuring the Digital Economy," *SSRN Electronic Journal*, 2017.

[12] Communications Trust, 2020. "Digital Inclusion definition"[last accessed on June 24th 2021].

[13] Citrix Systems, Inc. "What is digital wellness?" [last accessed on June 24th 2021].

[14] I. Corradini, E. Nardelli, "Developing Digital Awareness at School: A Fundamental Step for Cybersecurity Education". In: Corradini I., Nardelli E., Ahram T. (eds) Advances in Human Factors in Cybersecurity (AHFE). *Advances in Intelligent Systems and Computing,* vol 1219, 2020.

[15] J.S. Chibbaro, L. Ricks, B. Lanier, "Digital Awareness: A Model for School Counselors," *Journal of school counseling*, 17, 2019.

[16] BetterTime, Co, 2018. "What is Digital Wellness and Why Does It Matter?" [last accessed on June 24th 2021].

[17] UAB Medicine Marketing Communications. "Eye Health in the Digital Age: Does Too Much Screen Time Hurt Your Vision?" [last accessed on June 24th 2021].

[18] C. Knight. "Screen Time and Insomnia", Feb. 1st, 2021 [last accessed on June 24th 2021].

[19] J. Byars, E. Graybill, Q. Wellons and L. Harper, "Monitoring Social Media and Technology Use to Prevent Youth Suicide and School Violence," *Contemp School Psychol*, vol. 24, pp. 318–326, 2020.

[20] J. Kaur and K.R. Ramkumar, "The recent trends in cyber security: A review," *Journal of King Saud University - Computer and Information Sciences*, pp. 1–16, 2021. Available at: link [last accessed on June 24th 2021].

[21] Social Engineering Statistics, 2021 Cyber Security Statistics. The Ultimate List Of Stats, Data & Trends, PurpleSec LLC. https://purplesec.us/resources/cyber-security-statistics/ [last accessed on June 24th 2021].

[22] Austin Community College District, "What Makes Information Reliable?" [last accessed on June 24th 2021].

[23] L. Benedetto and M. Ingrassia, "Digital Parenting: Raising and Protecting Children in Media World," *IntechOpen chapter book*, pp. 1–21, 2020. Available at: link [last accessed on June 24th 2021].

[24] M. Fertik (April 03, 2012). "Your Future Employer Is Watching You Online. You Should Be, Too," https://hbr.org/2012/04/your-future-employer-is-watchi. Harvard Business Review. [last accessed on Sep. 29th 2021].

[25] National Digital Inclusion Alliance. Definitions, "Digital Inclusion" [last accessed on June 24th 2021].

[26] "The 7 secrets of great digital parenting". https://www.familyzone.com/anz/families/blog/seven-secrets-of-great-digital-parenting. The Family Online Safety Institute [last accessed on Sep 29th 2021].

[27] UNESCO, "Distance learning solutions" [last accessed on June 24th 2021].

[28] A. Seifert, PhD, S. R. Cotten, PhD, B. Xie, PhD, "A Double Burden of Exclusion? Digital and Social Exclusion of Older Adults in Times of COVID-19," *The Journals of Gerontology: Series B*, vol. 76, no. 3, pp. e99-e103, March 2021.

[29] Citrix Systems, Inc., "What is Digital Transformation?" [last accessed on June 24th 2021].

[30] GOV.UK,, "Data protection" [last accessed on June 24th 2021].

[31] M.S. Ribble, G.D. Bailey and T.W. Ross, "Digital Citizenship: Addressing Appropriate Technology Behavior," *Learning and Leading with Technology*, vol. 32, no. 1, pp. 6–11, 2004.