THE DIGICOMPASS E-LEARNING PLATFORM: AN INCLUSIVE E-LEARNING PLATFORM BASED ON FLIPPED LEARNING METHODOLOGY

A. Yeratziotis[1], C. Tsouris[1], C. Mettouris[1], H. Makl[2], G.A. Papadopoulos[1]

[1]University of Cyprus (CYPRUS)
[2]Europäische Bildungsinitiative (AUSTRIA)

Abstract

The DigiComPass course will be administered via the Moodle Learning Management System (LMS), making it ideal for competency-based training and adaptable in its flexibility for Flipped Learning (FL) 3.0. The course itself is divided into five modules, addressing the needs of adult learners across a wide age range, from 18 to seniors aged 65 and over: Information and Data Literacy, Communication and Collaboration, Digital Content Creation, Safety, and Problem-Solving.

Each module is broken down into Units, and further into Lessons. To ensure a comprehensive understanding and application of each lesson, the FL approach was considered, and the developed concept of the "Flipped Instructional Design", using two different learning spaces: The Individual Learning Space (distance learning), where the learners can digest and reflect upon the information at their own pace, and Group Learning Space (collaborative On-site training), where they can practise and enhance their understanding through group activities and interactions.

The Individual Learning Space is supported and implemented in the Moodle LMS. With the DigiComPass course targeting a wide range of adult learners, Moodle LMS carries multiple benefits in our pursue for inclusion. Designing learning content in diverse multimedia formats, offering community support and multimedia-based microlearning, as well as a range of assessment tools contributes to inclusion. In addition to designing accessible e-learning content, Moodle LMS also aims for accessibility, promoting two of FL's main building blocks, namely inclusion and diversity. The DigiComPass course also has an accreditation system, i.e. open badges, which are issued upon successful completion of each module, supporting a gamification element to engage learners, while an online certificate will be awarded upon collection of all badges.

The paper presents the DigiComPass e-learning platform, including its architecture, instructional design, front-end and accreditation system.

Keywords: Flipped Learning 3.0, e-learning Platform, Accessibility, Inclusion, Accreditation.

1 INTRODUCTION

DigiComPass is a recognition model developed for the purposes of providing an assessment platform for adult courses that integrate a strong digital skills component. The model comprises of a pedagogical framework based on Flipped Learning 3.0, supporting the blended learning delivery of course content, and an e-learning platform that hosts course creation and delivery. Currently, the model is implemented in the DigiComPass training course on Digital Competencies. The 5-module course targets instructors and trainers in adult education and also adult learners (18 to 65 years of age and beyond). The former are expected to have the knowledge and skills that will allow them to motivate and actively engage diverse learners, while the latter are needs-driven and self-directed. As such, they are expected to benefit from flexibility and the use of real-life materials that will render the entire process more meaningful.

2 FLIPPED LEARNING 3.0

Flipped Learning 3.0 is an innovative approach to adult education, representing a departure from the traditional classroom model. In this approach, learners are encouraged to take ownership of their learning by using technology and resources outside the classroom to gain knowledge and understanding of the topic [1, 2]. The instructors' role in FL 3.0 is to act as facilitators, guiding and supporting learners in exploring and applying what they have learned. This includes creating an interactive and collaborative learning environment where learners can share their ideas, ask questions, and receive feedback from

their peers and instructors [3]. One of the main principles of FL 3.0 is the use of blended learning, where learners can access materials and resources both online and in the classroom. This allows for a more flexible and individual approach to learning, as learners can work at their own pace and on their own schedule [4]. Overall, FL 3.0 is an effective approach to adult learning, fostering learner engagement and understanding, while also providing trainers with the tools and strategies needed to effectively support their learners.

The asynchronous use of individual and group learning spaces (see below), implementation of Bloom's taxonomy in assigning appropriate content to those spaces and the incorporation of Backward design (where instructors first set intended outcomes, then assessment and lastly content) are all integral parts of flipped learning models.

3 THE DIGICOMPASS E-LEARNING PLATFORM

3.1 Platform architecture

Figure 1 depicts the DigiComPass e-learning platform architecture schema. The platform was designed using Moodle LMS as the basic platform. The individual learning space implements the DigiComPass course, consisting of the 5 Modules along with their Units (see also Figure 4). Each unit has access to content stored in the platform's database, such as videos, text, presentations, self-evaluations, infographics and interactive maps. In addition, the accreditation component is available for users to utilise after the completion of each module.

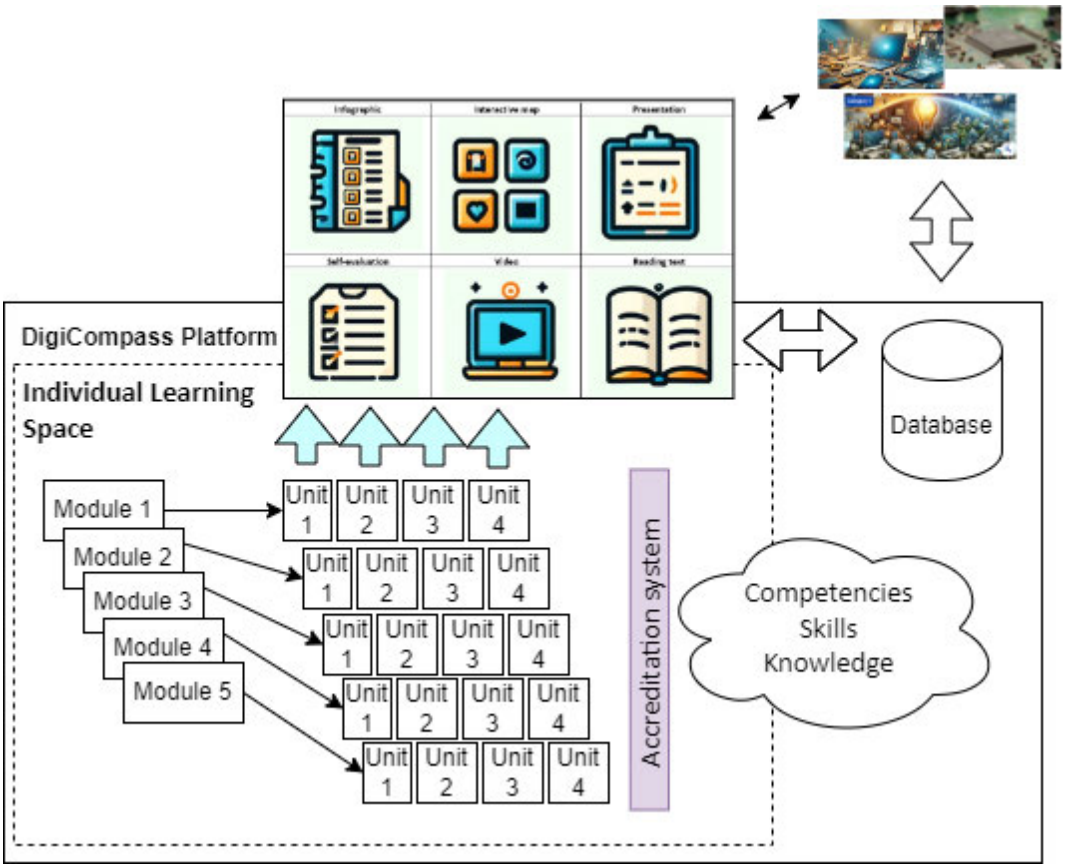

Figure 1. DigiComPass e-learning platform architecture

3.2 Instructional design

The DigiComPass course consists of 5 modules (Information and Data Literacy, Communication and Collaboration, Digital Content Creation, Safety, and Problem-Solving). Each module is broken down into Units; in turn, Units are broken down into Lessons. Two different learning spaces are employed, both central in flipped learning environments. The Individual Learning Space (distance learning) is where learners can digest and reflect upon the information at their own pace, independently and often outside

the classroom, ensuring the acquisition of foundational knowledge before learners enter the classroom. The Group Learning Space (collaborative On-site training) typically takes place in the classroom and is where active, collaborative learning occurs. This enables a dynamic process where learners can practise and enhance their understanding through group activities and interactions.

3.3 Front-end

In accordance with the aforementioned instructional design requirements (i.e. units, lessons, individual learning space), the modules for the DigiComPass course in Moodle have been designed to provide an intuitive and engaging experience for instructors and learners. Upon accessing the platform, either as a guest or by being provided with log-in details by the administrator (see Figure 2), learners can view the available courses.

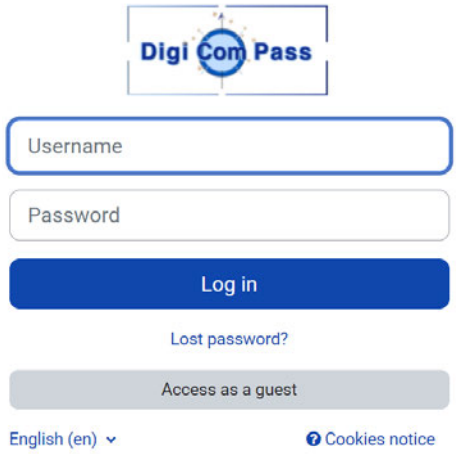

Figure 2. Log-in page.

The instructional design is consistent and standard for all five modules, ensuring that learners quickly become accustomed and efficient in its use. On the Home page of the e-learning platform, the five available modules of the course are presented. Using module 5 (Problem Solving) as the selected module from the home page (see Figure 3), the common simplistic structure shared across modules is presented in Figure 4. Module 5 specifically comprises four units. The General section can be used by the instructor to post announcements.

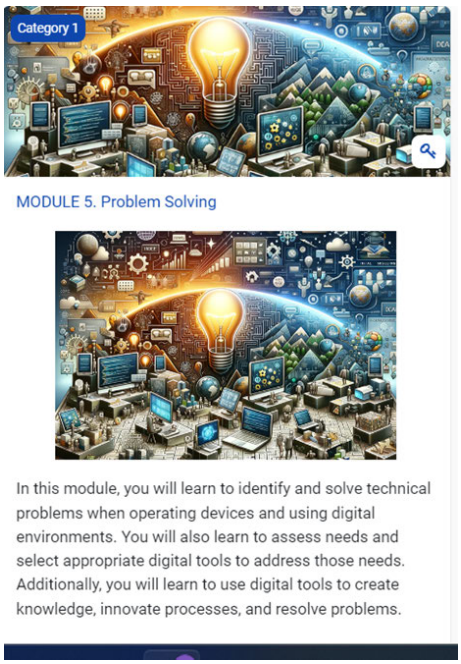

Figure 3. Description of module 5.

Figure 4. Structure of module 5.

When expanding a unit, an overall description is provided, and its respective lessons (with descriptions) are presented. Learners can also track their progress by marking each block item covered, with the Mark as done button, positioned in the top-right hand corner of the content item (see Figure 5).

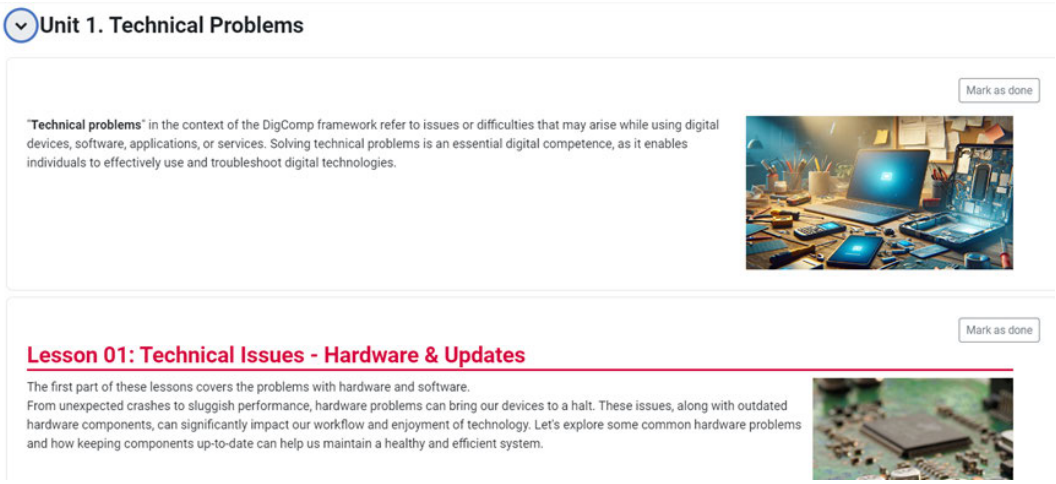

Figure 5. Unit and respective lessons descriptions and content.

A lesson can have different types of learning media content, each represented with its own icon, such as video and self-evaluation (see Figures 6 and 7). The aim is to accommodate the personal learning needs of learners that may excel in the use of different types of learning media content.

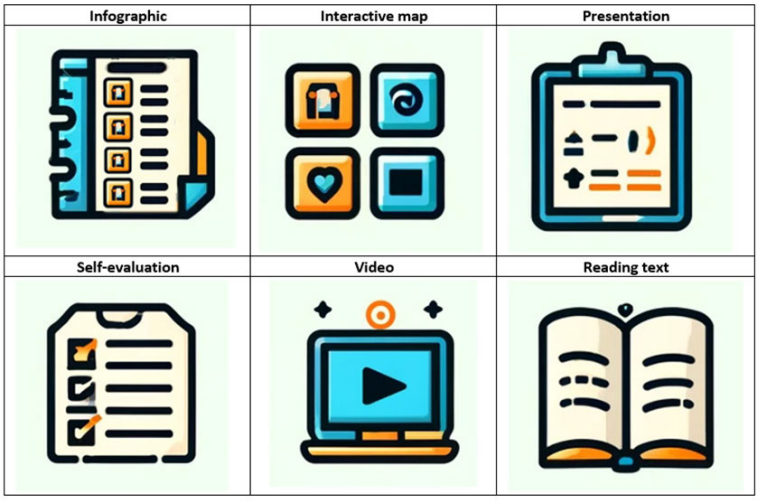

Figure 6. Different types of learning media content and their icons.

Within each lesson, there are learning content items and the five modules are offered in six languages: English, German, Italian, Spanish, Danish and Greek. By default, and upon selection, Moodle also offers not only the translated learning content created by the project itself but the entire user interface in the partners' languages . To summarise, the labelling system hierarchy adopted has the following sequential order: Module -> Unit -> Lesson -> learning content item -> language (See Figure 7).

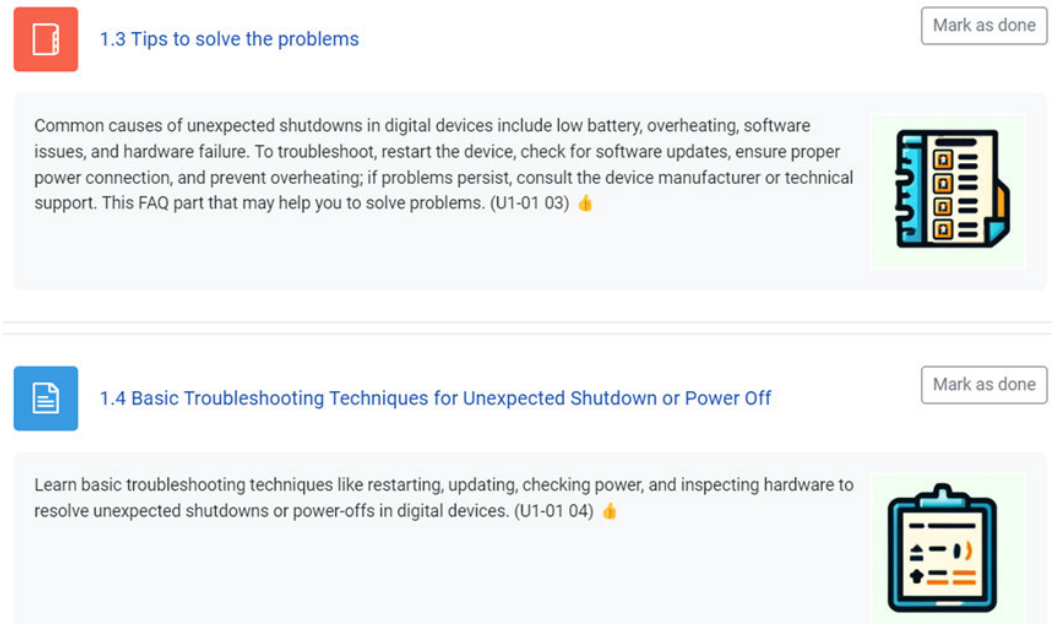

Figure 7. (U1-01 03) is an infographic learning media content and (U1-01 04) is a presentation learning media content

3.4 Accreditation system

The DigiComPass framework also acts as a quality enhancement framework for course creation, implementation, and evaluation and can be used in other training courses. More specifically, it systematically validates and acknowledges the competencies, skills and knowledge that learners acquire. By and large, such a framework employs various formative and summative assessment methods in both the individual and group space to assess, recognize and accredit learning outcomes. The framework makes use of an open, digital Badges system. Completing each Module in this course, leads to a badge. There are three success levels for learners to achieve in every Module, and badges can be issued in three colors, showing the success level:

1 Red = Pass (overall score of 0-30%)

2 Yellow = Pass with success (overall score of 31-60%)

3 Green = Pass with excellence (overall score of 61-100%)

To provide learners with the functionality to obtain a badge for completing a single module and a certificate for successfully completing all five available modules, specific conditions need to be set-up on the e-learning platform to accommodate each case respectively. According to success level (1, 2 or 3), a learner receives the respective badge for that module with the appropriate color (red, yellow or green). This is based on the conditions set on the minimum applicable grade for each module, as mentioned previously. As depicted in Figure 8, once the system validates module completion, it determines the associated badge color to be awarded, based on success level (overall score).

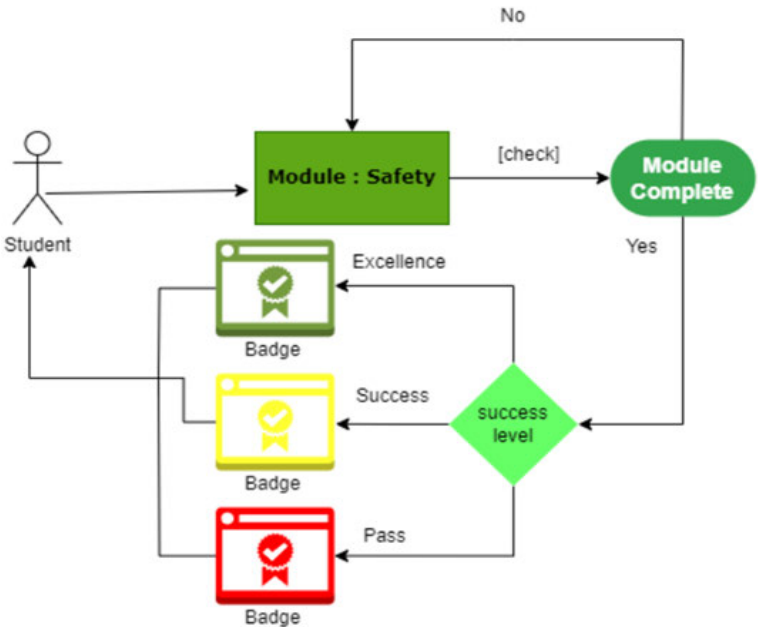

Figure 8. Module completion process.

When a module is completed, a certificate of completion for the individual module is awarded to the learner, as presented in Figure 9. When more than one badge has been awarded to the same learner on the same module (e.g. when the learner exercises multiple attempts on the same module), the highest-grade badge will always supersede, meaning only one certificate and badge will eventually be awarded and exhibited per module.

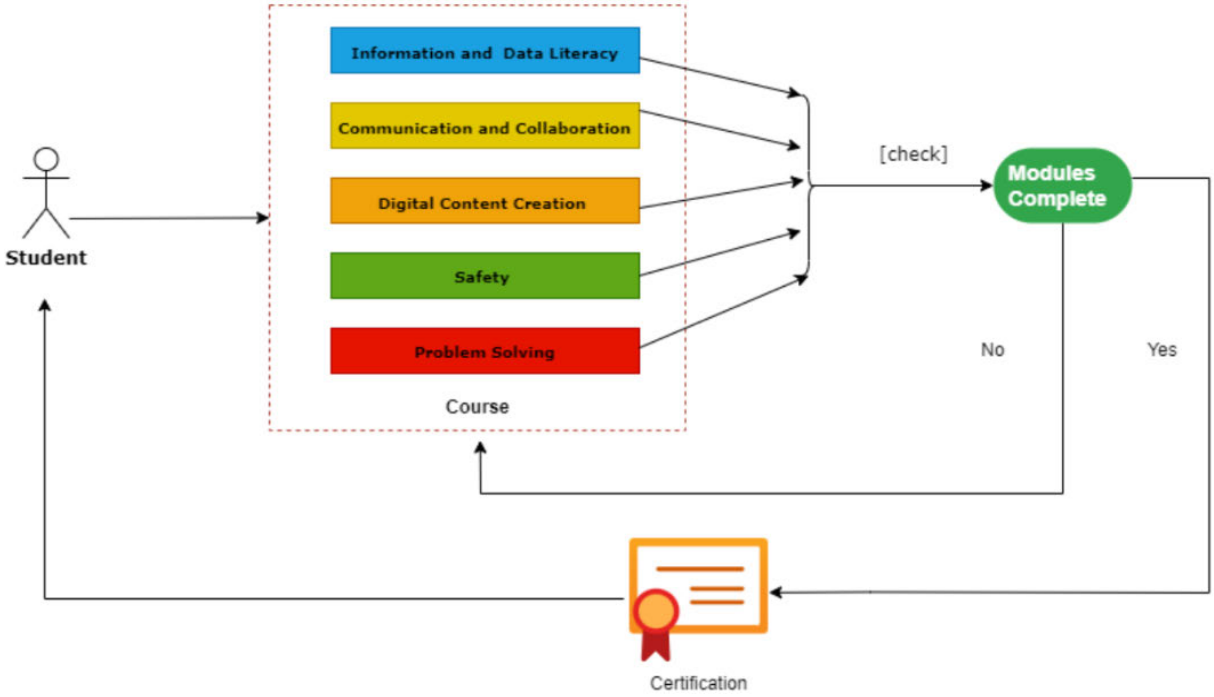

Figure 9. Course completion process.

As noted, upon the awarding of all five badges (one per module, regardless of scores), a certification is automatically issued by the system, recognising completion of the course. For learners who achieve the green color badge in all five modules, the DigiComPass Passport is awarded, signifying a high level of achievement across the DigiComPass course. This differs from the previous process of obtaining a certificate by completing the course requirements, irrespective of success level and respective color badges awarded to the learner. On the contrary, it provides a more distinguished accomplishment for the learner's efforts and excellence in completion of all five modules.

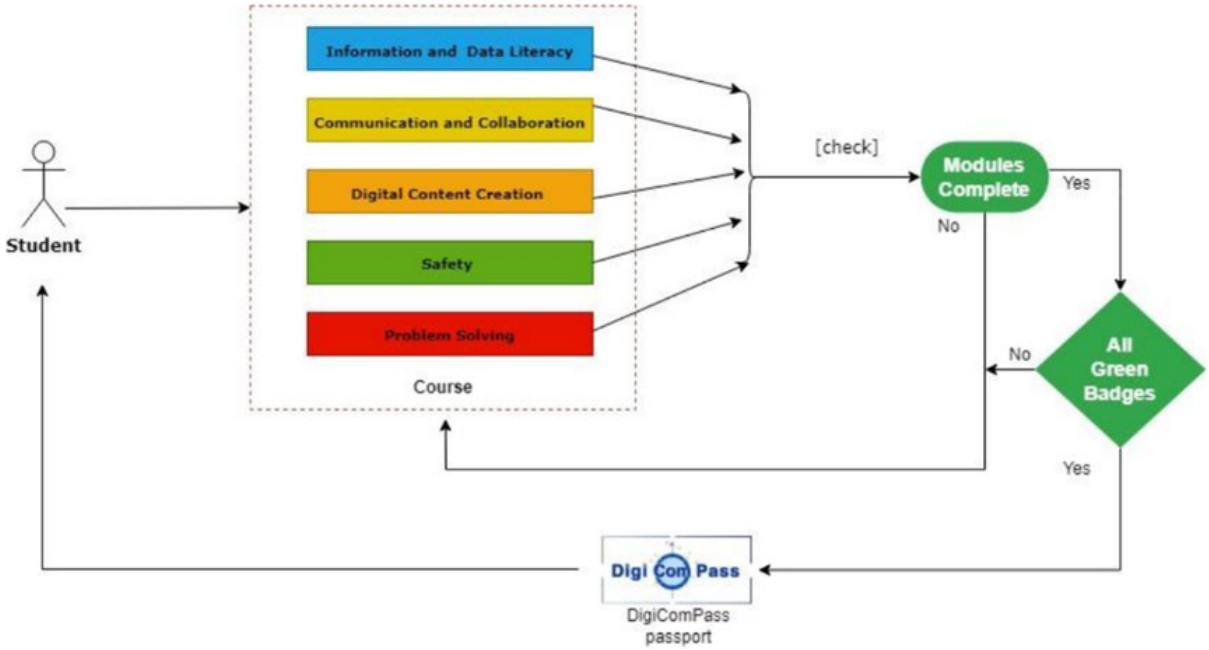

Figure 10. DigiComPass passport achievement process.

The use of an accreditation/recognition system is in alignment with good practices followed in numerous innovative learning formats (including online and flipped learning), where learner achievements are recognized and celebrated with the issuing of visual symbols which can then be showcased in Learning Management Systems such as Moodle or shared online with others. These can be a great source of motivation, rewarding learners for their achievements, pushing them even further. At the same time and because of their intrinsic value and benefits like security, verifiability, convenience, and unlimited power to share with others, the use of this dynamic type of an accreditation system can help in growing participant numbers in training programs. Finally, open badges support a gamification element that further aids in engaging learners.

Badges in Moodle are a feature that enables instructors to recognise and reward learners' achievements within a module/course and serve as visual indicators of accomplishment or skills acquired by learners. When the learner achieves specific criteria or completes certain activities such as quizzes, participates in discussions (forums) or achieves a specific grade (i.e. success level in DigiComPass), badges are earned as a form of acknowledgment. Specifically, Moodle automatically tracks learner progress and awards badges when these requirements are met. Badges can also be issued by instructors based on the completion or achievements of specific activities. Moodle enables learners to share their earned badges on social media platforms or export them as Open Badges [5].

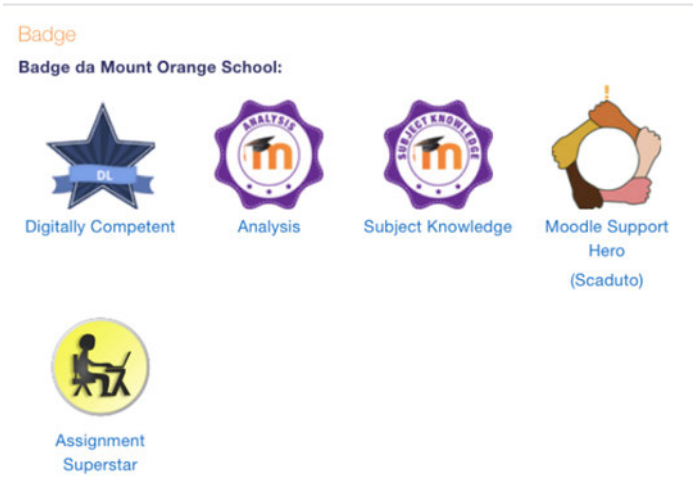

Figure 11. Examples of badges in Moodle.

Open badges are portable digital credentials that provide a standardised way of representing and sharing accomplishments across different platforms and websites. They go beyond just being visual symbols to containing embedded metadata that provides detailed information about the credentials they certify. When an institution issues an Open Badge, this includes information such as the badge name, criteria for earning it, issue date, and even an expiry date for recurring certifications. This embedded information allows other platforms to easily access and verify the badge's authenticity and validity. By tracing back to the issuing organisation, anyone can verify that the badge is genuine and up to date. Another advantage of Open Badges is that individuals have the freedom to store and manage their badges in a centralised location, often referred to as a digital backpack. Platforms like Badgr provide a convenient way for individuals to collect and organise their badges in one place, making it easier to showcase their achievements to others. By utilising Open Badges and storing them in a digital backpack, individuals can have a comprehensive and portable record of their credentials that can be easily shared with employers, educational institutions, or other interested parties. Moodle has integrated support for Open Badges, allowing learners to earn badges within Moodle courses and share them beyond the Moodle environment [6].

Figure 12. Open badge issued with Moodle.

3.5 Accessibility and inclusion

The Individual Learning Space is supported and implemented in the Moodle LMS. With the DigiComPass course targeting a wide range of adult learners, Moodle LMS carries multiple benefits in our pursue for inclusion. Designing learning content in diverse multimedia formats, offering community support and multimedia-based microlearning, as well as a range of assessment tools contributes to inclusion. In addition to designing accessible e-learning content, Moodle LMS also aims for accessibility, promoting two of FL's main building blocks, namely inclusion and diversity.

4 CONCLUSIONS

The DigiComPass e-learning platform is an innovative solution tailored for adult learners seeking to develop digital skills. It is built on a recognition model that resonates with adult education pedagogy, offering a flexible, learner-centered approach that fosters self-directed learning. By incorporating the FL 3.0 pedagogical framework, which adopts a strong blended learning approach, the platform ensures that content delivery is adaptable, engaging, and suitable for a variety of learning styles. Alignment with blended learning also allows learners to access content at their own pace, making the learning process more personalized and motivating.

A key feature of the DigiComPass course is its structure, comprising five distinct modules and administered via Moodle. Employment of accessible, user-friendly environments promote inclusion and diversity. The course design strategically integrates both individual and group learning spaces, fostering collaboration and interaction among such learners. This helps to meet the specific needs of adult learners, who benefit from opportunities to collaborate and share experiences while also working independently. This approach helps to build a supportive learning community.

The DigiComPass course also emphasizes the importance of accreditation and skill recognition, which is crucial for adult learners seeking to apply their competencies in real-world settings. To this end, the platform incorporates open badges, a form of digital credentialing that recognizes the completion of specific tasks or competencies. These badges add a gamification element to the platform, rendering the learning process more engaging and motivating for learners. It also helps to maintain learners' interest and commitment, while also providing them with tangible evidence of their progress and achievements.

In conclusion, the DigiComPass e-learning platform provides a comprehensive and flexible solution for adult learners looking to enhance their digital skills. Its innovative design, rooted in FL 3.0 pedagogy, ensures that the platform meets the needs of diverse learners by promoting self-directed learning, collaboration, and engagement. The use of Moodle and open badges further enhances the platform's ability to promote inclusion, interactivity, and motivation, making it a valuable tool for adult education in the digital age. Through its combination of flexible content delivery, interactive learning spaces, and gamified recognition systems, the DigiComPass platform effectively supports adult learners in acquiring and demonstrating the digital competencies needed for personal and professional success.

ACKNOWLEDGEMENTS

This work was funded under the Erasmus+ grant 2022-1-CY01-KA220-ADU-000085965 titled "Digital Competences Recognition Framework for Adult Education" (DigiComPass). Special thanks go to the project partners for their collaboration, expert insight and commitment throughout the project.

REFERENCES

[1] Bergmann, J., & Sams, A. (2014). Flipping for mastery. *Educational Leadership, 71*(4), 24–29.

[2] Hew, K. F., Bai, S., Dawson, P., & Lo, C. K. (2021). Meta-analyses of flipped classroom studies: A review of methodology. *Educational Research Review, 33*, 100393.

[3] Lee, J., Lim, C., & Kim, H. (2017). Development of an instructional design model for flipped learning in higher education. *Educational Technology Research & Development, 65*, 427–453.

[4] Garrison, D. R., & Vaughan, N. D. (2008). *Blended learning in higher education: Framework, principles, and guidelines*. San Francisco, CA: Wiley.

[5] Moodle Badges (2020). Badge. https://docs.moodle.org/35/it/Badge

[6] Verdaguer, J. (2021). Future-proof your learners' digital credentials with Moodle + Open Badges. https://moodle.com/news/future-proof-digital-credentials-moodle-open-badges/