# DIGITAL COMPETENCES RECOGNITION FRAMEWORK FOR ADULT EDUCATION

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## Abstract

Digital Competences Recognition Framework for Adult Education (*DigiComPass*) is an innovative EU co-funded program that employs a Flipped Learning (FL) 3.0 instructional design to develop, implement and evaluate a 5-module training course on Digital Competencies for Adult Education. Meaningful, real-life tasks, autonomy, targeted support, and increased learner engagement are but a few of the many advantages of FL designs.

In this paper the modules that comprise the course and their respective units are presented. Individual and group learning spaces are essential aspects, providing the foundations for effectively implementing the FL 3.0 approach in this work. Furthermore, activities that could be designed in these two spaces to support and enhance the learning process, making use of Bloom's taxonomy, are likewise introduced.

The *DigiComPass* course will be administered via Moodle, a Learning Management System (LMS) that is also ideal for competency-based training and adaptable in its flexibility for FL 3.0, addressing the needs of both learners and instructors. Moodle is also open source and carries multiple benefits for learners and instructors, including multimedia and community support, as well as a range of assessment tools. Moreover, it is easy to operate and aims to be fully accessible and usable for everyone, including users with special needs and disabilities, further promoting two of FL's main building blocks, namely inclusion and diversity.

An accompanying Recognition Framework Model (RFM) will subsequently be developed, in alignment with good practices on validation in non-formal and informal learning. Current skills are identified and documented, progress is assessed via formative and summative means, and certification is awarded as per learner success. Assessment employs numerous tasks both individual and collaborative, including self-reflection, games and simulations, presentations, interviews, and observations. As part of this accreditation system, open badges will be issued upon successful completion of each module, supporting a gamification element to engage the adult learners, while an online certificate will be awarded upon collection of all badges. In targeting sustained excellence and improvement, there is a need for the recognition criteria and the outlining RFM to be reviewed at regular intervals, resulting in revisions if needed. This will serve the purpose of keeping these updated and aligned with industry standards, emerging trends, and changing needs. Recognition of learner achievements in such a verifiable manner, elevates motivation, enhances professional prospects, and raises participation numbers for similar life-long learning courses.

Keywords: flipped learning, adult learners, recognition framework.

## 1 INTRODUCTION

*DigiComPass* is an innovative recognition model under development, to be implemented for a 5-module adult training course on Digital Competencies. To support the blended learning delivery of content, an instructional design based on Flipped Learning (FL) 3.0 is employed and acts as a quality enhancement framework, with the purpose of developing, implementing, and evaluating the course. The goal is to develop a globally applicable recognition model which would define the curriculum, training environment, evaluation and grading of similar training courses and which would ensure consistent certification.

The course will be administered via Moodle, a flexible Learning Management System (LMS) which carries numerous benefits for the competency-based training offered in *DigiComPass*. Moodle is also able to cater to an important aspect of the recognition model, that is the use of modern digital (open) badges.

This paper presents the recognition framework model along with its major components, i.e., formative and summative assessment, the open badges accreditation/certification system and Moodle. The modules that comprise the training course and their accompanying units are also discussed in detail,

along with related notions such as individual and group learning spaces. Activities that could be developed and added in such contexts are also suggested. The paper concludes with outcomes, recommendations, and future directions.

## 2 METHODOLOGY

The methodology applied in this work is heavily based on the FL 3.0 framework and is presented in section 2.1. Following that, section 2.2 discusses the modules and respective units of the *DigiComPass* training course.

### 2.1 Flipped Learning 3.0

As a framework, FL 3.0 enables the creation of an effective and efficient training program. At present, there is no instructional design based on FL. An essential preparatory step for the *DigiComPass* concept is the development and formulation of such a design. Basically, instructional designs (defined as the systematic processes by which instructional materials are designed, developed, and delivered) consider the individual needs and prerequisites of the learners, the learning objectives and content, as well as the learning environment. At the same time, they aim to facilitate effective and efficient learning [1]. All of these are present in the FL 3.0 Framework, but the end-to-end concept is missing.

The peer-reviewed concept of the "Flipped Instructional Design" covers all essential issues and enhances the FL Framework with missing elements, for example with an inclusion concept. The following paragraphs summarize the Flipped Instructional design, focusing on the keywords from the FL 3.0 Framework, namely pedagogy, andragogy, backward design, Bloom's taxonomy, simple workflow, inclusion, and logical flow.

Pedagogy refers to the methods and practices used in teaching children, while andragogy focuses on strategies tailored for adult learning [2]. The concept of backward design starts with the end in mind, therefore defining desired outcomes before choosing instructional methods [3]. Using Bloom's Taxonomy [4] ensures a range of cognitive processes from basic knowledge recall to critical analysis. The concept of "simple workflow" is essential in the teaching process to maintain clarity and efficiency. It's beneficial to link preparatory materials or pre-learning content to group spaces where collaborative learning happens. In our concept, there is an emphasis to plan to differentiate, tailoring instruction to meet individual needs. With the enhanced "plan for inclusion" approach, there's a concerted effort to plan inclusion for all learners.

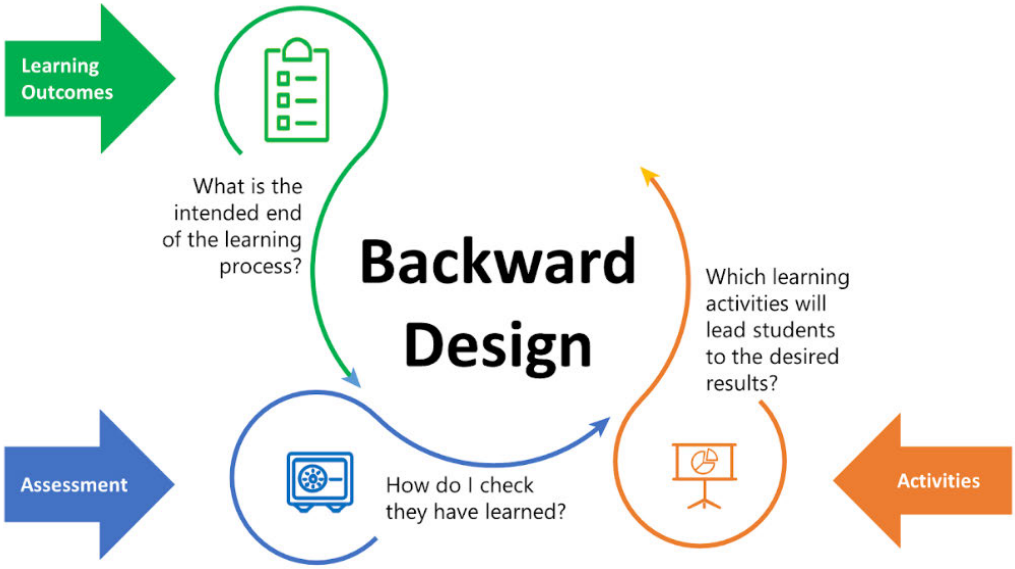


*Figure 1. The backward design process.*

What is more, courses in such designs should maintain a logical flow, progressing in a manner that builds upon prior knowledge and skills. It's crucial to label everything clearly to assist in navigation and understanding. Analysis often precedes instruction, examining current knowledge levels and determining areas of need. Clear learning objectives set the direction for a course, outlining what

learners should know or be able to do by the end. The curriculum and course structure provide a roadmap for both instructors and students, detailing content and sequence. A training content framework outlines the key concepts and skills to be addressed in the training.

There are various training methods employed depending on the content, audience, and desired outcomes. Active training in the individual learning space allows learners to engage with materials at their own pace. The focus is put on multimedia-based and interactive learning content.

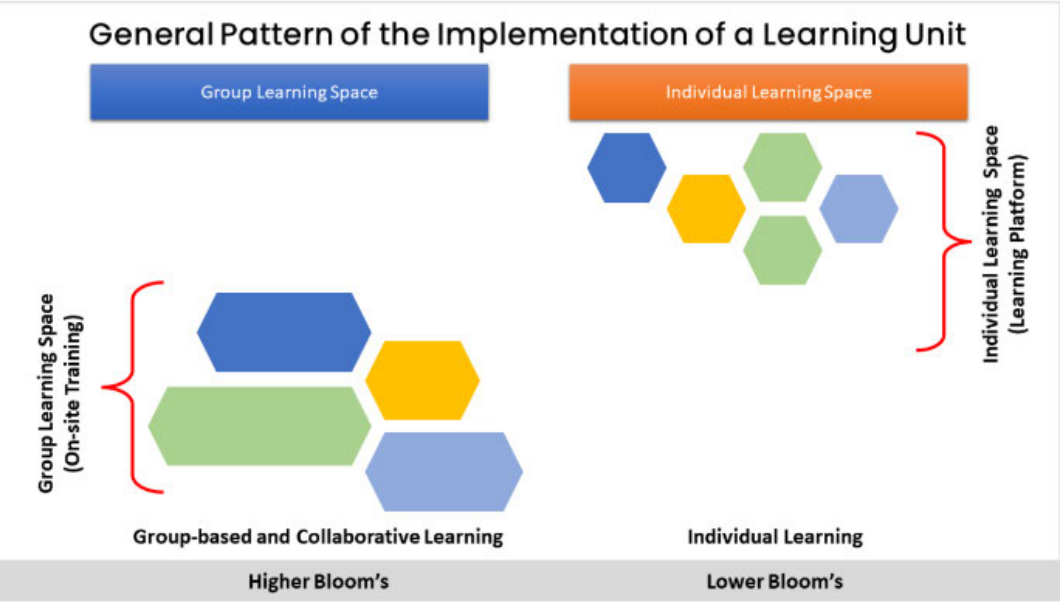


*Figure 2. Structure of the FL course. The individual Learning Space uses the Moodle LMS intensively.*

Conversely, active training in the group learning space promotes collaboration and peer interaction. Training materials are the resources used to support and deliver the content. The individual learning space is a dedicated environment where a learner can focus on content without distractions. The group learning space fosters collaborative learning, discussions, and group projects. Assessment methods are used to measure the learners' understanding and achievement of objectives. Implementation involves rolling out the instructional materials and methods to the target audience.

In terms of support, learner support encompasses all resources and strategies to assist learners in their educational journey. Inclusive support ensures that all learners, regardless of their backgrounds or challenges, are provided with the necessary resources and strategies. Technical support addresses any technological issues that learners might face during the course. Study aids and supplementary resources offer additional materials to assist learners in understanding and mastery. Lastly, peer support emphasizes the importance of learners assisting and guiding each other, fostering a community of mutual growth, and understanding.

Finally, a few words on quality enhancement. As mentioned above, the instructional design of this project acts as a quality enhancement framework, aiming to develop, implement, and evaluate the course. Evaluation measures the effectiveness of the instruction and its impact on learners. Quality enhancement is a continuous process, always refining and improving the education provided. The concept of "Quality Circles", as this has been introduced in FL 3.0, is hence an approach to improve instructional methods by involving all stakeholders in the discussion and refinement process.

## 2.2 Modules and units

The *DigiComPass* Training Course is based on the Digital Competence Framework, commonly referred to as the DigComp Framework, developed by the European Commission [5]. The following modules are included in the course (fig. 3):

1 *Information and Data Literacy*: this module encompasses the skills to search, locate, and retrieve digital content, as well as to judge its relevance and purpose. It also covers the ability to store, manage, and organize digital data.

2 *Communication and Collaboration* highlights the importance of digital communication, emphasizing aspects such as online etiquette, sharing information and content, and using digital tools for collaborative processes and for netiquette.

3 *Digital Content Creation* refers to the skills required to create and edit new content. It involves different formats and expressions like writing, coding, or graphic design. An understanding of copyright and licensing is also vital.

4 *Digital Safety* is paramount. This area of the framework focuses on the skills necessary for safe and responsible use of the digital realm. It covers topics like data protection, digital identity protection, and understanding the potential harms and threats in the digital environment.

5 *Problem-Solving* encompasses the higher-order skills of identifying digital needs and resources, making informed decisions on the most suitable digital tools according to the purpose or need, and solving conceptual problems through digital means.

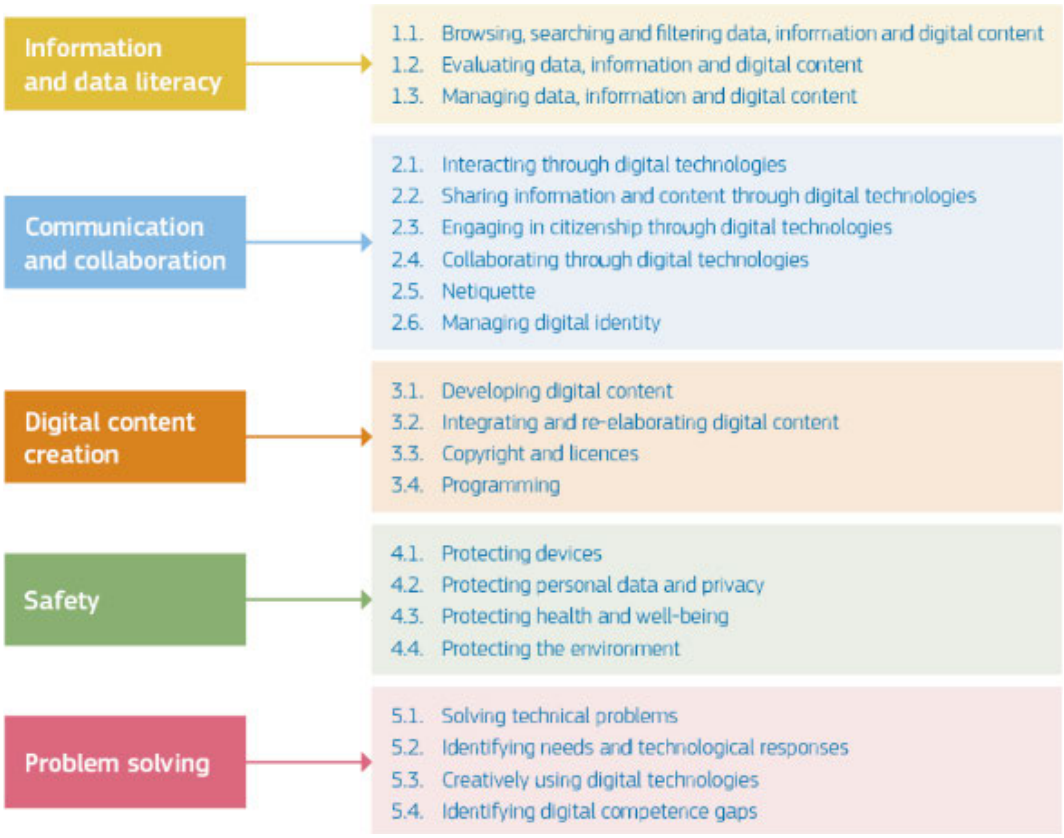


*Figure 3. Structure and content for the implementation of the training course (based in the DigComp Framework).*

## 3 RECOGNITION FRAMEWORK MODEL

A recognition framework for training courses is first and foremost a systematic way of validating and acknowledging the competencies, skills and knowledge acquired by learners attending courses in formal and non-formal settings. As an accreditation system, it assesses, recognizes, and accredits learning outcomes and as such, it can enrich learners' portfolios and enhance their employability prospects. Moreover, the development of special training courses, new approaches to learning and teaching, as well as the experiences created through the provided courses are all important outcomes that heavily depend on the recognition framework, rendering an even greater importance to it.

In all, the recognition framework employed in this project aims to acknowledge learner achievement in each module as measured by the selected assessment methods. This is an effective as much as credible way of certifying competence in, and awareness of, the specific, multi-faceted skills comprising each module, as these are mentioned elsewhere in this paper.

## 3.1 Assessment

Learner performance and competencies for recognition within the training course will be evaluated and assessed based on a set of pre-defined, explicitly stated criteria. For this purpose, both formative and summative assessment will be used. Formative assessment is ongoing for the duration of each module and aims at assessing learner progress and understanding at various stages of the course as well as providing clear indications to trainers to adjust their teaching accordingly. The purpose is to better suit their group and better match learning objectives. It is suggested that this is frequent, diverse and that it allows learners the opportunity to showcase their mastery of various skills acquired in the course. In turn, summative assessment comprehensively measures learner performance and knowledge in the entire course through exams, presentations, projects, or other assignments. It is what essentially defines the grade or certification a learner receives. All forms of assessment should be accompanied by detailed rubrics so that learners are clear of what is being asked of them to achieve, placing added emphasis on having clearly specified learning outcomes [6].

### *3.1.1 Assessment methods and tools*

Numerous methods and tools can be used to assess learner performance throughout each module. These are briefly introduced below:

- Quizzes or tests: these are common assessment methods to determine grades, with varying length as per the learning objectives.
- Questionnaire: a practical tool to measure and assess knowledge and skills at any stage of a program.
- Self-assessment: a learner's reflection on their progress, skills, and achievements.
- Games: an informal way of assessing skills and knowledge amassed.
- Simulations: interactive recreations of real-life scenarios (e.g., a mock interview) via role-play, games, virtual reality etc. Learners can demonstrate their skills and competences and trainers can assess their decision-making, professional competencies, and knowledge application.
- Interview: the trainer interviews the learner to collect detailed qualitative data, focusing on views, perspectives, experiences etc.
- Group discussion: the trainer interviews a group of learners on a topic, to explore views, beliefs, and practices among others. A focus group is an example of this method.
- Role play: the learner's ability to collaborate and work under pressure, as well as their understanding of various roles, can be assessed with this method.
- Observation: the trainer unobtrusively observes learners as they take part in various activities and put their knowledge into practice, to confirm their achievements.
- Portfolio: as a collection of a learner's end-product, this is a valuable assessment method to use, as it provides rich insight into the collective experience, knowledge, and abilities a learner has amassed.
- Reflective learning diary: self-evaluation method, where the learner documents and reflects upon their learning experiences, understanding, knowledge and awareness on specific topics.
- Use of multimedia tools to create an interactive video, an audio recording or do some video editing, generate a chart, create a collage, an interactive presentation, or a brochure, and use infographics. All these are assessment methods that can be used formatively and summatively, and which can provide insight into the knowledge, competencies, and awareness of specific skills of both individual learners as well as of groups of learners. Tools that can be used include, among others, Canva, H5P, Animaker and Synergy.

Table 1 below shows suggested assessment methods for all modules, while Table 2 presents a sample assessment that can be applied for any given module. Trainers and teachers are invited to mix and match as per the specific needs of their groups and their learning objectives. Naturally, assessment methods can be used at intervals and the end of a course, thus the placement of tasks under headings here is indicative.

*Table 1. Assessment methods (all modules).*

| | ***Formative assessment*** | ***Summative assessment*** |
|---|---|---|
| ***Individual space*** | • Self-assessment (written assessment or informal conversation)<br>• Real-life task/Simulation (interactive, mirroring a real-world scenario or case study)<br>• Online poll or survey<br>• Micro-conversation<br>• Questionnaire at intervals<br>• Interviews<br>• Role play<br>• Quiz or test | • Reflective learning diary outlining progress throughout training course<br>• Case study report or analysis (analyzing a real-world case study)<br>• Problem-solving exercise<br>• Portfolio (samples of reflections, projects, other artefacts)<br>• Final exam (multiple choice and open-ended questions)<br>• Interactive quiz or simulation<br>• Capstone project (comprehensive project addressing a real-world problem) |
| ***Group space*** | • Self-assessment (group project or focus group)<br>• Peer assessment<br>• External evaluation | • Virtual group presentation (interactive/live webinar)<br>• Online collaborative project<br>• Case study analysis<br>• Group discussion or debate<br>• Virtual symposium |

*Table 2. Sample assessment (any module).*

| | ***Formative assessment*** | ***Summative assessment*** |
|---|---|---|
| ***Individual space*** | • 2 quizzes (self-evaluation):<br>- Unexpected shutdown<br>- Basic troubleshooting techniques<br>- Questions in an interactive presentation<br>• Simulation of a real-life scenario<br>• Questionnaire (self-assessment, feedback) | • Multiple-choice self-evaluation |
| ***Group space*** | • Action research-based observation of group activities<br>• Group project (presentation) | • No summative evaluation |

## 3.2 Accreditation system (open badges)

The accreditation/recognition model applied, defines learner achievements according to three success levels, and badges will be issued in three colors as follows:

- Level 3 badge (Red) = Pass (course attended, no summative evaluation, overall score of 1-30%)
- Level 2 badge (Yellow) = Pass with success (overall score of 31-60%)
- Level 1 badge (Green) = Pass with excellence (overall score of 61-100%)

Completion of a module leads to the issuing of the respective badge, as per the learner's overall score. When all 5 badges have been awarded (regardless of color), learners receive a Certificate. Should all badges be green (i.e., learner averaging scores of over 61% in each module), then the *DigiComPass Passport* is also awarded.

The complex nature of individual learning, towards which similar training courses are directed, renders validation, as this was introduced by the European Centre for the Development of Vocational Training (Cedefop) [7], an essential tenet of the recognition models employed in such contexts. Due to its format, validation is highly adaptable to a plethora of contexts and purposes. It is essentially a 4-phase model consisting of identification (of learners' existing competences), documentation (collection of proofs of such competences), assessment (formative, summative or other) and certification (in this case, through the issuing of badges and certificates) of one's skills and competences acquired in formal, non-formal and informal settings [8].

The use of an accreditation/recognition system renders the validation process consistent with good practices in innovative learning formats (including online and flip learning as these are applied in this project), where learner achievements are recognized and celebrated with the issuing of visual symbols, which can then be showcased in LMS (e.g., Moodle), or shared online with others. These can be a great source of motivation, rewarding and pushing learners even further, and persuading others to join similar programs. At the same time and because of their intrinsic value and additional 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 [9]. Pertaining to lifelong and life-wide learning in particular, validation is crucial both in ensuring the visibility as well as in indicating the appropriate value of one's learning [10].

Finally, administering *DigiComPass* via Moodle allows instructors and learners great flexibility and adaptability. Benefits such as support, ease of use and accessibility further promote inclusion and diversity, making such a platform well-suited to FL. Moodle can to a large extent be autonomous in its tracking of learner progress and in issuing badges accordingly, as per the parameters set by instructors.

## 4 CONCLUSIONS

In targeting sustained excellence and improvement, there is a need for the Framework and the recognition criteria to be reviewed at regular intervals. This will serve the purpose of keeping the above updated and aligned with industry standards, emerging trends, and changing needs. It is also crucial to maintain and improve teaching quality and learner experiences. To that end, learner feedback at the end of each module can provide useful insights in areas such as learner experiences, clarity, comprehensibility, cohesion and structure of modules, correspondence of course content to learning outcomes, assessment methods, trainer expertise and performance, quality and level of activities and other materials and the recognition framework itself (badges, certificates). Interim evaluations of modules could also take place at set intervals, potentially leading to adjustments in the designing of modules and in the administration of the materials and assessment methods.

In terms of the current developments in the project, we are in the process of developing the content of the five modules and at the same time setting up the basic infrastructure of the Moodle Learning Management System (LMS), where the recognition framework will eventually be applied from a technical perspective. As future work, we aim to report on the final modules, as well as on the technical development of the final version of the Moodle Learning Management System (LMS), which will be designed to address the accessibility and usability issues experienced by older adult users, in a follow-up paper.

In summary, we believe the project will have a considerable impact to society in multiple ways. It will extend and develop the educators' competences, particularly in the effective use of ICT in adult learning, for better outreach and improved learning outcomes. It will likewise promote the use of digital competences (in all groups in society, in terms of digitally literacy). It will offer effective provision for enhancing basic skills, especially digital competences. Moreover, it will increase the capacity and readiness of the participating institutions in the project to manage an effective shift towards digital education. Lastly, it devotes attention to the development of digital pedagogy and expertise in the use of digital tools for teachers, including accessible and assistive technologies and the creation and innovative use of digital education content.

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