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Evaluation of a training programme to foster employability skills in professional training: a case study

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Evaluation of a training program to foster employability skills in professional training: a case study

ABSTRACT

Purpose: The aim of this work is to evaluate the effectiveness of a training program for developing employability skills including digital competency and soft skills (problem-solving, teamwork, adaptability, leadership, decision making and creativity) in professional-training programs.

Design: It presents a case study, where students from a professional training center were evaluated twice, before and after doing the program. The results from both were compared to determine whether there have been improvements. We also analyzed whether there were differences by gender in the pretest and the posttest.

Results: We observed that most of the students improved in both digital competency and in soft skills after completing the program. In the case of digital competency, greater improvement was apparent in the areas of collaboration and communication and in digital content creation. Similar results were found for all competencies in the case of soft skills.

Originality-value: This learning program had a positive impact on the competency development of professional-training students. Continuous training and advice for teachers and personalized monitoring during the implementation of this program resulted in an improvement being apparent in students' employability skills.

KEYWORDS

Digital skills, soft skills, vocational training

INTRODUCTION

The society of the 21st century demands personal and employability skills that go beyond specialization in different areas of technical-professional knowledge and skill. The growing complexity of the world puts professional-training institutions in a challenging position as they are expected to turn out graduates with relevant employability skills (Canossa, 2019; Reid, 2016; Tito & Serrano, 2016)) as well as a creative, critical and innovative sense that enables them to provide solutions for sustainable-development needs that will help the well-being and evolution of humankind (Bourn, 2020). The technological advances that are making themselves felt in different circles of the population contribute to greater well-being, but they also demand people who can adapt to changing situations that require responses with flexibility and professionalism.

The capacity people demonstrate to solve problems, make good decisions in the workplace, be creative and know how to adapt, communicate effectively, and assume leadership within their work team, will give them advantages with employers who prefer employees who possess these capacities. For this reason, these have also been called employability skills (Laguna-Sánchez et al., 2020; Succi & Canovi, 2020; Martínez et al., 2019; Fernández, 2007). Graduates from training institutions who can demonstrate these competencies and skills will have more opportunities to choose between the varied and changing options found in the job market. This is especially so in the volatile contemporary world where new occupations are appearing that often have no specific training, but where know-how is built as products and services developed to meet the multiple needs of different scientific, technological, socio-humanistic, artistic, and other fields (Cotronei-Baird, 2020). All these areas are immersed in a highly technological society. This is one of the characteristics of the information society in which we currently live, and job requirements are focused on digital competencies, soft skills, in addition to technical skills (Agila-Palacios et al., 2022; Almeida and Morais, 2023 y Saunders and

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3 Bajjaly, 2022). This is why digital competencies and soft skills are highly valued in working
4 environments and by business leaders (Nahum Lajud et al. 2021; Robles, 2012; Przytuła, 2018;
5 Chamorro-Premuzic, 2019; ManpowerGroup, 2019). Like these authors, as well as Fernández (2007),
6 Infante-Moro, et al. (2019), Martínez et al. (2019), and Moreno-Murcia et al. (2021), we describe these
7 as employability skills.
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10 This study aims to underline the importance of institution-driven development of employability skills.
11 We consider employability competencies to be digital competence, problem solving, teamwork,
12 adaptability, communication, leadership, decision making and creativity. In the background review,
13 no studies have been found that report specific training in all these competencies at the same time.
14 Hence, from the research point of view, this work constitutes a novel contribution in the area and
15 focuses on the Spanish territory.
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18 It should be noted that In Spain there is a study pathway called *formación profesional (FP)*, or
19 professional training, which is intended to offer training aimed at specific occupations. It does this by
20 providing intermediate and higher-level training cycles in which different specialisms can be studied.
21 In these professional training (FP) cycles, content is organized in modules that are studied over two
22 consecutive academic years (Real Decreto 1147/2011). On completion of professional training,
23 graduates are expected to have obtained professional and occupational competencies that ensure
24 they are employable. However, training in this type of competencies has turned out to be a major
25 challenge, given that traditional teaching frameworks in which students are passive agents and still in
26 place or students are not offered practical experience that enables them to test the competencies
27 that are being developed (Tito & Serrano, 2016).
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30 In this sense, many studies have found that graduates from the different training cycles reproduce
31 procedures their workplaces that they repeated during their learning period (Domínguez-Fernández
32 et al., 2020; Infante-Moro et al., 2019; Sánchez & Aguirre, 2018). Consequently, it is important to
33 consolidate innovative teaching practices based around active methodologies that position the
34 student at the center of learning and demand digital and research competencies as well as problem
35 solving, taking the initiative, being creative and being capable of working collaboratively, as observed
36 by Campaña-Jiménez et al. (2019), Martin et al. (2020), Romero-García et al. (2020), Tito and Serrano
37 (2016) and Torres Valdés et al. (2018). Training based on these methodologies will enable students to
38 develop the competencies in question, providing them with advantages in their professional career
39 and giving them greater possibilities of employability (Rahmat, et al., 2017) regardless of gender
40 (Pérez-Escoda et al., 2021).
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44 Considering what has been argued previously, an intervention program aimed at second-year
45 students, who on completing it would join the field of employment, was implemented in a professional
46 training school (CampusFP) to develop and implement employability skills that are regarded as vital in
47 contemporary society. The purpose of the program is to help students develop digital and soft skills
48 with the aim that they will put their competencies into practice for purposes of employability. To do
49 so, the teachers were trained and advised on planning curriculum activities to facilitate practicing
50 employability skills. A process of review and adaptation of the activities was carried out so that the
51 competencies could be evaluated. This educational intervention with these characteristics is the most
52 novel from a practical point of view in this study.
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56 On the other hand, we analyzed the effects of the implementation of this training program for the
57 improvement of these competencies in a professional training center (CampusFP), which also
58 contributes to a better understanding of the Spanish educational environment, since we did not find
59 any precedents of this type of follow-up in the country. In this sense, Brunet & Böcker (2017) found
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3 that studies on professional training in Spain (PTS) focus on highlighting the reforms that have been
4 adopted until reaching the dual model like the German one, and Echeverría & Martínez (2021)
5 emphasize the need to develop an ecosystem of research in PTS in which all the actors involved
6 participate in order to revalue PTS.
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10 **THEORETICAL FRAMEWORK**

12 With the large-scale digitalization of almost all services, operations, procedures and transactions, and
13 the increasingly common presence of digital artefacts in every work setting, digital competencies are
14 in ever greater demand (Infante-Moro et al. 2019). These can be understood as the set of skills for
15 effectively handling technological devices, managing information and learning, communicating,
16 creating digital products, being creative, interacting, working in a team, having a critical sense, being
17 flexible, autonomous and ethical and being able to solve problems, and so it is included in the set of
18 employability skills (Infante-Moro et al., 2019 and Martínez et al., 2019). Recent contributions in
19 training for employability and digital skills development include the adaptation of educational
20 institutions to digital transformation scenarios, the importance of continuous training considering
21 experience, context and social learning, and the use of digital technologies as a central object in the
22 training of professionals. For example, DeFreitas (2022) has tested a virtual training model to deliver
23 digital/data literacy programs to marginalized youth across the Caribbean region, emphasizing the
24 importance of ICT skills for employability. In addition, Triyono et al. (2023) bibliometric study on
25 employability skills and their relationship, based on 1070 papers (Scopus 2022 and 2023), found that
26 research focuses on employability skills, higher education, curriculum, employment and vocational
27 training. Meanwhile Hasbullah et al. (2022) highlighted the importance of upgrading vocational school
28 facilities to prepare graduates with digital talent and employability skills, emphasizing the importance
29 of technical skills and employability skills for today's workforce. The importance of considering the
30 development of these types of abilities is such that in late 2021 the European Union launched the
31 Digital Skills and Jobs Platform online portal where any citizen can complete a self-evaluation
32 questionnaire on digital competencies and access a variety of information relating to the topic.
33 Likewise, the European Commission has given priority to the development of digital competencies to
34 favor social inclusion and employability (Europa Commission, n.d.). Even now, digital competencies
35 for handling AI should also be included. Recently, UNESCO (2023) has proposed AI competency
36 frameworks for teachers and for school students because it recognizes the emergence of an AI literacy
37 skill set necessary for effective human-machine collaboration and recommends taking institutional
38 measures to improve AI literacy at all levels of society. Various models have been proposed for
39 studying and training in digital competencies. One of them is the Marco Común de Competencias
40 Digitales (common framework for digital competencies) of Spain's Instituto Nacional de Tecnologías
41 Educativas y Formación del Profesorado (national institute for educational technologies and teacher
42 training) (INTEF, 2017), which proposes five competency areas and twenty-one competencies
43 organized in six levels. And it is the frame of reference for this study.
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51 In the training program that we analyze in this article, three of the areas are classed as specific
52 (information and data literacy; communication and collaboration; and content creation) and two are
53 classed as transversal (security and problem solving). This study considers the three specific areas of
54 competency, as they are directly related to employability as shown in the studies by Di Gregorio, et
55 al. (2019), Infante-Moro, et al. (2019); Picatoste et al. (2018); and Pirzada and Khan (2013). These
56 authors recommend training young people in digital competences to improve their employability. And
57 that is part of what is done with this educational intervention.
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3 Moreover, various studies have emphasized the importance of soft skills in the professional sphere
4 (Almeida and Morais, 2023; McCrary, 2022; Green-Weir et al. 2021; Moreno-Murcia et al., 2021;
5 Nahum Lajud et al., 2021; Succi & Canovi, 2020; Rebele & Pierre, 2019; Patacsil & Tablatin, 2017) and
6 as a factor in finding employment (Okolie et al., 2021). Soft skills are defined as a set of personal
7 abilities, skills and attitudes that focus on socio-affective, cognitive and strategic aspects that affect
8 interpersonal relations, working with others and achieving shared goals at a personal and
9 organizational level (Tito & Serrano, 2016). A lack of these skills impedes professional development
10 (McCrary, 2022; Succi & Canovi, 2020; Przytuła, 2018). Recent studies highlight the interest in
11 measuring the relationship between these competencies, for example, for example Rashidi et al
12 (2022) constructed a survey instrument known as Soft-Employability Skills Kit (SES-KIT) and to assess
13 its reliability among Technical and Vocation Education Training (TVET) students. SES-KIT was derived
14 based on a mapping of eight employability skills frameworks and the top ten skills in the 21st century
15 skills including en World Economic Forum, 2020. Although the results indicated a high level of validity
16 and reliability, they suggest further research along these lines since their sample was small (n=39).
17 Other study conducted in India aimed to analyze the relationship between soft skills training and
18 employability competency in higher educational institutions (HEI). Karl Pearson's Correlation test was
19 applied to find out the relationship between Soft skills training and Employability Competency. The
20 study highlighted the importance of lifelong learning in enhancing employability and the need for
21 students to be aware of the potential of soft skills (Kumar, 2022).
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26 On the other hand, an interesting case study was conducted by Zouali et al (2023) in Morocco, where
27 they examined the development of soft skills, such as critical thinking, collaboration, and
28 communication, among secondary school students through in-person training. The study aimed to
29 explore the effect of soft skills training on students' employability skills development. They relied on
30 project-based learning and experiential learning, and the program lasted one month. These
31 contributions reflect the ongoing efforts to understand the relationship between soft skills training
32 and employability, develop effective instruments to measure soft skills, and enhance soft skills training
33 in various educational and professional contexts to improve employability.
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37 Furthermore, in relation to the other competencies from the set of soft skills, evidence about
38 productivity in problem solving and seeking alternative courses of action when working collaboratively
39 or working in a team has been found (Mora, et al., 2020; Hains-Wesson & Ji 2020; Oliveira et al., 2020).
40 Abilities are required that help to overcome differences and favor the capacity to adapt to situations
41 and circumstances, and to interpersonal relations. Another competency that has become more
42 important is communication, especially, since the great increase in remote work following the Covid-
43 19 pandemic (García-Ruiz & Pérez-Escoda, 2020; García, 2020; Ma, 2021). No less important are the
44 competencies for leadership, decision making and creativity as transversal skills that are indispensable
45 for any company, institution, or entrepreneur to confront the changing job market of the 21st century
46 (Bennett et al. 2020; Supriyanto, et al. 2020; Martono, et al. 2020) and so fostering the development
47 of these competencies is an urgent task for professional training establishments. Moreover, this is
48 revealed by multiple research projects in the area as highlighted by Dinh et al. (2023) in the
49 bibliometric review of research on employability. Likewise, these authors found an important line of
50 research highlighting job-embedded learning to favor employability, which coincides with the
51 conclusions of Padgett and Donald (2023), and this is what can be achieved in training centers oriented
52 to the development of work competencies.
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56 To have a broader perspective on this issue, it is also necessary to consider the point of view of social
57 exchange theory, which emphasizes social interactions in the work environment and how these
58 interactions influence organizational relationships and outcomes. In this sense, employability depends
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not only on the employee and his or her competency development or the social capital he or she can build within the organization (Irigoyen,2021), but also on the employers and the development opportunities they offer such as remuneration, security, opportunities to lead, recognition and favoring the balance between work and personal life. All these factors contribute to employee satisfaction, which affects turnover tendency and contributes to job and organizational stability as noted by Aman-Ullah et al. (2022a), Aman-Ullah et al. (2022b), Aman-Ullah et al. (2022c), Aman-Ullah et al. (2023), and Mohd Zin et al. (2023).

Likewise, employability cannot be solely attributed to training in digital competencies and soft skills; it is influenced by various factors such as the level of business or industrial development, demands in society, socio-environmental and socio-economic conditions, work culture, entrepreneurial attitude, and technological advancements. Moreover, the increasing use of artificial intelligence tools and industrial robotics is transforming employability conditions. Therefore, in the field of education, there needs to be a greater emphasis on utilizing AI-based technology to personalize learning and adapt training strategies in accordance with students' employability prospects (Marwan,2020, Mezhoudi, 2023; Pagani et al.2023). This challenge must be acknowledged and addressed by professional training institutions.

Although considering the impact of training on employability directly in organizations is an important field of research, on this occasion the authors of this paper have focused on the factor of training before leaving the educational institution. Hence, the main objective of this paper is to evaluate the effectiveness of this training program in developing the following competencies: digital competence, problem solving, teamwork, adaptability, communication, leadership, decision making and creativity. Therefore, we propose the following hypotheses:

H1: The training program applied in FP campus positively affects the development of digital competencies of trainees.

H2: The training program applied in campus FP positively affects the development of problem solving skills, teamwork, adaptability, communication, leadership, decision making and creativity of students in training.

METHOD

Training program

This paper presents a case study (Villarreal & Landaeta, 2010)to analyze the results of the training program developed in an educational institution of official vocational training, called CampusFP. This type of methodology was selected to study the results implementation of the program the real-life context. It is located in the community of Madrid (Spain). It is characterized by a practical pedagogical model, one of the main objectives being to provide students with a series of skills that guarantee employability. This is the context of the study presented below, in which an educational innovation project is developed. This project has focused on the design of a training program aimed at the acquisition and development of digital competences and employability skills of students and the certification of these skills at the end of the program. To this end, firstly, an analysis of the educational practices carried out in the school was carried out. After the analysis, pedagogical guidance has been offered to teachers in order to adapt teaching and learning activities to enable the development of digital and employability skills in students.

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3 The training program designed is implemented in three higher education cycles: Marketing and
4 Advertising, Multiplatform Applications Development and Clinical and Biomedical Laboratory. The
5 modules selected for implementing the training program were Business and Entrepreneurial Initiative
6 and Occupational Training and Guidance. Both modules are transversal and are studied in all three
7 higher education cycles mentioned above, with the same content and methodology. Both modules
8 (Business and Entrepreneurial Initiative and Occupational Training and Guidance) use an active and
9 participatory learning model that facilitates interaction and motivation with the aim of involving
10 students in their own learning process to achieve meaningful learning, where the student is the central
11 figure, and the teacher is a guide and facilitator of the process. The teacher designed theoretical-
12 practical activities that are integrated into the problem-based learning and project-based learning
13 methodologies. The aim is for students to acquire the content and competencies relating to the
14 module, as well as the necessary employability skills that are being studied. In group activities,
15 students worked using collaborative learning dynamics that incentivize participation, division of tasks
16 and negotiated decision making. To facilitate interaction and digital competence development in the
17 activities, different digital tools from the *Google Workspace for Education* environment were
18 integrated (Oliynyk et al.,2021). All the activities carried out were recorded on the Classroom platform.
19 A common structure was previously determined to present each didactic unit developed on the
20 platform. This structure includes the following sections for each didactic unit: preliminary questions,
21 theoretical-practical development, activities and practical exercises, revision activities and extension
22 elements and support material. Prior to the implementation of the training program, the teachers
23 involved received training on the methodologies and digital tools used. The activities were reviewed
24 to ensure that they were in line with the development of the competencies they were intended to
25 develop and assess. Figure 1 shows the support framework for developing employability skills with
26 the aim of facilitating the visualization of the elements considered for training.

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28 Students were evaluated at the beginning and end of the training program. Finally, the students
29 receive a certificate from the CampusFP educational institution that certifies for the job market the
30 level attained in each of the competencies evaluated.

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33 **Figure 1.** Framework for the development of employability skills at CampusFP

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35 Source: created by the authors ([Available online](#))

36 37 38 **Research design**

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40 To evaluate the results of the effectiveness of the intervention program, a quantitative methodology
41 was used with a pre-experimental pretest and posttest design. The variables studied following the
42 intervention were digital competency and soft skills, in this case, competencies in: problem solving;
43 team work; adaptive capacity; communication; leadership; decision making; and creativity. The
44 teachers evaluated each student in the competencies being studied at two different moments: at the
45 start and the end of the two training modules described in the educational intervention section. This
46 was done to determine whether the level of the competencies changed compared with the initially
47 determined level after carrying out the learning experience.

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50 Prior to the implementation of this intervention program, a pilot test was carried out during the
51 previous academic year (September 2018 to April 2019) with a sample of 68 students, belonging to 4
52 different classes, and in which three teachers from the areas of Marketing, Computer Science and
53 Clinical and Biomedical Laboratory participated. The pilot study was used to test the training program
54 and the instruments used to evaluate the competencies developed. The results are not shown, but an
55 improvement was obtained in all the competencies analyzed which were those mentioned above. The
56 results obtained were considered proof of the success of the program for the development of

competencies and the reliability of the measuring instruments used. Subsequently, the study was extended to a larger sample size, and these are the results presented in this paper.

Sample

We used non-probability convenience sampling. A total of 114 students participated in this study. They were studying a higher-level training cycles at the CampusFP, on the Marketing and Publicity, Development of Multiplatform Applications and Clinical and Biomedical Laboratories training cycles. The sample size represents 28.5% of the total number of students enrolled in Campusfp. It should be considered a case study that allows generalization to the population of this institution. Of them, 51 % were female and 49 % male, with a mean age of 19.

Instrument

To determine the change in problem-solving, teamwork, adaptive capacity, communication, leadership, decision making and creativity competencies after implementing the intervention, a rubric was used that had previously been validated through expert opinions (Sánchez-Ramírez et al., 2022), show in Appendix 1. For each competency, three levels of acquisition are established (1. Basic, 2. Intermediate and 3. Advanced) as well as various indicators for each of them that represent the observable behaviors derived from the pre-established levels that facilitate the evaluation and development of the competencies. The rubric was converted into a questionnaire that each teacher used to evaluate the students in the corresponding competencies. We determined the instrument's reliability using Cronbach's alpha. This gave a value of 0.961, which is considered to be adequate for measuring employability skills.

A rubric validated in previous studies was used as an instrument to determine the level of digital competency (Marcano et al., 2020), show in Appendix 2. This rubric considers three of the five areas of digital competency established in the common framework for teachers' digital competencies developed by INTEF (2017). The areas and competencies evaluated are set out below. Area 1. *Information and data literacy*, with subareas 1.1. Browsing, searching, and filtering data, information and digital content, 1.2. Evaluating data, information and digital content and 1.3. Managing and retrieval of data, information and content in digital environments. Area 2 *Online communication and collaboration*, including sub-areas 2.1. Interaction using digital technologies, 2.2. Sharing information and content through digital technologies, 2.4. Collaborating through digital technologies. Finally, Area 3. *Digital content creation with subareas 3.1.* Digital content development and 3.3. Copyright and intellectual property licenses. Three levels of achievement were established for each subarea (1 Basic, 2 Intermediate, 3 Advanced) and for each of them, a variable number of indicators were established making it possible to evaluate the level achieved. To evaluate the level achieved by the students in each subarea, the rubric was converted into a questionnaire, with the reliability of the instrument determined by Cronbach's alpha. This was 0.961 and so the questionnaire was considered adequate for measuring the level in each competency of the students.

The research design and the instruments to be used for the assessment of competences were approved by the Campusfp management team. The study was conducted with the consent of the CampusFp management team. The students were informed about the research in which they were going to participate and were guaranteed anonymity. All of them agreed.

Data analysis

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3 First, we determined whether the data obtained regarding the evaluated competencies followed a
4 normal distribution using the *Kolmogorov–Smirnov test* with the *Lilliefors correction and the Shapiro–*
5 *Wilk test*. Next, we used the *Wilcoxon* signed-rank test to analyze possible changes caused by the
6 program in the levels of each evaluated competency in the students. Finally, for all the group
7 comparisons, the effect sizes (Cohen's *d*) were calculated, with values of $d = 0.10$ to 0.30 classed as
8 small, 0.31 to 0.49 medium, 0.5 to 0.79 large and $d \geq 0.8$ very large (Cohen, 1988). We also considered
9 potential differences in the competencies analyzed according to the sociodemographic variable of
10 gender. To do this, we used the *Mann–Whitney U* nonparametric test, since the variables did not fit a
11 normal distribution.
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14 We organized, coded and analyzed the data using the SPSS 25 statistics package.

15 RESULTS

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18 First, we performed the Kolmogorov–Smirnov tests for normality with the Lilliefors correction and the
19 Shapiro–Wilk test. In all cases, the calculated statistic gave a significance of 0.000 and so the null
20 hypothesis was rejected and, therefore, the samples are non-normal and the *Wilcoxon* signed-rank
21 test for nonparametric samples was applied.
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24 Tables 1 and 2 show the descriptive statistics obtained for each area of digital competency, as well as
25 the result of the posttest–pretest comparison using the *Wilcoxon* test.
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29 **Table 1.** Descriptive statistics of the digital competency areas.
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33 The data in Table 1 show that the students started with a medium-low level of digital competency (1-
34 2), mean between 1,52 (Evaluating information) and 2,24 (Navigation, search and filtering of
35 information) and all of them improved following the intervention (2-3): mean between 2,19
36 (Evaluating information) and 2,66 (Navigation, search and filtering of information). The standard
37 deviation become lower (0.656-1.131 to 0.453-0.935), so the level of all-of-the students tend to
38 equalize. The greatest improvement was experienced in the areas of Communication and online
39 collaboration and Digital content creation (1.69-2.72 in Sharing through digital technologies).
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43 At first, all of them best performed at all areas evaluated of Digital Literacy whereas Evaluating
44 Information (Communication and online collaboration) and Copyright and Licenses (Digital content
45 creation) obtained the worst scores whereas Navigation, search and filtering of information and
46 Evaluating data, information and digital content (Information and digital literacy) performed the best.
47 After the training, all of them progressed more or less equally..
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50 **Table 2.** Result of the comparison with the *Wilcoxon* test for digital competency.
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54 The results from the *Wilcoxon* test show (Table 2) that the changes in the measurements were
55 significant in all of-the subareas of-digital competencies and the effect of the intervention was very
56 large ($d \geq 0.8$) except for the case of-Interaction using digital technologies subarea where the effect
57 was large ($d = 0.67$).
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Table 2 shows that 41% of students improved their digital literacy versus 3% that get worse, 56% of then do not change their evaluation. The subareas were most students improved, were Copyright and Licensing (70 positives) and Digital content development (57 positives) (Digital Content creation) and the least were Interaction using digital technologies (26 positives) and Sharing information and content through digital technologies (27 positives), both belong to Online communication and collaboration area. The number of students that got worse in Digital competency varied between 0 in Storage and retrieval of information (Information and data literacy), 0 in Sharing information and content through digital technologies (Online communication and collaboration) and 7 in Collaboration using digital channels (Online communication and collaboration).

Tables 3 and 4 show the descriptive statistics for the soft skills studied and the results of the comparison carried out using the Wilcoxon test (significance greater than 0.001).

Table 3. Descriptive statistics for soft skills.

The data in Table 3 show that the students started with a medium-low level (1-2). They best performed at Team work (2.01) and Leadership was the worst score (1.75). After the training, the students improved in all the soft skills. Team work continued being the best (2.46) and Leadership the worst (2.23) and differences among then are similar to the beginning.

In the case of soft skills, we also observe that students start with a medium-low level (1–2) and improve to medium-high (2-3), except in the case of Teamwork, which already had good scores and also improves. We should note that we did not observe a reduction in standard deviation that was as notable as in digital competency. Standard deviations in soft skills are lower (0.762-0.824 in the pretest and 0.719-0.838 in the posttest) than in Digital competency (0.656-1.131 in the pretest and 0.577-0.935 in the posttest).

Table 4. Result of the comparison with the Wilcoxon test for soft skills.

Table 4 illustrates how, in the case of soft skills, there are significant differences between the pretest and posttest measurements with a very large effect of the intervention according to Cohen (1988) in all competencies ($d > 0.8$). It shows that 44% of students improved their soft skills versus 3% that get worse, 53% of then do not change their evaluation. This difference is greater in the case of problem solving, adaptability and communication. Similar number of students improved their performance in Soft Skills between 40, in Decision making, and 54, in Problem solving. The number of students that got worse were between 2 in Team work and Leadership and 6 in Adaptability.

We then analyzed whether there are significant gender differences by applying the *Mann–Whitney U* test for independent samples to each variable. We found no significant differences for digital competencies or for soft skills competencies.

DISCUSSION

In this study, we set out to evaluate a training program to develop the employability skills of students attending a professional training center. This was in response to employers' demands (Przytuła, 2018) and is an attempt to close the gap between the competencies of graduates from formal education and the demands of society and the employing companies and institutions as recommended and emphasized by Canossa (2019), Cotronei-Baird, (2020), Chamorro-Premuzic, (2019) and Di Gregorio et al. (2019). The digital competencies needed to perform in the digitalized world in which we live (Infante-Moro et al., 2019) and the competencies known as soft skills (Laguna-Sánchez et al., 2020) - specifically problem-solving, teamworking, adaptability, communication, leadership, and creativity competencies (Sánchez-Ramírez et al., 2022) – are classed as employability skills. To foster the development of these competences in students, we proposed teaching activities based on active methodologies (project-based learning, problem-based learning, collaborative learning), as recommended by Martin et al. (2021) and Romero-García et al. (2020), as well as the use of digital environments for training and evaluation activities. This involved providing guidance and support to the teachers of the groups of students selected for this study.

To test the effectiveness of the educational intervention that set out to develop employability skills in students, we took measurements before and after the training. Reliable and valid instruments were used, both for measuring digital competences (Marcano et al., 2020) and for problem-solving, teamwork, adaptive capacity, communication, leadership and creativity competencies (Sánchez-Ramírez et al., 2022). Both aspects were combined in a single instrument that the teachers applied to evaluate the competencies of the students. This validated assessment instrument can be considered a contribution for other researchers, however it can be long and tedious to apply due to the number of items it contains. On the other hand, the part related to digital competencies is focused on the INTEF, 2017 model, which has changed. In this sense, for new studies it is proposed to update the instrument and also to contrast it with others such as those used by Kumar, (2022) and Rashidi et al (2022).

Regarding the results of the digital competencies, a significant change is apparent in their level of development in all the subareas with high or very high effect sizes. The area with the least effect was Interaction using digital technologies. This could be because this competency is more developed in students owing to everyday use and practice through social media networks and their personal profiles, which agrees with the results of Marcano et al. (2020). These results allow us to confirm H1 which indicated that the training program applied on the FP campus positively affects the development of digital competencies of trainees.

This provides evidence for the training strategies aimed at improving digital competencies that the teachers implemented in the course: use of the *Google Workspace for Education* digital environment was conducive for the practices that resulted in increased digital competencies, especially Communication and Online Collaboration and Digital content creation, and which agrees with the results of Oliynyk et al. (2021); activities that put into practice the digital competencies described in the indicators for each subarea of the digital competency, which are specified in the INTEF model (2017), were also effective and were taken as a guide and reference in this study was done by Martin et al. (2021) and Romero-García et al. (2020). These studies and other research have shown that doing practical activities using active methodologies are the most effective way to acquire and develop digital competencies (Marcano, et al., 2020, Laguna-Sánchez et al., 2020; ; Martono et al., 2020). This competency development favors the employability of students and future graduates, as stated by Di Gregorio, et al., (2019) and Infante-Moro, et al. (2019); Picatoste et al. (2018); and Pirezada and Khan (2013). Although other factors that may affect job satisfaction and condition employability should

also be considered as noted by Aman-Ullah et al. (2022a), Aman-Ullah et al. (2022b), Aman-Ullah et al. (2022c), Aman-Ullah et al. (2023) and Mohd Zin et al. (2023). It would be advisable to take these factors into account in order to broaden our line of research and refine training in educational centers.

In the case of soft skills, we observed significant changes in the initial and final measurements for all of the competencies with a very large effect. This reaffirmed the validity both intervention programs for improving these competencies. The activities for exercising decision making, solving problems, being able to communicate and adapting to challenging situations that arise possibly contributed to this improvement in these competencies. The positive results match those obtained by Martono, et al. (2020); Oliveira et al. (2020) and Supriyanto, et al. (2020). And they also allow us to confirm H2, which indicated that the training program would have positive effects on the development of these competencies.

In this study, both digital competencies and soft skills are addressed during the entire academic year, which can be considered as a greater research contribution compared to that of Zouali et al (2023), since only three competencies are addressed and in less time (one month); however, given the particularity of each case, it is not known which of the two intervention programs is more effective, but both provide data for the researchers.

In addition to consider the effects of the training intervention in more depth, we analyzed the differences between male and female students. We found that the effects were the same for both groups and we did not find differences in any of the competencies. This contrasts with the results of Pérez-Escoda et al. (2021), and so we can state that the training program has a distinctive and inclusive character because it makes it possible to overcome the gender gap regarding digital competencies and soft skills.

CONCLUSIONS

We can conclude that the program that is applied and evaluated in this study was effective in developing the employability skills of the participating students. As it is suggested in literature, implementation of active methodologies favored the acquisition of digital competencies. More detailed analyses should be done to consider the cases of students for whom the program has had less effect and compare them with those where it had the most effect in order to find possible intervening factors such as aptitude for learning, level of development of the digital and soft-skill competencies, the effects of the teacher, the profile according to what the students are studying, and other variables. At this point it should be noted that thanks to all this experience initiated before the pandemic by COVID-19, the Campus FP institution was able to provide an effective and immediate response to the digitalization situation required by the pandemic. Both teachers and students had developed digital competencies that were necessary to continue with the educational activities. In addition, this is a study that is considered valid even though the reference framework used has been renewed (INTEF,2017), emphasizing the indicators for the development of digital competencies in students (Resolución del 4 de mayo, 2022). For further studies, we suggest using the new framework for digital skills, also considering AI skills for training and employment.

In terms of the impact of this programme, it can be highlighted that it has now been generalised for all the educational centres and departments of the organisation. Teachers have incorporated in their practice the orientation and development of employability skills and abilities that are naturally integrated into the curriculum. For the students, the development of these competences implies an approach to the world of work, as they can show evidence of achievement that is demanded by the companies themselves demand. Furthermore, this project facilitated the organisation's participation in the European project funded by the Erasmus+ Programme, called PRODISK (<https://prodisk.eu/>).

The main outcome of the PRODISK project is a digital Learning Environment aimed at VET teachers and students. The learning environment includes a course in e-learning format for the acquisition and assessment of digital competences, and specific resources for the systematic practice of these digital competences with a view to certifying their acquisition.

The limitations of this study center on the scope of its conclusions, as it concentrates on one particular sample of professional-training students (CampusFP). Although this is a case study focused on one center, the sample is representative of the population, so the conclusions obtained are relevant to Campusfp. In fact, this model has been systematized in this institution. It is applied in all the training cycles taught in this vocational education center. However, its generalization requires the application of the study to other vocational training centers and the purpose is to export and evaluate it. These students might be more inclined to embrace training in employability skills more positively than students from other educational levels given that they are very close to heading out into the world of work. Furthermore, the applicability of the program to the development of these competencies at universities, from which a large volume of potential employees come, could be less effective. A positive attitude from university teachers and students would be necessary. Despite all the limitations of generalization of results, we consider that this study can be considered a contribution to research in this line, as do Rashidi et al (2022), Zouali et al (2023) among others, and inspire new research to improve on the limitations described here.

We recommend replicating the implementation of this program with new groups of students in the same professional-training institution and checking that the positive effects on the development of the competencies in question are maintained. It would also be advisable to monitor the students who receive the intervention to establish their rates of employability compared with other graduates from the same training center who have not received training in employability skills. Likewise, extending the program to on-the-job training and orientation as proposed by Padgett and Donald (2023) can strengthen the effects of the program. In addition, given the instruments presented and previously validated, it would be interesting to develop a self-assessment tool for digital competence and soft skills. The use of artificial intelligence would be advisable in this case to provide students with feedback and suggestions for improvement.

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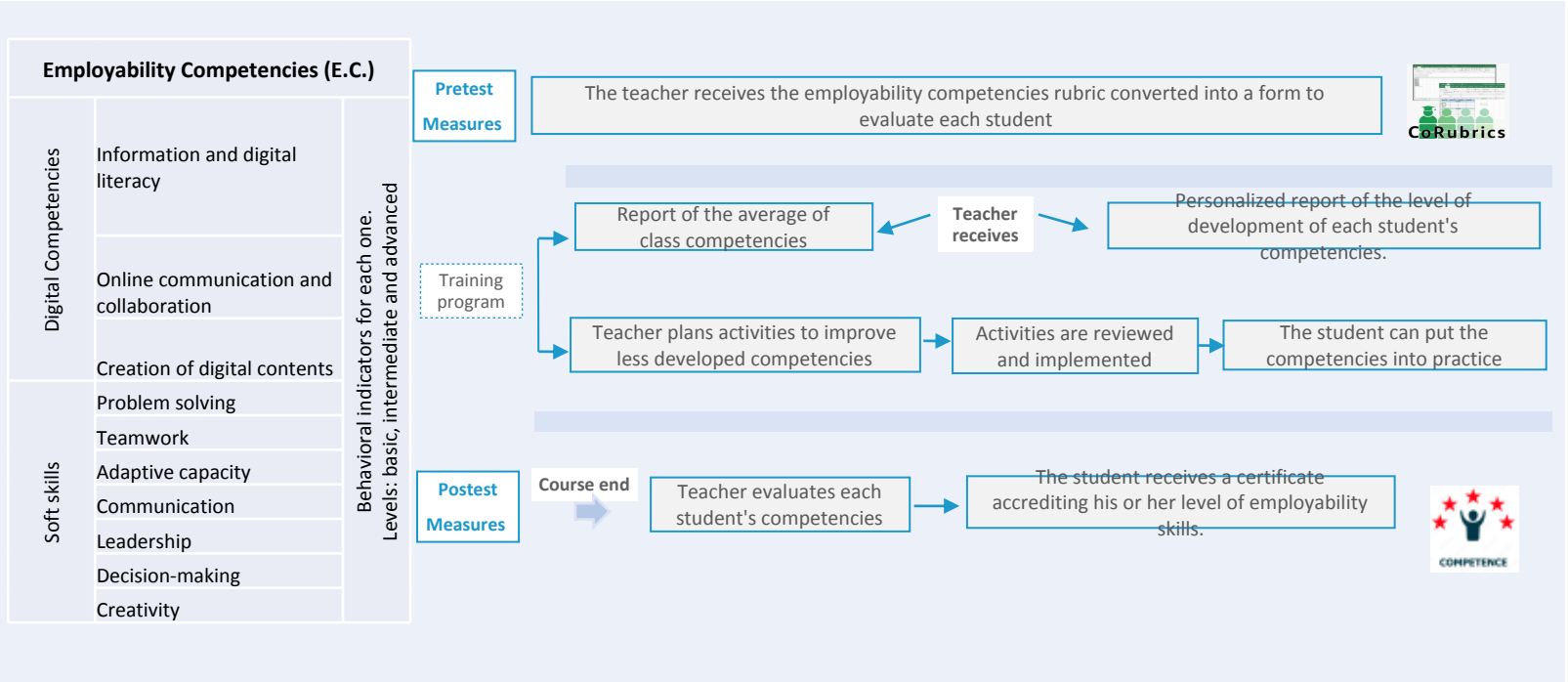
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Education + Training

Figure 1. Framework for the development of employability competencies at Campus FP



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Table 1. Descriptive statistics of the digital competency areas.

| | | Pretest | | Posttest | |
|--|---|---------|-------|----------|-------|
| | | Mean | SD | Mean | SD |
| Information and digital literacy | Navigation, search and filtering of information | 2.24 | 0.656 | 2.66 | 0.577 |
| | Evaluating data, information and digital content | 2.21 | 0.658 | 2.57 | 0.609 |
| | Managing and retrieval of data, information and digital content | 1.96 | 0.94 | 2.58 | 0.634 |
| Communication and online collaboration | Interaction using digital technologies | 1.52 | 1.075 | 2.19 | 0.935 |
| | Sharing through digital technologies | 1.69 | 1.131 | 2.72 | 0.453 |
| | Collaborating through digital technologies | 1.84 | 0.955 | 2.48 | 0.767 |
| Digital content creation | Digital content development | 1.81 | 0.949 | 2.46 | 0.583 |
| | Copyright and licenses | 1.61 | 0.899 | 2.32 | 0.669 |

Table 2. Result of the comparison with the Wilcoxon test for digital competency.

| Area | Subarea | Neg./Pos./Ties | N | Average Rank | Sum of Ranks | z | p | r | |
|-------------------------------|---|---|------|--------------|--------------|--------|--------|-------|------|
| Information and Data Literacy | Navigation, search and filtering of information | Neg. | 1 | 19.5 | 19.5 | -6.041 | 0.000 | 0.961 | |
| | | Pos. | 43 | 22.57 | 970.5 | | | | |
| | | Ties | 70 | | | | | | |
| | Evaluating information | Neg. | 1 | 16 | 16 | -5.465 | 0.000 | 0.954 | |
| | | Pos. | 36 | 19.08 | 687 | | | | |
| | | Ties | 77 | | | | | | |
| | Online communication and collaboration | Managing and retrieval of data, information and digital content | Neg. | 0 | 0 | 0 | -5.938 | 0.000 | 1 |
| | | | Pos. | 39 | 20 | 780 | | | |
| | | | Ties | 65 | | | | | |
| | | Interaction using digital technologies | Neg. | 6 | 14.5 | 87 | -3.611 | 0.000 | 0.67 |
| Pos. | | | 26 | 16.96 | 441 | | | | |
| Ties | | | 58 | | | | | | |
| Digital content creation | Sharing through digital technologies | Neg. | 0 | 0 | 0 | -4.866 | 0.000 | 1 | |
| | | Pos. | 27 | 14 | 378 | | | | |
| | | Ties | 44 | | | | | | |
| | Collaboration using digital technologies | Neg. | 7 | 18 | 126 | -5.506 | 0.000 | 0.83 | |
| | | Pos. | 47 | 28.91 | 1359 | | | | |
| | | Ties | 60 | | | | | | |
| Digital content creation | Digital content development | Neg. | 4 | 23 | 90 | -6.459 | 0.000 | 0.903 | |
| | | Pos. | 57 | 31.56 | 1799 | | | | |
| | | Ties | 53 | | | | | | |
| | Copyright and Licensing | Neg. | 6 | 30 | 180 | -7.071 | 0.000 | 0.877 | |
| | | Pos. | 70 | 39.23 | 2746 | | | | |
| | | Ties | 38 | | | | | | |

Table 3. Descriptive statistics for soft skills.

| Soft Skills | Pretest | | Posttest | |
|-----------------|-------------|-------|-------------|-------|
| | Mean | SD | Mean | SD |
| Problem solving | 1.82 | 0.767 | 2.33 | 0.783 |
| Team work | 2.01 | 0.793 | 2.46 | 0.719 |
| Adaptability | 1.85 | 0.79 | 2.32 | 0.813 |
| Communication | 1.82 | 0.779 | 2.33 | 0.76 |
| Leadership | 1.75 | 0.762 | 2.23 | 0.831 |
| Decision making | 1.89 | 0.824 | 2.25 | 0.829 |
| Creativity | 1.96 | 0.813 | 2.33 | 0.838 |

Education + Training

Table 4. Result of the comparison with the Wilcoxon test for soft skills.

| Soft skills | Neg./Pos./Ties | <i>N</i> | Average Rank | Sum of Ranks | <i>z</i> | <i>p</i> | <i>r</i> |
|-----------------|----------------|----------|--------------|--------------|----------|----------|----------|
| Problem solving | Neg. | 3 | 25.5 | 76.5 | -6.52 | 0.000 | 0.907 |
| | Pos. | 54 | 29.19 | 1576.5 | | | |
| | Ties | 57 | | | | | |
| Team work | Neg. | 2 | 23.5 | 47 | -6.37 | 0.000 | 0.929 |
| | Pos. | 49 | 26.1 | 1279 | | | |
| | Ties | 63 | | | | | |
| Adaptability | Neg. | 6 | 27 | 162 | -6.015 | 0.000 | 0.817 |
| | Pos. | 53 | 30.34 | 1608 | | | |
| | Ties | 55 | | | | | |
| Communication | Neg. | 4 | 27.5 | 110 | -6.536 | 0.000 | 0.88 |
| | Pos. | 56 | 30.71 | 1720 | | | |
| | Ties | 54 | | | | | |
| Leadership | Neg. | 2 | 25 | 50 | -6.592 | 0.000 | 0.933 |
| | Pos. | 52 | 27.6 | 1435 | | | |
| | Ties | 60 | | | | | |
| Decision making | Neg. | 5 | 20 | 100 | -5.135 | 0.000 | 0.807 |
| | Pos. | 40 | 23.38 | 935 | | | |
| | Ties | 69 | | | | | |
| Creativity | Neg. | 4 | 23 | 92 | -5.687 | 0.000 | 0.844 |
| | Pos. | 44 | 24.64 | 1084 | | | |
| | Ties | 66 | | | | | |

Appedix 1. Soft skills rubric

Problem Solving

| Level | Definition | Related Behaviours |
|------------------|---|---|
| A (basic) | Identify and understand the problems | Recognises the problems that arise in class. |
| | | Focuses only on those aspects that directly affect him/her. |
| B (Intermediate) | Analyses and solves problems | Makes good decisions in the face of unforeseen events, in order to achieve specific objectives. |
| | | Seeks different solutions. |
| C (Advanced) | Anticipates problematic situations and solves complex problems. | Provides new ways of solving a problem. |
| | | Is fluent in solving complex problems. |

Team Work

| Level | Definition | Related Behaviours |
|------------------|----------------------------------|--|
| A (basic) | Collaborates when asked to do so | Brings new ideas and thoughts to the group. |
| | | Collaborates with the rest of the team in order to achieve common goals. |
| | | Shares necessary information with the group to accomplish tasks. |
| B (Intermediate) | Is involved in the team. | Offers help to other members of his/her group when he/she sees that they are overloaded. |
| | | Is involved in class discussions, preparing for them, contributing ideas, respecting the opinions and ideas of his/her classmates. |
| | | Is able to give up personal goals in favour of group goals. |
| | | Does what the rest of the group expects of him/her in a timely and high-quality manner. |

| | | |
|--------------|----------------------------|---|
| C (Advanced) | Works for team cooperation | Motivates colleagues by giving them credit. |
| | | Adopts different roles within his/her team. |
| | | Acts in a conciliatory manner when differences of opinion arise between team members. |
| | | Shares both success and failure in teamwork. |
| | | Promotes cooperation with other teams. |

Adaptative capacity

| Level | Definition | Related Behaviours |
|------------------|--------------------------------|---|
| A (basic) | Adapts and assimilates changes | When you need to achieve a result you are able to analyse several options. |
| | | Integrates easily in different work groups. |
| | | Takes on change as a challenge. |
| B (Intermediate) | Contributes to change | Finds it easy to change the way he/she works to achieve his/her goals as a learner. |
| | | Proposes different solutions to solve a problem. |
| C (Advanced) | Promotes and manages change | Is able to manage change in various activities as well as support colleagues. |
| | | Promotes change in various activities |
| | | Can develop new approaches by integrating internal and external views. |

Communication

| Level | Definition | Related Behaviours |
|-----------|--------------------------------------|--|
| A (basic) | Transmits verbal or written informat | Can deliver clear, orderly messages. |
| | | Can structure messages logically. |
| | | Can attract and hold the attention of peers or teachers. |

| | | |
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| B (Intermediate) | Communicates, is a good listener and receptive listener. | Can convey well complex ideas, information or instructions. |
| | | S/he spends the right amount of time in his/her presentations. |
| C (Advanced) | Can communicate effectively in particularly complex situations. | Can receive feedback from colleagues or teachers and take this into account when preparing future presentations. |
| | | Can deliver high impact public presentations. |
| | | Can adapt his/her presentation style to people from different cultures and countries. |
| | | Can convince others with his/her speech, proposal or project.. |

Leadership

| Level | Definition | Related Behaviours |
|------------------|--|---|
| A (basic) | Coordinates and directs the team's activity | Ensures that team members work within the appropriate guidelines. |
| | | Assigns responsibilities to team members according to their capabilities. |
| | | Informs colleagues of decisions that may affect them. |
| | | Creates a positive atmosphere in the group. |
| B (Intermediate) | Contributes to improving the performance and development of his/her team | Delegates according to the abilities of his/her team members. |
| | | Gives both positive and negative feedback to colleagues. |
| | | Facilitates the participation of colleagues in decision making. |
| | | Develops a cooperative environment. |
| | | Takes responsibility for both successes and mistakes of the team. |

| | | |
|--------------|-----------------------|---|
| | | Provides appropriate support, advice and communication to improve performance. |
| C (Advanced) | Manages complex teams | Successfully manages complex and heterogeneous work groups. |
| | | Works with his/her team to solve problems in a timely manner. |
| | | Adopts different leadership styles depending on the maturity level of his/her team members. |
| | | Makes sure that divergent opinions or positions are listened to and respected. |
| | | Gains commitment from different points of view in the decisions taken. |

Decision making

| Level | Definition | Related Behaviours |
|------------------|---|---|
| A (basic) | Makes supported decisions without carrying out specific criteria | Consults with teacher to make decisions. |
| | | Does not question the criteria used to implement an issue prior to making a decision. |
| | | Makes emotionally motivated decisions, being more impulsive than rational. |
| B (Intermediate) | Makes decisions judiciously when presented with alternatives | Makes fair decisions when faced with a choice between alternative solutions to a problem. |
| | | Considers all the factors of the alternatives. |
| C (Advanced) | Chooses the most appropriate option in anticipation of consequences | Anticipates events in order to make decisions. |
| | | Minimises the emotional burden of sensitive decisions. |
| | | Chooses the most appropriate option in a justified way. |

Creativity

| Level | Definition | Related Behaviours |
|------------------|---|---|
| A (basic) | Has concerns and takes a global view | Has curiosity and interest in discovering and learning new things. |
| | | Can visualise situations from different points of view. |
| | | Analyses own ideas with the aim of maximising and improving results. |
| B (Intermediate) | Generates ideas fluently | Uses different techniques to create ideas (e.g. brainstorming, generating questions, associating...). |
| | | With little information or material can create new ideas or objects. |
| C (Advanced) | Redefines and creates original ideas for a specific purpose | Demonstrates originality and inventiveness in individual or group work. |
| | | Likes and can easily implement new ideas or new projects. |
| | | Is able to redefine ideas for new purposes. |

Appendix 2. Digital literacy rubric

Area 1. Information and digital literacy

1.1. Navigation search and filtering of information

| Level | Related Behaviours |
|------------------|---|
| A (basic) | Can identify websites, blogs and digital databases to search for literature on the job-related topic. |
| | Can identify literature on the topic of the job in these websites, blogs or digital databases, and access and browse them. |
| | Using a list of generic keywords and tags available in your digital textbook you can identify those that would be useful for finding literature on the topic of the paper. |
| B (Intermediate) | Can use precise keywords to find sources of information in websites, blogs and digital databases, and explain how he/she accesses and navigates the results he/she finds. |
| | Can respond to any issues while doing these activities. For example, you can add new keywords and tags to your strategic personal search, if you cannot find appropriate resources related to the topic of your work. |

| | |
|--------------|--|
| C (Advanced) | Can show classmates how to find websites, blogs and digital databases with information for their assignments. |
| | Can find websites, blogs and digital databases adapted to his/her and other people's needs and differentiate between appropriate and inappropriate digital resources, pop-up information or spam while browsing. |
| | Can explain how he/she executes these searches, and overcome unexpected situations that arise in the digital environment (e.g. needing a username to access files in a digital library) to find information for writing his/her paper. |
| | Can offer help to peers by highlighting his/her personal strategy in finding the most appropriate information on websites, blogs and digital databases, including examples of how he/she can overcome the complexity of situations that arise while browsing these digital resources (e.g. if he/she cannot find enough information, useless information,...). |

1.2. Evaluating data, information and digital content

| Level | Related Behaviours |
|------------------|---|
| A (basic) | Is able to identify from a list of blogs and databases that appear in his/her class syllabus those that are commonly used because they are reliable and reputable. |
| B (Intermediate) | Can critically analyse the reliability and trustworthiness of sources of information, data and digital content. |
| C (Advanced) | Can use his/her knowledge to contribute to practice and guide peers in analysing and assessing the reliability and trustworthiness of data, information and digital content from his/her sources. |
| | Can propose solutions to complex problems related to the analysis and evaluation of the reliability and trustworthiness of data, information and digital content in digital environments. |
| | Proposes new ideas to the class on how to assess the reliability and trustworthiness of the information sources they use for studies. |

1.3. Managing and retrieval of data, information and digital content

| Level | Related Behaviours |
|------------------|---|
| A (basic) | Understands how information is stored on different devices (hard disk, external memory...) to be used for learning. |
| B (Intermediate) | Can select data, information and content from various websites or databases to assist in learning. |
| | Organises the selected content for later retrieval and use (updates his/her files and resources, makes back-up copies, etc.). |
| | Can develop a strategy for organising educational resources so that he/she can refer to them in the future if needed. |

| | |
|--------------|--|
| C (Advanced) | Can use applications and extensions installed in his/her browser to tag and store educational resources. |
| | Uses cloud storage services through which they share files and resources with their peers. |
| | Has both a local and online storage strategy that can be shared with peers or teachers. |
| | Combines the various technologies for the transfer of educational files. |

Area 2. Communication and online collaboration

2.1. Interaction using digital technologies

| Level | Related Behaviours |
|------------------|--|
| A (basic) | Can select simple digital technologies with which to interact in class. |
| | Identifies simple means of communication such as email or certain social networks in the educational community to which he/she belongs. |
| B (Intermediate) | Can use regular chat rooms (e.g. facebook messenger or WhatsApp) to talk to classmates and organise group work. |
| | Can choose other means of digital communication (e.g. class forum) on devices used in class which can be useful for discussing details of organising class work. |
| | Can troubleshoot problems such as adding or deleting members of the group chat. |
| C (Advanced) | Can show others the media that are appropriate for each classroom context and for each target audience, both in real time and delayed. |
| | Can adapt different digital technologies for the most appropriate interaction for the target audience. |
| | Can adapt the most appropriate means of communication for each class project. |

2.2. Sharing through digital technologies

| Level | Related Behaviours |
|------------------|--|
| A (basic) | Uses the Internet to access information and educational resources that other classmates and teachers share with him/her. |
| | Can recognise simple digital technologies suitable for sharing information and educational content resources with his/her teachers and classmates via the web. |
| B (Intermediate) | Can use the specific communication mechanisms in the social networks in which he/she participates to enhance and share his/her learning. |
| | Can access applications for educational purposes and share them with peers. |
| | Can use appropriate digital technologies to share data, information and digital content. |

| | |
|--------------|--|
| | Is able to take into account the information and content shared through digital technologies depending on the recipient. |
| | Can cite reference sources correctly. |
| C (Advanced) | Creates online files and documents and shares them digitally with teachers and learners by giving different user roles (editing, reading, commenting). |
| | Is able to show other classmates how to share information and content through digital technologies. |
| | Can select the most appropriate digital technologies for sharing information and content. |
| | Can adapt his/her role as an intermediary in sharing digital content. |
| | Can cite reference sources correctly in different formats. |

2.4. Collaborating through digital technologies

| Level | Related Behaviours |
|------------------|---|
| A (basic) | Can choose basic digital tools and technologies for collaborative processes such as file sharing or the creation of shared documents. |
| | Can easily access collaborative documents in online spaces and applications used for studying. |
| B (Intermediate) | Participates in online shared spaces or documents to which he/she is invited to study (e.g. adds comments as part of group work). |
| | Uses shared web spaces both as creator and/or editor for work with his/her class group. |
| C (Advanced) | Can propose different tools than those commonly used in class for collaborative processes. |
| | Can also differentiate between suitable and unsuitable digital resources for working in digital environments together with peers. |
| | Can overcome unexpected situations that arise in digital environments while creating data and/or content. For example, if a file is not saving changes made by other classmates or if a classmate does not know how to upload a file to the digital tool. |

Area 3. Digital content creation

3.1. Digital content development

| Level | Related Behaviours |
|-----------|--|
| A (basic) | Identifies tools for editing digital content and presenting it in a detailed and orderly manner to peers and teachers. |
| | Creates a presentation with basic slides without multimedia content. |

| | |
|------------------|--|
| B (Intermediate) | Creates and edits all kinds of text files and presentations in class activities with multimedia content. |
| | Has a blog or personal online space where he/she publishes text files, videos and presentations throughout the course in which the teacher and other classmates can participate. |
| C (Advanced) | Can design digital materials using concept maps, podcasts or videos. |
| | Encourages peers to create digital learning materials involving the design and editing of texts, presentations, videos and audios. |
| | Can identify the most appropriate formats for editing content. |
| | Adapts the way of expressing him/herself to the creation of more appropriate digital media. |

3.2. Copyright and licenses

| Level | Related Behaviours |
|------------------|---|
| A (basic) | Is aware that the information, applications, audiovisuals or any other digital product they use must respect copyright. |
| | Considers any kind of plagiarism or illegal use of digital content to be reprehensible. |
| | Respects copyright both for accessing and downloading files. |
| B (Intermediate) | Can identify the symbol that indicates whether an image is protected under a Creative Commons licence and therefore do not use it without the author's permission. |
| | When using digital content from another author for class work, respects the licence and cites the source correctly. |
| | Knows the basic differences between open and proprietary licences and how they affect digital content. |
| C (Advanced) | Knows the differences between open and proprietary licences, as well as the types of Creative Commons, copyright and copyleft licences, and applies them to class work. |
| | Can select the most appropriate rules applying to copyright and licensing of data, information and digital content. |
| | Uses his/her knowledge to guide others in the application of copyright and copyright licences. |

Modifications of the article according to the recommendations of the reviewers.

Contribution title: ET-11-2022-0435.R3

While I appreciate the amendments made I do not feel they go far enough. In my view, the literature review requires more depth and breadth and arguably would benefit from being separate from the introduction. The methodology requires some further thought particularly around the case study approach given the authors have a limited sample size. The discussion needs to underline significance and be more emotive in the drawing of the conclusions. Good luck with your revisions.

Reviewer: 1

A full stop has been deleted. So the reference that seemed to be missing is included.

Reviewer: 2

Recommendation: Minor Revision

Comments:

Thank you for providing revisions to the paper. I appreciate the amendments that have been made but feel two issues remain. If the limitations and mitigation of limitations could be discussed only in the conclusion section, leaving the discussion section to clearly derive meaning. If some additional commentary on implications could be added this would be great. Thank you

| | |
|--|-----------|
| <p>1. Originality: Does the paper contain new and significant information adequate to justify publication?: There is a contribution and enough information contained in the paper to justify publication.</p> | <p>OK</p> |
| <p>2. Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: Previous comments relating to the depth and breadth of</p> | <p>OK</p> |

| | |
|--|--|
| <p>the literature review have been addressed with new text and sources added.</p> | |
| <p>3. Methodology: Is the paper's argument built on an appropriate base of theory, concepts, or other ideas? Has the research or equivalent intellectual work on which the paper is based been well designed? Are the methods employed appropriate?: I still find the sample size a little limited to provide meaningful conclusions but further justification has been provided on the previous round of revisions. With regards the case study approach, additional justification has been provided.</p> | <p>OK. A new sentence about justification of case study has been added.</p> |
| <p>4. Results: Are results presented clearly and analysed appropriately? Do the conclusions adequately tie together the other elements of the paper?: The discussion has been added to. But I note discussion of the limitations has been included in the discussion section and should rather be included in the conclusion section. Could the limitations and mitigation of these limitations be pulled together to reside only in the conclusion section please?</p> | <p>Thank you for the suggestion, we have checked that the limitation set out in the discussion is already included at the end of the conclusions, so we have proceeded to delete that paragraph. We also have reorganized conclusions and we have added a new forecast</p> |
| <p>5. Practicality and/or Research implications: Does the paper identify clearly any implications for practice and/or further research? Are these implications consistent with the findings and conclusions of the paper?: The research</p> | <p>Considering the results presented in this work, and the instruments previously developed and validated for data collection, it would be of interest to develop an AI tool that would allow for an automatic self-assessment of CD and SS with feedback.</p> |

| | |
|---|-----------|
| <p>1 2 3 4 5 6 7 8 9 10 11 12</p> <p>implications have been mentioned, they could be expanded upon and given there are some further revisions for the authors to do, they may consider extending discussion of practical implications.</p> | |
| <p>13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31</p> <p>6. Quality of Communication: Does the paper clearly express its case, measured against the technical language of the field and the expected knowledge of the journal's readership? Has attention been paid to the clarity of expression and readability, such as sentence structure, jargon use, acronyms, etc.: This is generally fine, the authors make themselves understood.</p> | <p>OK</p> |

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