

SUMMARY REPORT

4.2 Testing and validating the e-Toolkit,



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1. INTRODUCTION

1.1. Rationale and aim of the output

1. Activities 4.2 were embedded into Output 4. The purpose of Output 4 was to achieve the development and testing of an open-access web-based e-learning Toolkit (e-Tollkit) to improve the digital competence of teachers and mobility students. The Toolkit will provide innovation focusing on course creation, quality enhancement, using technology-enhanced teaching (in the way of Online Distance learning) and improving digital competencies. Additionally, it aims to support teachers in digital course development and decreases development time and costs for organizations in course development. This web-based e-learning Toolkit will offer students better open and distance learning courses and enhance their learning success.

Activity 4.2 aims to define the digital competence level of all students and educators before and after the course.

1.2. Aim and objectives of the review

This activity focused on developing students' and teachers' digital competence levels during an International Week event using an e-toolkit. More specifically, our research question is:

- What was the impact of the e-ToolKit on the students' and teachers' perception of their digital competencies in the context of International Week?

2. Literature review

International mobility teaching more commonly occurs during a week of interactive lectures and workshops on digital and non-digital environments to allow participants to develop functional competencies during their international careers (Mikhaylov, 2014; Stoltenberg et al., 2017). Apart from the students, educators can benefit from such international events to enhance their digital competencies, learn new methodologies regarding teaching practices and share knowledge and experiences with colleagues from other countries (Ciftci & Karaman, 2018; Withers et al., 2019). Additionally, conducting these events in a hybrid way and focusing on improving their digital competencies is paramount to both teachers and students as the high cost of travelling to such venues, especially if they are on different continents, can be discouraging to carry out (Jacobs et al., 2014; Schartner, 2016). However, even in the case of countries within the European Union, i.e. Western Balkan countries, these costs can hinder the ability of students and academics to join these events (Klemenčič & Zgaga, 2014).

The difficulties and challenges they face and how they respond to and interact with these new academic environments and teaching methods are not apparent, especially in pre-test and post-test set-ups (Patelarou et al., 2022).

Numerous advantages of participating in short-term mobility programs have been emphasized by researchers, which encompass cultural, personal, and employment/career outcomes (Kratz & Netz, 2016; Kronholz & Osborn, 2016). Previous research has identified a range of beneficial effects associated with participating in short-term international mobility programs, such as professional development, personal growth, intercultural competence, cross-cultural communication skills, language proficiency, cultural adaptability, cultural sensitivity and empathy, global mindedness, cultural intelligence, as well as professional identity development (Roy et al., 2019).

Moreover, digital competencies are vital in all stages of today's information-driven society, whether for learning, working, or socializing. This was more evident in the workplace during the pandemic, where employees were required to become more flexible in work options and, in some cases, work entirely from home (Yang & Hong, 2021). As the crisis caused by the pandemic led to increased online time, and the need for both physical and digital workplaces grew, the need to find a way and develop and evaluate digital competencies emerged too. As such, universities have the responsibility to adapt to various situations and meet the needs of employers and future workers by helping them develop their skills in utilizing their own devices, working from home entirely or in a hybrid way (Yang et al., 2021; Haningsih & Rohmi, 2022).

3. Methodology

This quantitative occurred during an International Week in January 2023 in Heraklion, Crete, Greece. This study investigates the effect of using the digital e-toolkit during International Week workshops. Specifically, we explored the effect it had on digital competence. The workshops were designed based on the digital e-toolkit and the flipped-learning approach.

We conducted a semi-experimental design with a convenience sample following an approach and a robust ethical protocol (Petousi & Sifaki, 2020). Specifically, we evaluated the effect on digital competencies using pre-test and post-test questionnaires. This design aimed to clarify the background knowledge and level of the participants' digital competencies and afterwards showcase the effect the workshops had on them, something that only some studies on mobility teaching have researched (Patelarou et al., 2022). However, because the needs of international students and teachers in higher education are different since teachers' primary focus on digital tools is their use in learning (Holmes et al., 2018), we created an additional questionnaire solely for the teachers and the development of digital competencies for teaching. The questionnaires were created based on (Holmes et al., 2018; Galindo-Domínguez & Bezanilla, 2021) and adapted to our study.

The data that was gathered from the questionnaires regarding digital competencies were analyzed with the use of the statistical analysis tool SPSS. The participants in this research study differed with each research tool as the data collection tools were given via an online platform. The sample size of the digital competence questionnaire was 33.

Additionally, the Likert-scale questionnaire was also analyzed with the use of the same analysis tool. Following the suggestions of Cohen et al. (2018), discussions were conducted among the researchers while analyzing, grouping facts and statistics, and creating consensus on our results, thus increasing the reliability of our findings.

4. Results

The data collected were coded and analyzed based on their methodology. The findings presented below are distributed based on the research questions. As such, we will present the quantitative data from the pre and post-test digital competence questionnaire to answer our research question.

4.1 Digital Competences

To address the initial inquiry, we employed pre-test and post-test questionnaires. We scrutinized the information using the paired-samples t-test to compare the averages of two evaluations gathered from a group. As seen from table 1, the students' and teachers' perception of their digital competence (50 questions) was assessed over five competency areas. Each of these areas included some sub-dimensions. The five competency areas were: Information and data literacy (16 questions), communication and collaboration (15 questions), digital content creation (10 questions), safety (6 questions), and problem-solving (4 questions). This questionnaire graded all questions on a Likert-type scale of 1 to 5.

Table 1. Information and data literacy dimension in Digital competence questionnaire

Dimension	Questions	Mean difference	Std Deviation	A significant difference (sd<,05)
Information and data literacy	I can configure the web browser of my computer when it is considered necessary.	,06250	1,43544	,807
	I can select sources of information of professional interest.	,03030	,58549	,768
	I can locate digitized information using keywords and filters to refine and limit my search.	,33333	1,10868	,094
	I can use different search engines to locate information and resources for my mobility.	,06061	1,22320	,778
	I am aware of the restrictions on educational resources published with copyright.	,28125	1,37335	,256
	I can use educational resources available on the internet depending on the demands that the subjects pose to me.	,27273	1,12563	,174
I can critically evaluate the information I locate on the internet.	,06061	,93339	,712	

	I am confident in my capability to apply digital technologies to increase my learning effectiveness and efficiency	-,09091	1,10010	,638
	I regularly reflect on my practice in digitally enhanced learning and look for the potential for improvement.	,00000	1,04727	1,000
	I can find solutions to any challenges that emerge in digitally enhanced learning.	,00000	1,29904	1,000
	I am comfortable with reading screen-based texts with concentration and persistence.	-,06250	1,36636	,798
	I am comfortable with digitally enhanced learning.	,09091	1,10010	,638
	I can save information in different formats and classify it to retrieve it quickly.	-,06061	1,41287	,807
	I can make backup copies of the information that I consider relevant.	-,06250	1,38977	,801
	I can use external storage spaces.	-,06250	1,41279	,804
	I can decide on the digital technologies that are most relevant and appropriate for my study among a variety of options.	-,09091	1,15552	,654
	I can use at least three different digital tools to interact with others.	-,18750	1,53323	,494
	When I browse, I can interact with different sources of digital information.	-,15625	1,19432	,465
	When I share information or content obtained online, I cite the author and the source, following the existing rules.	,06250	1,21649	,773
Communication and collaboration	I can select to share on the network, news, and resources on various web pages, forums, and other online communities.	,03226	1,01600	,861
	I can use programs and applications to create projectable, digital presentations.	-,09375	1,27910	,681
	I can spread the digital presentations created through mailing, social networks, uploading to repositories, etc.	-,25000	1,21814	,255
	I can actively participate in at least two virtual communities and social networks.	-,06250	1,41279	,804
	I can take advantage of digital media's possibilities, including social networks.	-,09375	1,22762	,669

I can use online collaborative work tools to create shared knowledge.	-,09375	1,35264	,698
I am fully aware of the legal and ethical issues with digital technologies.	-,60606	1,14399	,005
I am fully aware of digital resources' legal and ethical issues.	-,54545	1,14812	,010
I comply with the legal regulations regulating such information transfer when I send and receive digital messages.	,12121	1,40885	,625
I can remember the sociocultural characteristics of the audiences I direct my digital messages.	,06250	1,29359	,786
I can manage my digital identity, making only the personal data I want to be known publicly.	,00000	1,43684	1,000
I can track my digital history.	,00000	1,48556	1,000

Based on Table 1, the participants did not show any significant difference in the first two content areas, Information and data literacy and communication and collaboration, apart from 2 questions in the second content area. However, in both content areas, the participants' mean scores are way above average, as most questions have a mean score of 4 (M=4.00) or higher, even before the event. Especially on the sub-dimension of browsing, searching, and filtering data, information, and digital content, which included the first four questions, participants showed highly high scores. The only questions that showed interesting differences before and after the event were about the legal and ethical issues of using digital technologies and digital resources. Although the students and teachers showed some understanding of the legal and ethical issues associated with digital content (M=3,683 & M=3,634), their comprehension of these subjects showed improvement (M=4 & M=3,97). Nevertheless, the high scores in most of the pre-test questionnaire on the first two content areas indicate that the participants already consider themselves quite skilled in these areas, especially in the first sub-dimension.

Table 2. Digital content creation, safety and problem-solving dimensions in Digital competence questionnaire

Dimensi	Questions	Mean difference	Std Deviation	A significant difference (sd<,05)
	I can share simple digital materials on the web.	-,75000	1,27000	,002

	I can manage web spaces where I can publish multimedia content.	,34375	1,65801	,250
	I can create messages adapted in form and content to the characteristics of the digital communication channels I will broadcast.	-,90909	1,52815	,002
	I can create digital audio by mixing voice and music.	-,81818	1,23629	,001
	I can design and create digital presentations combining images, graphics, and texts.	-,59375	1,52102	,035
Digital Content Creation	I can create my videos by inserting photos, graphics, film clips, and texts.	-,84375	1,46154	,003
	I can use digital editing programs (audio and/or video) to modify content created by other authors or by me.	-,80645	1,40046	,003
	I know the regulations that regulate copyright according to the type of license chosen to protect them.	-,75000	1,27000	,002
	I am aware of the procedures by which an author liberalizes his rights and makes his work in the public domain free of charge.	,34375	1,65801	,250
	I can modify the basic configuration of the tools and digital media to adapt to my needs and limitations.	-,90909	1,52815	,002
	I can perform essential maintenance and protection operations on my devices for system updates, antivirus, access passwords, etc.	,00000	1,73205	1,000
	I know how to act when I detect a security threat on my devices and equipment.	-,09677	1,61977	,742
Safety	I can protect sensitive personal data.	-,03226	1,16859	,879
	I can protect my digital identity and that of others.	-,29032	1,16027	,174
	I can make optimal use of digital devices so that they have the most negligible environmental impact.	,06452	1,48179	,810
	I can adopt effective measures to save energy and extend the life of the batteries of my digital devices.	,06452	1,63168	,827
	I can identify a technical problem by clearly explaining what the malfunction consists of.	-,93333	1,04826	,000
Problem Solving	I can solve non-complex technical problems related to standard digital devices and environments with the help of manual or available technical information.	-,63333	1,40156	,019
	I can use virtual environments to follow online courses for my training.	-,53333	1,04166	,009

I can consult specialized forums that help me solve doubts or problems.	-,56667	1,27802	,022
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Table 2 shows the data referring to the other three content areas, digital content creation, safety, and problem-solving. In the digital content creation area, the participants showed a significant improvement. Specifically, on the developing digital content sub-dimension, 4 out of 6 questions displayed significant improvement, as the average results on the majority of these questions increased to clearly above average or, in some cases, such as managing web spaces and publishing self-created content, to having a perfect understanding of the subject (M=3,97). On the other hand, the safety content improved in some areas, such as protecting an individual's digital identity from others, but they needed to be considered statistically meaningful. Generally, the students and teachers showed an average understanding of the safety content area, which did not improve significantly after International Week.

Nonetheless, the last content area, problem-solving, significantly improved all questions. The participant exhibited average knowledge of how to solve technical problems, identify needs, and utilize digital content to enhance their competence before the event. However, they reported higher results after the event, significantly improving their knowledge by utilizing digital tools, such as online courses and forums. These results are significant as the e-toolkit utilizes such digital content and tools.

5. Discussion

The importance of digital competence is highlighted in various policy agendas as a critical skill for the future in a knowledge-based economy, facilitating the digital restructuring of society. The COVID-19 pandemic has further underscored the significance of digital competencies in comprehending the use of digital technologies in educational contexts (König et al., 2020) and the work environment (Murawski, M., & Bick, 2017).

One of the primary goals of this research study was to evaluate the potential of an innovative e-toolkit on the students' and teachers' digital competencies. Based on our results, the level of competence relating to information and data literacy, as well as communication and collaboration, showed slight improvement. However, as it was revealed, their average levels were already high, especially in some aspects of information and data literacy, where questions had a mean score of over 4 in 5 before the event. This also correlates to other post-Covid studies (Poszytek et al., 2022). Although the lack of digital competencies among teachers and students has been shown in the past (Artacho et al., 2020), during the pandemic, many universities and educational institutions utilized remote teaching (Gamage et al., 2020). This increased teacher and student competencies and teachers' acceptance of ICT use in teaching (Huamán-Romani et al., 2022). Because the primary focus of most ICT use during the pandemic was online teaching (Pokhre & Chhetri, 2021), it stands to reason that students and teachers display high levels of competence in these two dimensions.

The areas of digital competence that showed significant improvement were the digital content creation and problem-solving sections. Unlike similar studies before Covid-19 that presented low levels of digital content creation (Amhag et al., 2019; Artacho et al., 2020), the digital content creation of the teachers and students was near average before the event. However, their competencies improved in that dimension as well as their problem-solving skills after their workshops with the use of the e-toolkit. Academic environment support and enhancement of teachers' readiness are vital for increasing teachers' digital literacy (Li & Yu, 2022). Therefore, a tool that can increase these aspects can lead to an increase in digital competencies, especially in aspects that students also display lower results (Martzoukou, Fulton, Kostagiolas, & Lavranos, 2020). As for the section regarding safety, both teachers and students have shown to be less aware and lack knowledge in this aspect (Porlán & Sánchez, 2016; Gallego-Arrufat et

al., 2019), the need for in-depth development after the pandemic era is still evident as though the levels were adequate, there is still room for improvement.

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