DIGITRANER 4.0
Upskilling Trainers to Education 4.0

WP2.2: National Reports, European Synthesis report & translation
A2: Research, design & content

Synthesis Report

CRES, Italy

June 2024

Co-funded by the European Union

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1. Introduction

In the second work package of the project DIGITRAINER 4.0 - Upskilling Trainers to Education 4.0, all the project partners carried out questionnaires and interviews using a qualitative and quantitative research approach to obtain information about the current state of use of digital tools and the needs of educators in the field of teaching and education in Italy 4.0.

In total, **191 teachers, trainers and educators** from different educational levels and specialisations and **10 experienced mentors** in innovative teaching methods were involved in the partnership countries - NL, IT, ES, MT, GE.

The aim of the interviews was to identify the training needs and challenges schools face in using digital technologies and tools in the current educational context.

The questionnaires and interviews were conducted online - between April and June 2024 - with teachers from different teaching areas and educational backgrounds to ensure diverse participation.

The results of the questionnaires and interviews conducted in all partner countries are summarised below.

2. Analysis of the results of the surveys conducted

2.2 Surveys to teachers

1. Interviewees' Profile

The first part of the teacher survey was structured to profile the participants and to understand their background, age group, gender, role in the school or training institution, years of professional experience and the subject in which the teacher teaches or specialises.

The summary of the results obtained from the participants is as follows:

Country	The Netherland Italy Spain Malta Germany	35 50 36 35 35
Age Range (years)	+60 50-59 40-49 30-39 25-29 -25	19 45 57 44 18 7

Gender	F M	114 77
Professional Experience years	+ 15 10 – 15 7 – 10 4 – 6 1 – 3 - 1	76 16 42 26 22 8
Professional Background	Linguistic field Historical-Philosophical field Scientific field Pedagogical-social field Artistic-expressive field Economic-administrative field Technological field Other	55 28 19 18 16 20 18 17

2. Experiences in the Use of Digital Tools

The second part of the questionnaire focused on the use of digital tools, specifying the type of tools used, how often they were used, and how they learned to use them.

The summary of the results obtained from the participants is as follows:

Frequency of Use	Never Rarely / 1-2 times per month Sometimes / 1 times per week Often / 2-3 times per week Very often / daily use	19 45 57 44 18
Types of Tools *(multiple-choice)*	Learning Analytics Content Delivery Assessment and Feedback Collaboration and Communication	36 136 82 76
Reasons for Use	- Diversify teaching - Better distribution of information - Increase student attention span/engagement - Provide access to wider and more varied resources - Encourage interaction with students - Facilitate work / productivity - Improve lesson planning / manage classes effectively - Save time / speed up preparation - Possibility of creating new resources / preparing activities - Get closer to the digital language of the students - Help to personalise the educational offer - Enable online teaching	

	- Make learning more effective - Promote strategies to ensure all students / equity and inclusion	
Training Methods ***(multiple-choice)***	Study career (university) Post-grade training course Self-learning Peer-learning Other (post-degree)	56 30 137 62 2

3. Level of Digital Skills

The third and final section of the questionnaire focuses on the level of digital literacy (current and desired) and teachers' perceptions of various digital literacy issues in schools.

Digital devices ***(equipped – used)***	Interactive Multimedia Whiteboards Tablets Electronic Register Computers – notebooks Graphic boards – pen tablets – pen-displays	105 71 102 121 66	76 59 99 112 48
Skill Rating ***(self-assessment)***	Excellent Very Good Good Fair Poor	20 83 58 27 3	
Willingness to improve knowledge on digital education tools	To the full extent To a very high extent To some extent No	73 72 43 3	
Perception of Digitization Needs ***(rate from 1-low to 5-high)***	- Tools and digital resources to enhance teaching and learning - Training and education on effective technology integration in the classroom - Access to suitable technological devices for students - Technical support and maintenance of digital infrastructure in the school - Strategies to ensure equity and digital inclusion among students - Development of clear policies and guidelines for technology use in education - Integration of technology to facilitate assessment and feedback of learning	4.46 4.42 4.19 4.37 4.21 4.30 4.26	

From the responses received, it is clear that there is a desire to improve the use and integration of digital resources in the educational context, with a need to support the process in terms of training, accessibility and inclusion. These findings point to the need for continuous professional development, targeted training programmes and a focus on digital literacy to improve the overall educational experience.

3. Findings from the interviews conducted to the two experienced mentors in education 4.0

The **10 mentors** interviewed, from the different five countries, for the DIGITRAINER 4.0 project have large experience in the educational sector, especially in the integration of digital technologies in learning processes.

The responses show that all the mentors make extensive use of digital tools and technologies, in particular technological devices such as computers, tablets, digital books, multimedia, and innovative digital tools for:

- **Creating educational resources**, thanks to tools such as BookCreator, Canva, LearningApps, StopMotion Studio,… and generative AI platforms and systems, which are the latest evolution of the self-guided learning experience;
- **Setting up and managing classrooms** (Microsoft Teams, Google Meet, Zoom...), these tools are particularly useful for maintaining student interaction and engagement, even when they are learning remotely. They can also be used to host one-to-one tutorials and group meetings, facilitating communication and collaboration outside the physical classroom;
- **Engaging students in the learning process**, such as Kahoot!, Quizlet for dynamic and gamified engagement, or Google Docs, Microsoft OneNote to enable students to collaborate on projects in real time, share ideas and edit shared documents simultaneously. This encourages collaboration between students and improves their ability to work as a team, even over distance;
- **Collect assessments and feedback**, using tools such as Turnitin to detect plagiarism and Rubric for assessing student work to establish clear assessment criteria;
- **Facilitating communication** with parents and collaboration between teachers and therapists through online educational platforms, such as Seesaw or ClassDojo. These digital tools not only help personalise learning to meet students' individual needs, but also encourage their independence and participation in the classroom.

Among the elements that respondents refer to the importance of the use of digital tools in the educational space, are: increased productivity, capture the attention of students

and promote the efficiency of the training process, facilitate the learning of students and the preparation of activities by the trainer, the speed to prepare, evaluate and measure content and the need for both trainers and students to adapt to these tools that are becoming increasingly important in different spheres of life.

Respondents identified several key needs for effective digitisation in their school environments, which are summarised below:

- Technological support and robust infrastructure, including modern technology within educational institutions, available to both teachers and students;
- Ongoing training and support for both teachers and students, essential for the effective and conscious use of digital tools;
- Increased accessibility to information and resources, with the consequent possibility of adapting them to the needs of the class, allowing for more inclusive teaching, especially in the case of students with learning difficulties, for whom adapted materials can be provided.
- Collaboration in the sharing and exchange of knowledge between teachers and students, promoting more dynamic and participative learning;
- Developing clear policies and guidelines for the use of technology in education, promoting participation and engagement in the digital school environment;

4. Conclusions and recommendations

The results of the survey and interviews carried out in the DIGITRAINER 4.0 project provide a fairly comprehensive picture of the current state of use of digital tools and the needs of the educational sector. Both the results of the survey and the information gathered by the mentors show that there is now a great commitment on the part of teachers to the use of new technologies and tools in didactics (preparation, communication and sharing of resources), as well as a willingness to train or update themselves.

It is clear that the use of content delivery platforms, learning analytics and artificial intelligence tools is growing strongly in the education sector, but many educators still lack adequate training and/or support within institutions (especially public ones). In particular, teachers have expressed an interest and need in the implementation of integration strategies - methodologies, continuous professional development, technological support and access to digital resources skills and knowledge. Despite the disparity in the availability and use of digital resources between different schools across the country, the need for a more unified and continuous approach to innovative digital education is highlighted by both the questionnaires and the mentor interviews.

The recommendations gathered by the partnership are summarised below:

Enhance Training and Professional Development Programs

- Invest in continuous professional development programs focusing on effective technology integration.
- Facilitate frequent training sessions and workshops on new digital tools and technologies, especially those that are relevant to the diverse range of subjects taught.
- Provide specialized training on the use of AI in education to help teachers leverage these technologies for lesson planning, student assessment, and personalized learning.

Improve Technical and Monitoring Infrastructure

- Invest in the improvement of the technological infrastructure, including modern technology within educational institutions available to both teachers and students.
- Provide ongoing technical support and maintenance to ensure that digital tools and infrastructure are always in optimal condition, minimising downtime and ensuring seamless integration of digital tools in the classroom.
- Continuously evaluate and update the digital tools and technologies used in schools to keep pace with technological advancements and industry trends.
- Conduct regular assessments to monitor the effectiveness of digital tool integration and professional development programs, and use this data to make informed decisions and adjust strategies as needed.

Promote Equity, Digital Inclusion and Collaborative Learning Environment

- Invest in the equitable provision of modern technology across the territory and implement inclusive strategies to ensure fair and equal access for all pupils and equal opportunities to benefit from digital learning.
- Develop and disseminate clear policies and guidelines that promote digital equity and ensure compliance with data protection regulations such as GDPR, ethical considerations and best practice.
- Foster a supportive environment where teachers can experiment with and adopt new technologies without fear of failure, encouraging innovation and continuous improvement.
- Use online platforms and forums to share knowledge and support teachers.
- Tailor the use of digital tools to the specific needs of different groups of students, ensuring that tools are selected on the basis of identified needs such as engagement, collaboration or access to information.

Focus on Digital Literacy and Skills

- Implement student-centred programmes that focus on improving students' digital literacy, critical thinking and ability to use digital tools effectively, such as using the Internet safely, identifying credible information and understanding the ethical implications of technology use.
- Integrate digital skills into the curriculum to ensure that students develop basic digital skills and are prepared for the demands of the modern workforce and society;
- Provide targeted training programmes that focus on teaching educators how to effectively use digital tools to inspire and engage students.

Promote Innovative Digital Approaches and Tools

- Encourage the use of content delivery platforms, learning analytics tools, collaboration and communication applications, and assessment and feedback tools to enhance the learning experience.
- Promote the use of innovative technologies such as AI and VR to create immersive and engaging learning experiences.
- Establish feedback mechanisms for educators and students to share their experiences and challenges with digital tools, ensuring that their needs are addressed in a timely manner.
- Foster policies that encourage the integration of technology to facilitate learning assessment and feedback.

These recommendations aim to promote a new, more cohesive and inclusive view of innovative digital education for educators and students to move confidently in an increasingly digital world.

Subsequent phases of the project, involving the design and development of targeted training programmes, will build on the recommendations gathered through the survey to address the needs and gaps identified and promote a more innovative and inclusive educational environment.

Annexes:

- *5 National Reports*
- *15 Best Practices*

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National Reports

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Schwerpunkt Zentrum, Germany

1. Introduction

Questionnaire

To acquire information on the digital competencies and needs of trainers in Germany, the DIGITRAINER 4.0 project performed a thorough survey and interviews. 35 trainers and teachers were given the survey, which was distributed using Google Forms as the data gathering tool.

A range of question formats, including multiple-choice and open-ended questions, were used in the survey to collect comprehensive demographic data, such as age, gender, role, years of professional experience, and area of specialization. Furthermore, the survey concentrated on how frequently, which particular tools, and why participants used them in their instructional methods when using digital tools. In addition, participants were asked to rate their own proficiency and comfort levels with digital technologies.

The survey asked questions about the primary needs related to digitalization that participants had identified, the availability and usage of digital devices in their institutions, and their willingness to learn more about digital education tools in order to gain a better understanding of the broader context of digitalization in schools. The initiative was able to pinpoint specific training requirements and resource gaps because to its all-encompassing strategy.

Interview

In addition to the survey, the project used Google Forms to conduct in-depth interviews with two trainers. The purpose of the interview questions was to learn more about the trainers' comfort levels, experiences with digital tools, needs particular to digitalization, and the results of utilizing digital resources in their teaching settings. The interviews also looked at the trainers' opinions on the support they received from their institutions, how they disseminated their expertise among peers, and any suggestions they had for improvement.

In order to find recurring themes and insights, the survey and interview results were methodically documented and then examined. Through the use of a mixed-method approach, a thorough understanding of trainers' digital competencies as they currently stand and the particular demands that the DIGITRAINER 4.0 project seeks to meet were made possible. The comprehensive understanding obtained from this data gathering stage will guide the creation of customized training materials and programs, guaranteeing that they satisfy the real requirements of instructors and successfully support the objectives of the DIGITRAINER 4.0 project.

For your reference, the following links will take you to the survey and interview forms: Survey for Trainers and Online Interviews.

2. Analysis of the results of the surveys conducted

2.2 Surveys to teachers

There were 31 German participants in the survey for the DIGITRAINER 4.0 project, with a balanced gender distribution of 53.6% men and 46.4% women. The respondents' ages ranged from 32.1% to 25.0% for those aged 30-39, 21.4% for those aged 25-29, and 10.7% for those under 25 and 50-59. 50.0% of respondents identified as teachers, 25.0% as trainers, 10.7% as administrators and academic managers, 7.1% as pre-service teachers, and 3.6% as learning support educators and instructional designers. Less than a year to more than 15 years was the range of their years of experience, with 25.0% having more than 15 years. With 28.6% of the courses taught in the linguistics field, 25.0% in the historical-philosophical field, 17.9% in the pedagogical-social field, and lower percentages in the disciplines of economics, administration, science, technology, and the arts and expressive arts, the subjects taught were diversified. The wide range of professional backgrounds and demographics offered a thorough grasp of the digital competencies and requirements of the trainers.

The survey respondents' experiences using digital tools differed widely. The majority of respondents indicated that they used digital tools frequently, with daily use being the most prevalent frequency. The tools used included Quizizz and Google Forms for assessments, as well as content delivery systems like Moodle and Google Classroom. Mentimeter and Teams were two examples of collaboration technologies that were commonly cited. Increasing student participation, customizing instruction, and expediting administrative duties were the main driving forces for the adoption of digital tools. The main ways that the participants acquired these skills were through peer learning, university courses, and independent study.

According to the survey, most respondents gave their digital abilities excellent marks overall. In particular, 16.1% (5 individuals) assessed their digital talents as great, while 51.6% (16 individuals) thought they were very good. Furthermore, 9.7% (3 individuals) said their skills were fair, and 22.6% (7 participants) said they were good. The respondents' distribution suggests a high level of expertise in digital abilities, which is consistent with their frequent and varied usage of digital resources in learning environments.

In reference to digitization in the educational setting, the survey respondents listed a number of critical demands. A significant majority emphasized the importance of access to digital tools and resources for enhancing teaching and learning, with 80.6% rating this need as high (scores of 4 or 5). With 77.4% of participants reporting a strong need, training and education on successfully integrating technology into the classroom were also considered essential. Seventy-one percent of respondents emphasized the importance of technical support and upkeep of digital infrastructure, while sixty-seven percent underlined students' access to appropriate technological gadgets. For 64.5% of respondents, it was imperative to guarantee equity and digital inclusion for students. Furthermore, 67.7% emphasized the necessity of integrating technology to support assessment and feedback, and 61.3% emphasized the creation of explicit policies and norms for technology use in education. These findings show that participants have a thorough understanding of the many needs for successful digitization in schools.

3. Findings from the interviews conducted to the two experienced mentors in education 4.0

Both of the experienced mentors that were interviewed for the DIGITRAINER 4.0 project have over 15 years of combined experience working in Germany. A male teacher specializing in language education is one of the mentors, and a male mentor with a background in pedagogy and social work is the other.

The mentor has a strong history in language education and uses a variety of digital tools and online exercise platforms to improve his instruction. He stresses the use of digital aids in fulfilling the varied needs of his students and feels at ease utilizing them. According to him, access to sufficient digital resources and ongoing professional development for educators are the two main requirements for digitalization in schools. He feels that his institution offers the required training for using technology, and he actively shares his knowledge of digital tools with colleagues.

The mentor, with a specialization in the pedagogical-social field, integrates digital tools extensively in his teaching practices. Additionally, he emphasizes how easy it is to use digital technologies to engage students and accomplish learning objectives. According to him, the availability of digital resources, teacher professional development, and guaranteeing that every student has fair access to technology are the three most important needs in the classroom. While his current school offers some training, he believes there is room for growth, particularly in providing thorough and continuing professional development. He is proactive in sharing his skills with his peers. Because of their wealth of knowledge and proactive use of digital tools, mentors play a crucial role in advancing digital literacy and aiding in the digitization of their educational environments.

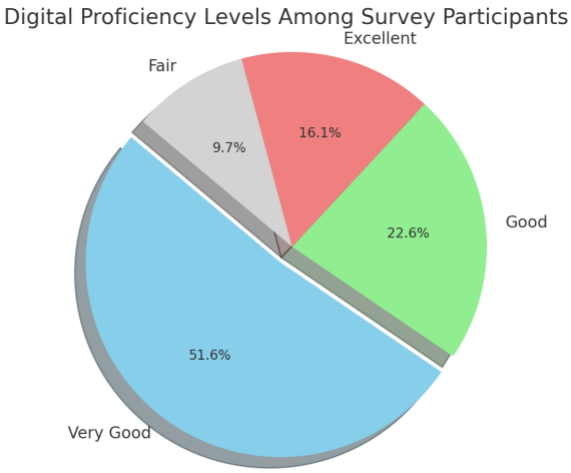
The two experienced mentors' wide usage of cutting-edge digital tools and their understanding of the requirements of the educational setting were made clear during their interviews. With more than 15 years of combined professional experience, both mentors make use of a variety of digital tools to improve their teaching methods. To engage students and customize learning, language field specialist teachers often make use of digital technologies such as online exercise platforms. In a similar vein, the pedagogical-social trainer incorporates a range of digital technologies to help with learning and promote communication with students. The ease with which both mentors use these resources demonstrates their self-assurance and adeptness in digital literacy.

Mentors found a number of urgent requirements for the school environment's digitization. They underlined that in order for educators to successfully incorporate technology into the classroom, they must get ongoing professional development and training. Students' access to sufficient digital resources and technology gadgets was emphasized as being crucial. They also emphasized how crucial technical maintenance and assistance are to the efficient operation of digital technologies. The mentors also emphasized the necessity of plans to guarantee student equity and digital inclusion. The mentors engage in active knowledge sharing with their peers, demonstrating a cooperative strategy for improving digital capabilities in their educational institutions. They pointed out that even with some support already in place, there is still need for development in terms of offering thorough instruction and materials to completely support the digitalization initiatives in education.

4. Conclusions

A thorough overview of the existing state of digital tool usage and the demands within the educational sector is provided by the data gathered from the survey and interviews conducted as part of the DIGITRAINER 4.0 project. The survey's findings, along with the information gleaned from speaking with seasoned mentors, demonstrate both the areas that benefit greatly from the use of digital tools in education and those that still need work.

The majority of respondents to the study rated their digital proficiency as very good or exceptional, indicating a high degree of expertise. Digital tools are becoming increasingly common in education, as evidenced by the use of LMSs, assessment systems, and collaborative applications. Critical needs in the educational setting, however, were identified by the survey and interview data as well. These included strategies for guaranteeing diversity and inclusion, ongoing professional development, technological support, and access to digital resources. These findings were supported by the mentors' experiences, which highlighted the necessity of continual training and assistance in order to successfully incorporate digital tools into their teaching practices.



Recommendations at the National Level

Germany should provide extensive professional development programs centered on digital literacy for educators, making sure that training is easily accessible and updated on a regular basis, in order to facilitate the incorporation of digital technology into education. Schools require greater access to modern technology and digital resources, which can only be provided by government partnerships and funding. Enacting policies for fair access to digital technologies for all students is essential, as is creating a national framework for strong technical support and upkeep. Clearly defined policies and procedures for integrating technology should be developed, offering a foundation for the efficient application of digital technologies in a variety of subjects and academic settings.

SOML, The Netherlands

1. Introduction

To gather comprehensive data for the DIGITRAINER 4.0 project at Connect College in Echt, the Netherlands (part of the SOML consortium), a mixed-methods approach was employed. This approach involved both quantitative and qualitative data collection techniques, ensuring a well-rounded understanding of the current state of digital tool usage and needs among educators.

Timing

- **Questionnaires**: Administered in April and May 2024.
- **Interviews**: Conducted in May 2024, following the initial analysis of the questionnaire data to inform the interview questions.

Participants

The survey targeted teachers and trainers from various educational levels and specializations at Connect College. This diverse sampling provided a broad perspective on digital education practices within the institution.

Selection

A mix of experienced educators and newer teachers were included to gather a range of insights.

Data Collection

1. **Questionnaires**: Respondents provided information on their demographics, professional background, experiences with digital tools, skill levels, and perceived needs regarding digitization in the school environment.
2. **Interviews**: Follow-up interviews were conducted with selected respondents who demonstrated significant experience or insights into digital tool usage. These interviews aimed to delve deeper into the qualitative aspects of digital tool integration and the challenges faced.

Data Analysis

1. **Quantitative Data**: Responses from the questionnaires were analyzed using statistical methods to identify trends, commonalities, and significant differences in digital tool usage and needs.

2. **Qualitative Data**: Interview transcripts were analyzed using thematic analysis to extract key themes and insights. This qualitative data complemented the quantitative findings, providing a richer understanding of the context and nuances.

Links to the Questionnaires

The online questionnaire was accessible through a Google Forms link, which was shared with potential respondents via Connect College's internal communication channels. The link ensured ease of access and encouraged wide participation.

This methodology ensured a comprehensive and reliable collection of data, providing a solid foundation for analyzing the current state and future needs of digital education tools among teachers and trainers at Connect College in Echt.

2. Analysis of the results of the surveys conducted

2.2 Surveys to teachers

1. Interviewees' Profile

- **Age Range**: The majority of respondents fall within the 40-49 and 50-59 age ranges, with some younger participants aged 25-29.
- **Gender**: The sample is predominantly female (72%), with a smaller male representation (28%).
- **Professional Background**: All respondents are teachers with varying years of professional experience, primarily more than 15 years. They specialize in diverse fields such as Linguistics, Artistic-expressive fields, and Geography.

2. Experiences in the Use of Digital Tools

- **Frequency of Use**: Most teachers reported using digital tools very often or on a daily basis. A few use these tools 2-3 times per week.
- **Types of Tools**: Teachers use a variety of digital tools, including:
    - **Content Delivery**: Platforms like Teams, Moodle, and Google Classroom.
    - **Learning Analytics**: Tools for tracking and analyzing student data.
    - **Assessment and Feedback**: Tools such as Google Forms and Edpuzzle.
    - **Collaboration and Communication**: Applications like Mentimeter, Teams, and Google Suite.

- **Reasons for Use**: Digital tools are used to enhance lesson enrichment, clarity, student independence, reduce paperwork, and provide fast overviews of student performance.

3. Level of Digital Skills

- **Skill Rating**: The majority rate their digital skills as 'Good' to 'Very Good', with a small number indicating 'Excellent'.

- **Training Methods**: Teachers have learned to use these tools through a mix of self-learning, peer-learning, post-graduate training courses, and formal study.

4. Perception of Digitization Needs

- **Key Needs Identified**:
    - **Tools and Resources**: High demand for more digital resources to enhance teaching and learning.
    - **Training and Education**: Strong need for continuous professional development on effective technology integration.
    - **Access to Devices**: Adequate access to suitable technological devices for students is essential.
    - **Technical Support**: Ongoing technical support and maintenance of digital infrastructure in schools.
    - **Equity and Inclusion**: Strategies to ensure all students, regardless of background, have access to digital learning opportunities.
    - **Policies and Guidelines**: Clear policies and guidelines for technology use in education.
    - **Assessment Integration**: Improved integration of technology to facilitate assessment and feedback.

  The responses highlight a well-experienced teaching cohort actively engaging with digital tools but also emphasize the need for enhanced support and resources to fully realize the potential of digitization in education.

3. Findings from the interviews conducted to the two experienced mentors in education 4.0

1. Interviewees' Profile and Professional Background

- The two mentors interviewed for this section have extensive backgrounds in the educational sector, particularly in the integration of digital technologies into teaching and learning processes.
- **Mentor 1:** An educational technology specialist with over 20 years of experience in secondary education. They have played a pivotal role in implementing digital tools and fostering digital literacy among teachers and students.
- **Mentor 2:** A pedagogical expert with 15 years of experience in primary education. This mentor has focused on developing innovative teaching methodologies and integrating emerging technologies such as AI to enhance student engagement and learning outcomes.

2. Summary of Innovative Digital Tools Used, Identified Needs, and Target Groups

Main Innovative Digital Tools Used

- The mentors highlighted several digital tools and technologies currently employed in their educational settings:
- **Content Delivery Platforms**: Tools like Google Classroom and Moodle are extensively used for organizing course materials, assignments, and providing feedback.
- **AI Tools**: ChatGPT and other AI-driven applications are being explored for automating administrative tasks, developing interactive lesson plans, and providing personalized learning experiences.
- **Learning Analytics**: Platforms that track and analyze student performance to tailor educational content and identify areas needing improvement.
- **Collaborative Tools**: Software such as Microsoft Teams and Zoom facilitate communication and collaboration among students and between students and teachers.

Needs Identified in the School Environment

- The mentors identified several key areas that need addressing to optimize the use of digital tools in education:
- **Professional Development**: Continuous training for teachers on the latest digital tools and methodologies to ensure effective integration into the curriculum.
- **Infrastructure Improvement**: Enhancing internet connectivity and access to modern devices across all schools, particularly in under-resourced areas.
- **Policy and Support**: Establishing clear policies and providing technical support to ensure smooth operation and maintenance of digital systems.

Target Groups

- The primary beneficiaries of these digital tools and improvements include:

- **Students**: Who gain from personalized learning experiences, enhanced engagement, and improved learning outcomes.
- **Teachers**: Who benefit from reduced administrative burden, better tools for lesson planning and delivery, and ongoing professional growth.
- **School Administrators**: Who can leverage data-driven insights to make informed decisions and improve overall school performance.
- The insights from these interviews underscore the transformative potential of digital tools in education while highlighting the essential support structures needed to fully realize their benefits

4. Conclusions

The survey and interview results indicate a significant engagement with digital tools among teachers and trainers, albeit with varying levels of proficiency and integration. The use of content delivery platforms, learning analytics, and AI tools is growing, yet many educators still lack comprehensive training and support. There is a clear disparity in digital resource availability and usage between different schools and regions, highlighting the need for a more unified approach to digital education.

Recommendations at National Level

1. **Enhanced Professional Development Programs**
    - **Continuous Training**: Implement ongoing professional development programs focusing on the latest digital tools and pedagogical strategies to ensure educators are well-equipped to integrate technology effectively.
    - **AI Integration**: Provide specialized training on the use of AI in education to help teachers leverage these technologies for lesson planning, student assessment, and personalized learning.
2. **Infrastructure Improvement**
    - **Equitable Access**: Invest in improving internet connectivity and providing modern digital devices across all schools, especially in rural and under-resourced areas, to ensure all students have equal opportunities to benefit from digital learning.
    - **Technical Support**: Establish robust technical support systems to maintain and troubleshoot digital infrastructure, minimizing downtime and ensuring seamless integration of digital tools in the classroom.
3. **Policy Development and Implementation**

- **Clear Guidelines**: Develop and disseminate clear policies regarding the use of digital tools and AI in education, including data privacy, ethical considerations, and best practices.

- **Supportive Environment**: Foster a supportive environment where teachers can experiment with and adopt new technologies without fear of failure, encouraging innovation and continuous improvement.

4. **Focus on Digital Literacy and Skills**

   - **Student-Centered Programs**: Implement programs that focus on improving students' digital literacy, critical thinking, and ability to navigate digital tools effectively. This includes safe internet usage, discerning credible information, and understanding the ethical implications of technology use.

   - **Curriculum Integration**: Integrate digital literacy into the national curriculum, ensuring that students are prepared for the demands of the modern workforce and society.

5. **Monitoring and Evaluation**

   - **Regular Assessment**: Conduct regular assessments to monitor the effectiveness of digital tool integration and professional development programs. Use this data to make informed decisions and adjust strategies as needed.

   - **Feedback Mechanisms**: Establish feedback mechanisms for educators and students to share their experiences and challenges with digital tools, ensuring their needs are addressed promptly.

These recommendations aim to create a cohesive, well-supported framework for digital education across the nation, ensuring that all educators and students can thrive in an increasingly digital world. The next steps involve conceptualizing and developing targeted training programs that address the identified needs and gaps, ultimately fostering a more innovative and inclusive educational environment.

CRES, Italy

1. Introduction

In order to collect comprehensive data for the DIGITRAINER 4.0 project of CRES, Centre for Research and European Studies, an approach based on qualitative and quantitative research techniques, in particular surveys and interviews, was used to obtain information on the current state of use of digital tools and the needs of educators in the field of teaching and Italian 4.0 education.
A total of 50 teachers and 2 expert tutors participated in the surveys and interviews.

The questionnaire was sent to teachers from different educational areas and with different educational backgrounds in order to guarantee a diversified participation. It was completed between April and May 2024. The teachers' questionnaire was disseminated online through various communication channels at the following link: https://docs.google.com/forms/d/e/1FAIpQLSemRkE8nDImCMxihsXCKkWKRTsHCOWTfa4i_40wEU15NPGFqQ/viewform?usp=sf_link.

Interviews with mentors experienced in Education 4.0 were conducted between May and June 2024 and collected using the following form: https://docs.google.com/forms/d/e/1FAIpQLSe7Gnj9NFdQIQ9cKAFBbHQs5h3Cg9hqBqWLk4qWUjyRV_OHHA/viewform?usp=sf_link.

2. Analysis of the results of the surveys conducted

2.2 Surveys to teachers

1. Interviewees' Profile

The first part of the teacher survey was structured to profile the participants and to understand their background, age group, gender, role in the school or training institution, years of professional experience and the subject in which the teacher teaches or specialises. The summary of the results obtained from the 50 participants is as follows:

- **Country**: As the questionnaire was distributed nationally in Italian, all participants were Italian.
- **Age Range**: Participants are fairly evenly spread across the different age groups, with 22% in the 30-39 age group, 24% in the 40-49 age group, 32% in the 50-59 age group, 16% in the 60+ age group and 6% in the younger 25-29 age group.
- **Gender**: The group of participants is predominantly female (74%), with a smaller representation of males (26%).

- **Ruolo**: Almost all participants belong to the teacher-educator category (92%).
- **Professional Background**: All respondents are teachers with varying years of experience, mainly 44% with more than 15 years and a good number of respondents (26%) with between 7 and 15 years of teaching experience. They specialise in different fields, with the majority of teachers specialising in languages (36%), business/administration (14%) and history/philosophy.

2. Experiences in the Use of Digital Tools

The second part of the questionnaire focused on the use of digital tools, specifying the type of tools used, how often they were used, and how they learned to use them. The answers given by the participants suggest that:

- **Frequency of Use**: 78% of teachers reported that they use digital tools very often or every day, the remaining 18% use them often 2-3 times a week, while 4% use them only sometimes or once a week. None responded that they rarely or never use them.
- **Types of Tools**: Teachers use a variety of digital tools, but the majority use content delivery tools (such as Teams, Moodle, Google Classroom, OER...) with 76%, followed by collaboration and communication tools (such as Mentimeter, Teams, Google Suite, Canva...) with 68%, and assessment and feedback tools (such as Google Forms, Jotform, Edpuzzle...) with 50%.
- **Reasons for Use**: Regarding the use of digital tools, the participants replied that they use them mainly because they diversify teaching, allow better sharing of information, increase students' attention span, give access to broader and more varied resources than the textbook alone, stimulate interaction with students, facilitate work, they improve the planning and organisation of teaching activities, they save time, they offer the possibility to create new resources, they are closer to the digital language of the students, they allow an inclusive and well adapted didactic guidance to the needs of the students (even in cases of learning difficulties) and they help to personalise the educational offer.
- **Training Methods**: Significantly, 80% of participants claim to have learned how to use digital tools through self-learning and/or partly through peer exchange. Only a fraction claimed to have received postgraduate training or to have learned to use the tools during their university career.

3. Level of Digital Skills

The third and final section of the questionnaire focuses on the level of digital literacy (current and desired) and teachers' perceptions of various digital literacy issues in schools.

- **Skill Rating**: The majority of teachers reported that they had reached a 'good' (22%) or 'very good' (52%) level, but almost all participants reported that they wanted to improve their skills to a maximum or high degree.
- **Perception of Digitization Needs:** Through a series of specific questions on the main needs that the teacher identifies regarding the digitisation of the school environment, it turned out that:
    1. Tools and resources: High demand (63.3%) for more digital resources to improve teaching and learning.
    1. Training and development: Strong need (65.3%) for professional development on effective integration of technology.
    2. Access to equipment: 75.5% of participants believe there is a strong need for increased access to appropriate technology devices for students.
    3. Technical support: 65.3% support the importance of ongoing technical support and maintenance of digital infrastructure in schools.
    4. Equity and inclusion: There is a strong need (71.4%) for strategies to ensure that all students, regardless of background, have access to digital learning opportunities.
    5. Policies and guidelines: Clear policies and guidelines for the use of technology in education.
    6. Assessment integration: Better integration of technology to facilitate assessment and feedback.

From the responses received, it is clear that there is a desire to improve the use and integration of digital resources in the educational context, with a need to support the process in terms of training, accessibility and inclusion.

3. Findings from the interviews conducted to the two experienced mentors in education 4.0

Both mentors interviewed for the DIGITRAINER 4.0 project have experience in the educational sector, especially in the integration of digital technologies in learning processes.
Mentor 1 is a female teacher specialising in economics with experience in secondary education and a background in teaching methodology, while Mentor 2 is a male teacher specialising in languages in secondary education with a background in pedagogy, communication and conflict mediation.
The responses indicate that both mentors make extensive use of digital tools and technologies, particularly technological resources such as computers, tablets, digital books,

multimedia, with a preference for digital tools for creating educational resources such as BookCreator, Canva, LearningApps, StopMotion Studio and generative PCTO and AI platforms.

In particular, technological resources such as computers, tablets, digital books, multimedia and the web are constantly evolving tools with enormous potential to complement teaching.

With regard to the needs identified in the field of digitalisation in the school environment, the mentors agree on the need, on the one hand, to provide more training for teachers through courses aimed at learning and updating digital tools and innovative teaching methods (which are often lacking due to the lack of intellectual and financial resources in public institutions) and, on the other hand, to support and accompany students in a continuous and not sporadic path of using digital learning systems: "The new generations must be confronted with digitalisation, because school has changed and we need to continuously improve this aspect".

The results obtained from the use of digital tools in the educational environment, according to the mentors, show greater efficiency both in the preparation of teaching resources and in sharing and communicating them with students, facilitating their involvement and encouraging the development of computational thinking. The accessibility of resources and the possibility of adapting them to the needs of the class allows for more inclusive teaching, especially in cases where there are students with learning difficulties for whom ad hoc materials can be provided.

Although mentors state that they compare and share their personal digital skills with their colleagues, they also point out that, in their own experience, the training provided by the institutions in which they have worked is not homogeneous. In many schools, a lot of attention is paid both to the acquisition of technological equipment for teachers and to the updating of teachers, who are provided with specific and targeted training courses on innovative teaching methods and digital tools. Unfortunately, many public educational establishments are still very backward in the use of technology and digital resources, which penalises teachers who are unable to use and keep up with technological and digital progress, and students who leave school without adequate knowledge of the tools that are still widely in demand in the world of work.

4. Conclusions

The results of the survey and interviews carried out in the DIGITRAINER 4.0 project provide a fairly comprehensive picture of the current state of use of digital tools and the needs of the Italian educational sector.

Both the results of the survey and the information gathered by the mentors show that there is now a great commitment on the part of teachers to the use of new technologies and tools in didactics (preparation, communication and sharing of resources), as well as a willingness to train or update themselves.

It is clear that the use of content delivery platforms, learning analytics and artificial intelligence tools is growing strongly in the education sector, but many educators still lack adequate training and/or support within institutions (especially public ones). In particular, teachers have expressed an interest and need in the implementation of integration strategies - methodologies, continuous professional development, technological support and access to digital resources skills and knowledge. Despite the disparity in the availability and use of digital resources between different schools across the country, the need for a more unified and continuous approach to innovative digital education is highlighted by both the questionnaires and the mentor interviews.

Dideas, Spain

1. Introduction

During this phase, qualitative and quantitative research techniques were applied, especially surveys and interviews, in order to obtain information on the current educational needs in the Spanish space, related to the development of teaching and education 4.0. Thirty-six teachers and two experienced mentors participated, who collaborated with the completion of the requested information.
The questionnaire was distributed between 25/04/2024 and 8/05/2024 and was sent to teachers from different educational areas, in order to ensure a wide and diverse participation of teachers from universities, VET, secondary education, formal and non-formal adult education, etc.
The questionnaire addressed to teachers was circulated online through different communication channels by means of the following link: *https://forms.gle/t2C6HhbWcSBqnAyo6*
While the responses from the interviews of two experienced mentors in education 4.0: were retrieved through the following form: https://forms.gle/JWRWpZnaC4bJYAsT8

2. Analysis of the results of the surveys conducted

2.2 Surveys to teachers

The age ranges with the highest number of participants were distributed as follows: 30-39 years old with 33.3% (12 participants), 40- 49 years old with 33.3% (12 participants) and 50- 59 years old with 16.7% (6 participants). This was followed by 5.6% under 25 years old (2 participants), 8.3% between 25 and 29 years old (3 participants) and only one participant over 60 years old.
By gender, there was 41.7% female participation (15 participants) and 55.6% male participation (20 participants).
According to their professional background, 38.9% of teachers (14 participants) and 47.2% of trainers (17 participants) participated. Also 5.6% (2 participants) of students to become teachers, 1 pedagogical designer, 1 academic administrator and 1 learning support educator participated, representing 2.8% in each case.

The 50% of the participants reported that they use "very often/daily use" different digital tools in the educational space, 36.1% stated that they use them "often/2-3 times per week", while 11.1% only use them "sometimes/1 time per week".
Typically 80% of respondents use digital tools for content delivery: platforms and resources for presenting educational material, such as learning management systems (LMS) and educational websites (e.g. Teams, Moodle, Google Classroom, wikiwijs, Open Educational Resources). On the other hand, 62.9% use it for assessment and feedback activities: tools to

evaluate student performance, provide feedback and grade assignments (e.g., Google Forms, Jotform, goformative, edpuzzle, quizizz, lessonup). While 51.4% use it to support collaboration and communication activities: applications that facilitate interaction among students and between students and teachers (e.g., Mentimeter, Teams, google app suite, peardeck, Canvas, gamma.app, nearpod, trello, fibery, basecamp).

Most of the respondents (77.1%) learned to use digital tools through self-learning, while 34.3% did so through a postgraduate training course and another 34.3% did so through peer learning. Among them, 13.9% (5 participants) perceive themselves as having an "excellent" preparation in digital skills; 36.1% (13 participants) evaluate their level of digital skills as "very good"; 41.7% (15 participants) qualify it as "good", while 8.3% (3 participants) evaluate it as "average".
On the other hand, 55.6% of the participants insist on the need to improve their digital skills "to the full extent" and 41.7% want to do so "to a great extent".
Among the digital devices and general uses of digital tools most used by respondents are electronic records, laptops and tablets, with the use of graphic whiteboards, pens, tablets, interactive monitors and interactive multimedia whiteboards being a minority.

Among the elements that respondents refer to the importance of the use of digital tools in the educational space, are: increased productivity, capture the attention of students and promote the efficiency of the training process, facilitate the learning of students and the preparation of activities by the trainer, the speed to prepare, evaluate and measure content and the need for both trainers and students to adapt to these tools that are becoming increasingly important in different spheres of life.
On the other hand, they have indicated with ratings of 4 and 5 (Likert scale) in a majority way, the following needs in which it is necessary to continue working to improve the use of digital tools in the educational space. These include:

- *The need for digital tools and resources to improve teaching and learning.*
- *Training and education on the effective integration of technology in the classroom.*
- *Student access to appropriate technology devices*
- *The technical support and maintenance of the school's digital infrastructure*
- *Designing strategies to ensure equity and digital inclusion of students*
- *The development of clear policies and guidelines for the use of technology in education.*
- *Strategies that favor the integration of technology to facilitate learning assessment and feedback*

3. Findings from the interviews conducted to the two experienced mentors in education 4.0

Two mentors from the educational field were interviewed in order to obtain feedback from professionals with vast experience in the use of digital tools. In this way participated the university professor Miquel Ortells, specialized in Economics with more than 7 years of

experience in the sector, as well as Jorge Prieto, who works as a teacher in special education and has more than 4 years of experience in such activities.

Interviewees indicated frequent use of the following **innovative digital tools:**
- The use of online learning platforms, such as Moodle or Canvas. These platforms allow organizing course content in a clear and accessible way, assigning assignments and exams, and facilitating communication with students in an effective way.
- Use of videoconferencing tools such as Zoom or Microsoft Teams to conduct online classes in real time. These tools are especially useful for maintaining student interaction and engagement, even when they are learning remotely. They can also be used to host one-on-one tutoring sessions and group meetings, facilitating communication and collaboration outside of the physical classroom.
Another beneficial tool is the use of real-time collaboration platforms, such as Google Docs or Microsoft OneNote. These tools allow students to collaborate on projects in real time, share ideas, and make simultaneous edits to shared documents. This fosters collaboration among students and enhances their ability to work as a team, even at a distance.
-In terms of assessment and feedback, they use tools such as Turnitin to detect plagiarism and Rubric for assessing student work to establish clear evaluation criteria.
-A particularly useful tool is Read&Write, a reading and writing program that offers support for text comprehension, pronunciation and writing with the help of read-aloud functions and dictation tools.
-Also augmentative and alternative communication applications, such as Proloquo2Go, which enable students with speech difficulties to communicate effectively using symbols, images and predictive text.
-In addition, there are online educational platforms, such as Seesaw or ClassDojo, which facilitate communication with parents and collaboration between teachers and therapists. These digital tools not only help to personalize learning for the individual needs of students, but also encourage their independence and participation in the classroom.

Main needs that Interviewees identified as a teacher in relation to digitization in the school environment:
- The need to ensure equitable access to technology.
- Provide adequate training and capacity building for the effective use of digital tools.
- Design accessible digital content, protect the security and privacy of student data, and promote participation and engagement in the digital school environment. These areas are critical to maximizing the potential of digitization in education and ensuring an inclusive and effective learning experience for all students.
- Need that all kids should have access to the technology tools they need, you know, like tablets or specific software.
- Teachers need to learn how to use these tools effectively.
- It's super important that all the material used is accessible to all students, including those with special needs.
- Technical support is needed to solve problems when they arise.

Respondents reported the following positive results from the use of digital tools in an educational environment:
- Increased accessibility, flexibility in learning, enhanced interaction, personalization of learning and improved feedback.
- These tools make educational content more accessible and adaptable to individual learner needs, encourage greater interaction with each other and with the educational material, and facilitate rapid and effective delivery of feedback.
-Learning is more interactive and engaging for learners, which can increase their motivation and engagement with the material.
- Digital tools allow for greater personalization of learning, adapting to the individual needs of each learner and providing opportunities for practice and feedback tailored to their skill level.
- Encourage collaboration among students, both inside and outside the classroom, promoting teamwork and collaborative learning.

According to the interviewees and taking into account the target groups with which the different educational centers work, the process of using digital tools in education involves the identification of needs, selection of appropriate tools, integration into the curriculum, training and support, as well as continuous evaluation. When implemented effectively, this process can help achieve educational goals by enhancing the learning experience for students. However, success depends on the careful selection of tools, their consistent integration into the curriculum, appropriate training, and ongoing evaluation of the impact on learning. When carried out in a careful and thoughtful manner, this process can be very effective in enhancing students' educational experience and helping them achieve their learning objectives.

Regarding whether schools provide the necessary training to implement the effective use of technology and digital tools, interviewees stated that if schools do not provide the necessary training in educational technology, a needs assessment should be conducted to identify the areas of training required. Then, practical training programs and digital educational resources could be developed, in addition to fostering collaborative learning among teachers. It is crucial to integrate the use of technology into the school culture by creating communities of practice and holding events related to educational technology. This would ensure that educators are well prepared to integrate digital tools effectively into the educational process....
Particularly, one of the interviewees refers that sometimes the training he receives is a bit generic and not always adapted to the needs of special education teachers. More practice with digital tools and also continuous follow-up and support after the initial training could be beneficial.

4. Conclusions

Digital tools have significantly transformed the educational landscape, offering new opportunities and challenges. In the context of Spain, their proper integration can enhance educational quality, foster inclusion and improve students' digital competencies. Below are some conclusions drawn from the questionnaire and interviews conducted in order to obtain updated information to optimize the use of digital tools in education:

- Digital tools can reduce educational gaps by providing access to high-quality educational resources and materials, regardless of geographic location. However, it is essential to ensure that all students have access to devices and a reliable internet connection.
- Technology makes it possible to personalize education by tailoring content and pace of learning to the individual needs of each student. This can improve motivation and academic performance.
- The use of digital tools in the classroom prepares students for an increasingly digitized world, equipping them with essential skills for their future work and personal lives.
- For technology integration to be effective, it is crucial that teachers receive continuous and adequate training. This will enable them to use digital tools effectively and make the most of their educational potential.
- Digital platforms facilitate interaction and collaboration among students, as well as between students and teachers, fostering more dynamic and participatory learning.

In the specific case of the Spanish context, it is necessary to work in several areas in order to exploit the potential of the use of digital tools in the educational context. To this end, it is important to ensure that all schools, especially in rural areas, have the necessary infrastructure (equipment, Internet connection) to implement digital tools effectively. Continuing education programs should be established to train teachers in the use of digital tools and their integration into their teaching methodologies. It is essential to promote the creation and distribution of high quality digital educational content in Spanish, adapted to the national curriculum and the specific needs of Spanish students. Similarly, it is essential to implement policies that ensure the digital inclusion of all students, providing devices and Internet access to those who lack economic resources. Evaluation mechanisms should also be established to monitor the impact of digital tools on learning and adjust strategies according to the results obtained. At the same time, it is important to foster a digital culture in schools that not only focuses on the use of technology, but also on the teaching of digital skills, cybersecurity and ethics in the use of the Internet. Finally, it is a priority to involve parents, students and other stakeholders in the educational community in the implementation of digital tools, ensuring that they understand their benefits and actively participate in their use.

Malta

1. Introduction

The study employed a mixed-methods approach, combining an online questionnaire with face-to-face mentor interviews to gather comprehensive data on the use and impact of digitaltools in education among teachers and trainers in Malta.

Online Questionnaire

The online questionnaire was administered to 35 respondents, all of whom are teachers and trainers based in Malta. This group was chosen to ensure a relevant and focused insight intothe educational practices and needs within the region.

Design and Distribution

The questionnaire was designed to capture quantitative and qualitative data, consisting of both multiple-choice and open-ended questions.

Key areas covered included demographic information, professional experience, use and frequency of digital tools, self-assessment of digital skills, and specific needs and preferencesregarding digital education tools.

The questionnaire was distributed via email and educational networks, ensuring ease of access and encouraging participation.

Data Collection

Responses were collected over a period of two weeks.

The survey platform used ensured data security and anonymity, encouraging honest andcandid responses.

Face-to-Face Mentor Interviews

Interview Structure

The interviews were conducted in a private and comfortable setting to ensure the participants felt at ease. Each interview lasted approximately one hour and was recorded with the consent of the participants to ensure accuracy in data collection Participants - Two mentor interviewswere conducted face-to-face. These mentors were selected based on their extensive experience and expertise in the integration of digital tools in education.

The interviews were semi-structured, allowing for in-depth exploration of key themes while also providing flexibility to probe further into specific areas of interest.

Topics discussed included the mentors' experiences with digital tools, challenges faced in their implementation, and recommendations for best practices.

2. Analysis of the results of the surveys conducted

The combination of quantitative data from the online questionnaire and qualitative insights from the mentor interviews provided a comprehensive view of the current state and future needs of digital education tools among teachers and trainers in Malta. This methodology ensured a balanced approach, capturing both broad trends and detailed personal experiences.

Quantitative Data

Responses from the online questionnaire were analyzed using statistical methods to identifypatterns and trends. Descriptive statistics provided an overview of the frequency and distribution of responses, while inferential statistics helped in understanding the relationships between different variables.

Qualitative Data

Open-ended responses from the questionnaire and transcriptions from the mentor interviewswere analyzed using thematic analysis. Key themes and insights were identified, providing a deeper understanding of the context and nuances behind the quantitative data.

3. Surveys to teachers

The survey results show a diverse distribution of respondents across various age ranges. This distribution highlights a broad spectrum of participants, with a significant concentration in the 30-49 age range, ensuring a well-rounded perspective from different age demographics. The age range with the highest number of respondents is

- 40-49 10 respondents
- 30-39 9 respondents
- 50-59 5 respondents
- Above 60 5 respondents
- 25-29 3 respondents
- Below 25 3 respondents

There are 24 females and 11 males, reflecting the allocation of males to females in the teaching sector in Malta.

The survey results indicate the following distribution of professional experience among respondent

- More than 15 years 17 respondents, suggesting a significant proportion of highlyexperienced professionals.
- 7-10 years 5 respondents, indicating a considerable presence of mid-career professionals.
- 1-3 years, 4-6 years, and 10-15 years 4 respondents each, showing a balanced representation of early-career and moderately experienced professionals.
- Less than 1 year 1 respondent, highlighting a minimal presence of newcomers in thefield.

The survey results show a diverse distribution of subjects taught or specialized in by the respondents, including the linguistic field, pedagogical-social field, Nursing, Scientific field, eSports and Game Design, Executive Business English, Economic-administrative field, English, Inclusive education, Artistic-expressive field, Technological field, Social emotional behavioral field, and History and Maltese as a Foreign Language.

The majority of respondents, totaling 22 who replied to this specific question , use digitaltools very often or on a daily basis

- Very often / daily use 22 respondents
- Often (2-3 times per week) 6 respondents
- Sometimes (once a week) 5 respondents
- Rarely (1-2 times per month) 2 respondents

Overall, the data highlights that content delivery platforms are the predominant innovative digital tools used by respondents, followed by learning analytics tools, collaboration and communication applications, and assessment and feedback tools. This distribution reflects the emphasis on delivering educational content effectively while also incorporating data analytics and interaction tools to enhance the learning experience.

- Content Delivery 28 respondents
- Learning Analytics tools 4 respondents
- Collaboration and Communication 2 respondents
- Assessment and Feedback 2 respondents

The survey results reveal a variety of reasons why respondents use digital tools in their teaching and professional activities.

Communication - Many respondents use digital tools to facilitate communication with students, parents, and team members. This includes obtaining feedback, managing student progress, and sharing information and resources.

Enhancing Lessons and Learning - Digital tools are used to enhance the lesson and learning experience, making lessons more interesting, relevant, and effective, often incorporating multimedia elements, interactive activities, and adaptive resources.

Assessment and Feedback - Digital tools simplify the process of evaluating performance and offering constructive feedback.

Efficiency and Productivity - Respondents highlighted efficiency and productivity gains from using digital tools, simplifying tasks, saving time, and making daily jobs less mundane and more efficient.

Innovation and Engagement - Digital tools are appreciated for their innovative nature, making lessons fun and interactive, enhancing engagement, and personalizing learning experiences.

1. Online Teaching Several respondents mentioned using digital tools for online teaching, ensuring standard delivery and managing classes effectively.
2. Convenience Digital tools facilitate various tasks, such as analyzing students in esports,interacting better with students, and keeping everything organized neatly.
3. Visual Appeal Creating visually appealing content and making learning points moreimpactful.
4. Necessity and Workflow For some respondents, using digital tools is necessary to easetheir workflow and manage tasks efficiently.
5. Interactive and Modern Classrooms Digital tools bring a different element to modernclassrooms, making lessons interactive and engaging for students.
6. Project Management and Collaboration Tools for project management, c
7. collaboration, and content creation with AI are extensively used in educational work.

Overall, self-learning is the predominant method, reflecting the importance of personal initiative and independent learning in mastering digital tools. Peer-learning also plays a significant role, underscoring the benefits of collaborative and social learning contexts. Formal education and training courses contribute to a lesser but still notable extent.

- Self-learning 30 respondents
- Peer-learning 17 respondents
- Post-grade training course 5 respondents
- Study career (university) 4 respondents.
- Friends and colleagues 1 respondent

Availability and Usage of Digital Devices in Schools

- Interactive Multimedia Whiteboards
    - Equipped, Use 23 respondents.
    - Equipped 5 respondents.

- Tablets
    - Equipped, Use 6 respondents.
    - Use 4 respondents.
    - Equipped 2 respondents.

- Electronic Registers
    - Equipped, Use 8 respondents.
    - Equipped 1 respondent.

- Computers (notebooks)
    - Equipped, Use 15 respondents.
    - Use 2 respondents.
    - Equipped 5 respondents.

- Graphic Boards, Pen Tablets, and Pen Displays
    - Equipped, Use 9 respondents.

Respondents' Self-Assessment of Their Digital Skills

- Very Good 16 respondents
- Good 10 respondents
- Fair 7 respondents
- Poor 2 respondents
- Excellent 1 respondent

Respondents' Desire to Improve Their Knowledge of Digital Education Tools

- To a very high extent 17 respondents
- To the full extent 14 respondents
- To some extent 7 respondents

Ratings for Various Aspects of Digital Education (5 being the highest, 1 the lowest)

1. Training and education on effective technology integration in the classroom 4.49
2. Technical support and maintenance of digital infrastructure in the school 4.46
3. Tools and digital resources to enhance teaching and learning 4.43
4. Development of clear policies and guidelines for technology use in education 4.31
5. Integration of technology to facilitate assessment and feedback of learning 4.20
6. Strategies to ensure equity and digital inclusion among students 4.17
7. Access to suitable technological devices for students 4.06

The analysis reveals a strong emphasis on training and technical support as the most critical aspects for respondents. The survey responses under "Other needs" provide additional insights into the needs and suggestions from the respondents. The additional feedback underscores the importance of equitable access to digital tools, the need to ensure students possess fundamental digital competencies, and the value of teaching educators how to effectively connect with and inspire students using digital content. These insights point to the need for continuous professional development, targeted training programs, and a focus on digital literacy to enhance the overall educational experience.

3. Findings from the interviews conducted to the two experienced mentors in education 4.0

Introduction to the Mentors

George Galea, Headmaster San Gorg Preca Secondary, Hamrun. George Galea began his career in education as a technician within a school whilst holding a higher technician diploma in mechanical engineering. He entered the teaching world as a supply teacher where he then decided to continue his studies and obtained a B. Educ in Design and Technology. He eventually pursued a Masters in Educational Leadership. Galea has held the position of Headof School for the past 2 years where he leads a team of 120 educators with 450 students attending the school.

Lenny Bruno, Video Game Developer/AI Architect/Game Dev Educator. Lenny started his studies in Game development at MCAST through an Undergraduate Diploma in Video Game Development and continued with a Bachelor of Science (Honours) in Digital Games Development. He is currently sitting for a Master In Artificial Intelligence For Industry 4.0. Lenny started teaching game development entry level courses 3 years ago.

Summary of Interview Feedback

The interview feedback provides valuable insights into the use and impact of digital tools in educational environments. The 2 respondents are from different age ranges, y 30-39 and 40-49, both male. One is a headmaster, while the other is a teacher and game developer , each bringing unique perspectives based on their roles. Their professional experience varied, withone having 1-3 years of experience and the other 7-10 years. They specialized in diverse fields,with one focusing on administrative responsibilities and the other on game development.

The use of digital tools is a crucial aspect of both respondents' educational environments.

The headmaster highlighted the extensive use of Microsoft Teams for setting up digital classrooms, posting materials, conducting assessments, and managing discussions. This tool, initially adopted during the COVID-19 pandemic, remains integral for maintaining student-teacher communication and engagement. Additionally, tools like Kahoot! and Quizlet are employed to make learning fun and interactive, further engaging students in the learning process.
The game development instructor uses Unity, a game development engine, to provide authentic and self-guided learning experiences. The integration of AI systems has also been arecent development, reflecting the evolving nature of the industry and the need for studentsto stay current with technological advancements.

Both respondents expressed comfort in using digital tools, albeit with an understanding thatcontinuous learning and adaptation are necessary.
The headmaster emphasized that digital tools have become integral to their administrative and teaching processes, enhancing efficiency in tasks such as tracking attendance and studentprogress. Continuous training and professional development have been crucial in maintaining this comfort level, benefiting both staff and students.
The game development instructor, while acknowledging initial challenges with certain applications, stressed the importance of perseverance and the learning process inherent in mastering digital tools.

The respondents identified several key needs for effective digitalization in their school environments. The headmaster underscored the importance of robust infrastructure, including reliable internet and modern technology like interactive panels in classrooms. Continuous training and support for both teachers and students were also deemed vital to effectively use digital tools. Ensuring data security and compliance with GDPR was highlighted as a priority, along with providing equal access to technology for all students to promote inclusivity.
In the context of game development, the instructor emphasized the necessity of staying current with technological advancements, such as graphic cards, processors, and UI devices like AR, VR, and XR, viewing digitalization as an ongoing process rather than a one-off project.

The outcomes of using digital tools in education were broadly positive.
The headmaster noted that digital tools have transformed teaching methods, making lessonsmore interactive and engaging. They align with the digital reality of students, who are digital natives, thus enhancing the relevance and effectiveness of education. Digital tools have also significantly improved accessibility, enabling participation from students with different needs, such as those who are hearing or visually impaired.
The game development instructor echoed these sentiments, stating that digital tools are fundamental to their educational process, with almost all tasks and demonstrations carried out using digital applications.

Both respondents emphasized a needs-based approach to using digital tools.
The headmaster explained that the process begins by identifying the specific needs of student groups, such as increased engagement, collaboration, or access to

information. Appropriate digital tools are then selected to meet these needs, with positive feedback from both students and teachers indicating that the objectives are largely achieved.
The game development instructor follows an experiential and experimental approach, starting with a relatable context or problem for students. This creates a need or urge to learn, after which the tool and its functions are introduced. This method encourages students to solve problems using the available tools, fostering a deeper learning experience.

Knowledge sharing among colleagues is an integral part of the digitalization process.
The headmaster highlighted the necessity of regular personal development days, which include training sessions and sharing best practices.
The game development instructor pointed out the collaborative nature of the tech community, leveraging online forums and platforms like GitHub, Discord, and Reddit for ideasharing and problem-solving.
Both interviewees noted limited opportunities for sharing practices directly with colleagues due to the structure of their work setup

The respondents acknowledged the importance of ongoing training. The headmaster mentioned that while formal training sessions are not frequent due to the educational framework , there is an effort to create an environment where teachers regularly share materials and experiences. Training sessions are typically held once per term, with longer sessions at the end of and prior to the start of the school year. The game development instructor recalled initial training on interactive whiteboard software but noted the institution's support for joining external courses and training programs.

Overall feedback clearly reveals that digital tools are deeply embedded in the educational processes of both respondents, enhancing engagement, accessibility, and overall educational outcomes. Continuous learning and adaptation are crucial for both teachers and students, emphasizing the need for ongoing training and support. The holistic approach to identifying and addressing the specific needs of different student groups ensures that digital tools are used effectively to achieve educational objectives. Both respondents highlight the importance of robust infrastructure and staying current with technological advancements, which are critical for maintaining a relevant and effective educational environment. The emphasis on inclusivity and data security reflects a comprehensive understanding of the broader implications of digitalization in education. By ensuring equal access to technology and protecting student data, the respondents demonstrate a commitment to creating a safe and supportive learning environment for all students. The use of innovative tools like Microsoft Teams, Kahoot!, Quizlet, and Unity underscores the potential of digital tools to transform teaching and learning, making education more interactive, engaging, and aligned with the realities of today's digital world.

The feedback clearly underscores the transformative potential of digital tools in education. Ithighlights the importance of continuous professional development, robust infrastructure, and a strategic approach to integrating digital tools into the educational process. By

focusing on the specific needs of students and fostering a collaborative learning environment, schools can effectively leverage digital tools to enhance educational outcomes and prepare students for the future.

4. Conclusions - recommendations on a Malta national level

Enhance Training and Professional Development

1. Invest in continuous professional development programs focusing on effective technology integration.
2. Facilitate frequent training sessions and workshops on new digital tools and technologies, especially those that are relevant to the diverse range of subjects taught.

Improve Technical Infrastructure

1. Ensure that all schools have robust internet connectivity and modern digital infrastructure, including interactive whiteboards, tablets, and computers. This will support the frequent use of digital tools highlighted by respondents.
2. Provide ongoing technical support and maintenance to ensure that digital tools and infrastructure are always in optimal condition.

Promote Equity and Digital Inclusion

1. Implement strategies to ensure all students have equal access to digital tools and resources. This includes addressing the digital divide by providing necessary devices and internet access to underserved students.
2. Develop clear policies and guidelines that promote digital equity and ensure compliance with data protection regulations such as GDPR.

Foster a Collaborative Learning Environment

1. Encourage peer-learning and collaborative learning environments where teachers andstudents can share best practices and learn from each other.
2. Leverage online platforms and forums for knowledge sharing and support among educators.

Focus on Digital Literacy

1. Integrate digital literacy into the curriculum to ensure that students develop fundamental digital competencies. This is crucial for preparing them for the digital world.
2. Provide targeted training programs that focus on teaching educators how to effectively use digital tools to inspire and engage students.

Utilize Innovative Digital Tools

1. Encourage the use of content delivery platforms, learning analytics tools, collaboration and communication applications, and assessment and feedback tools toenhance the learning experience.
2. Promote the use of innovative technologies such as AI and VR to create immersive andengaging learning experiences.

Address Specific Needs and Challenges

1. Tailor digital tool usage to address the specific needs of different student groups, ensuring that tools are selected based on identified needs such as engagement, collaboration, or access to information.
2. Continuously evaluate and update the digital tools and technologies used in schools to keep pace with technological advancements and industry trends.

DIGITRANER 4.0
Upskilling Trainers to Education 4.0

WP2.3

Collection of good practices

Project Number 2023-1-NL01-KA220-VET-000153434
May 2024

Name of best practice	AR4STE(A)M
Links	http://www.ar4steam.eu/index.php/
The name of the organization that developed it and its promoter and/or owner, whether it exists.	DIPF I Leibniz Institute for Research and Information in Education supports educational research, educational practice, educational policy and educational administration on the basis of scientific infrastructure services as well as research and educational system evaluations. Partners: - AEDE is a German network of more than 10,000 teachers, heads, inspectors and officials in 21 national sections, from nursery school to university level. - Effebi Association is an italian non-profit Association, reference point for people involved in the management and development of HR and organizational models. - Hearthands Solutions (HESO) is a dynamic consultancy offering a vast range of services bridging the gap between the commercial and public/EU funding ecosystems. - ITT Marco Polo is a public upper secondary school based in Florence, which addresses a technical education for Tourism. - Niekée school consists of two different learning concepts: Niekée VMBO (Vocational Education) and Agora (secondary education). - Satom is a technical and vocational school in İstanbul.
Location (*Country, City*)	Germany, Italy, Cyprus, The Netherlands, Turkey
Description of good practice	The purpose of AR4STE(A)M is to raise awareness of young students, about the importance of choosing STE(A)M studies for pursuing successful STE(A)M careers. In particular, the project aims at encouraging secondary schools to integrate immersive technologies and game-based learning in educational programs. Furthermore, the project seeks to foster school teacher's capacity to teach STE(A)M effectively, by the creation of an effective training, which will help teachers in using innovative ICT technologies during their STE(A)M lessons.
Impacts and Benefits ***(impact on the environment, education etc; Benefits and related challenges about its usage)***	- Promote the integration of immersive technologies and game-based learning in educational programs - Motivate students to actively participate in STE(A)M lessons and activities - Empower students to pursue a career path related to

	STE(A)M studies - Promote the use of AR and gamification techniques in STE(A)M curriculums - Raise awareness of the benefits of STE(A)M studies
Sustainability, social, financial, innovative, technological benefits	The project will come up with the following tangible results: - Compendium of gamification strategies based on Augmented Reality for STE(A)M learning: An analysis of the existing Augmented Reality (AR) games and AR technologies, that have been contributed to game-based learning (GBL) activities for STE(A)M learning in upper secondary schools programmes. - Online Teacher Training Programme: An online training programme for school teachers in secondary education, aiming at provide them with the necessary skills and competences in order to learn how to use AR based gamified approaches when teaching STE(A)M. - Innovative STE(A)M laboratories: Development of the STE(A)M laboratories in different schools, which will engage students in activities based on innovative technologies (AR) and stimulating learning methodologies (game-based learning).
Target group/End-users	Students and teacher of secondary schools
Other comments/images	AR4STE(A)M

Name of best practice	ELSS PROJECT
Links	https://www.elss-project.eu/en/project.html
The name of the organization that developed it and its promoter and/or owner, whether it exists.	AIDP, the Italian Association for People Management, is a non-political and non-profit organization whose members are managers and professionals active in the field of human resources. Confapi stands for development of Small and Medium Industries (SMEs), safeguarding their interests and promoting at political level actions aimed at national and international development of associated industries. Finance & Banking, Organisational & HR development Association (EFFEBI Association) is a non-profit organization, reference point for people involved HR management and development and organizational models. PAIZ Konsulting Sp. z o.o. has experience in designing and delivering ICT based educational solutions culminated in partnership in the project to develop an online service to improve communication skills in the workplace using branching stories games. PROMEA is the Hellenic Association for the promotion of Research & Development Methodologies, and aims at the promotion of knowledge society in Greece and Europe.
Location (*Country, City*)	Italy, Poland, Greece
Description of good practice	The ELSS project aims at creating a more flexible and effective educational solution in C-VET: an online system supporting the transfer of learning effects into the workplace. The solution designed within the project has significant signs of innovation in its approach to learning, addressing not only the training event but also learner preparation to learn and post learning activities. The goal is increasing the effectiveness of implementation of newly developed skills, gained during trainings organized by companies for their employees at the same time fostering mainstreaming and spreading the utilisation of open and innovative education.
Impacts and Benefits *(impact on the environment, education etc; Benefits and related challenges about its usage)*	The ELSS system is an online service supporting the learning implementation process through pre learning, learning and post learning tasks. It can be linked to any e-learning module as well as traditional classroom training as part of blended learning experience. The system serves several purposes the ultimate being increase of learning retention and new skills implementation into the workplace. ELSS is a fully functional platform. It contains methodologies for planning the learning

	enhancement and implementation process and uploading content into the system. The ELSS with imbedded e-learning communication skills training - online service with multitude of activities supporting implementation into the workplace of the skills and knowledge apprehended by end users (trainees) during an e-learning traning.
Sustainability, social, financial, innovative, technological benefits	The system will be an innovation for the target group, who uses rather dispersed learning support solutions, not as extensive and thorough as the planned one. Furthermore, it will give companies the opportunity to upload their content and use the system in connection with their in house training activities, while available systems are only built around the trainings offered by external providers. Open access to the system will reduce costs of training initiatives in companies, especially when based on e-learning modules owned by companies to which the system can be linked, apart from classroom trainings. This can lead to higher availability of trainings in companies, enhancing access to training for a greater number of employees (savings in time and money). The Partnership fosters synergy between business and research and development sectors, which is also an important aspect of the horizontal priority: "Open and innovative education, training and youth work, embedded in the digital era".
Target group/End-users	Company employees
Other comments/images	ELSS

Name of best practice	iSURVIVE
Links	https://www.isurviveproject.eu
The name of the organization that developed it and its promoter and/or owner, whether it exists.	▪ Warsaw University of Life Sciences, Poland ▪ DIMITRA Education and Consulting, Greece ▪ Centre for Research and European Studies, Italy ▪ International Telematics' University UNINETTUNO, Italy ▪ ITPIO, Bulgaria ▪ The University of National and World Economy, Bulgaria ▪ Folkuniversitetet, Sweden
Location (*Country, City*)	Poland, Greece, Italy, Bulgaria, Sweden
Description of good practice	The project will provide a system to guide and train academics and lecturers in HE in creating online content which will achieve the expected learning outcomes by boosting student engagement and their motivation to learn. Thus, the project will prevent the students from the risk of "pretend attendance" and stress induced by the lack of personal interactions.
Impacts and Benefits *(impact on the environment, education etc; Benefits and related challenges about its usage)*	The project envisages the below long term impact: 1) Improved competencies of Higher Education 2) Increased online course delivery in Europe 3) Improved quality of online learning (synchronous and asynchronous) 4) Enhancement of the eLearning courses positive aspects 5) Conversion of eLearning from necessity and "needs to be" into motivating and exciting 6) Provision of access to high quality learning to all including people living in rural and secluded areas
Sustainability, social, financial, innovative, technological benefits	To develop the competences of HE academics to prepare them to convert their lectures and face to face courses, into effective online ones. Indeed, the project will provide a system to guide and train academics and lecturers in He in creating online content which will achieve the expected learning outcomes by boosting student engagement and their motivation to learn.
Target group/End-users	The primary target group is HE lecturers and academics, in order to also benefit the secondary target group of HE students.

Other comments/images	

Name of best practice	DiCTE – Digital Competence in Teacher Education
Links	DiCTE Project
The name of the organization that developed it and its promoter and/or owner, whether it exists.	Developed by Oslo Metropolitan University, with partners in Spain and other countries.
Location (*Country, City*)	Spain, among other participating countries.
Description of good practice	This project aims to integrate ICT in classrooms by enhancing newly qualified teachers' digital competencies. It uses the PEAT model (Pedagogical, Ethical, Attitudinal, Technological) to structure and improve digital competence.
Impacts and Benefits (*impact on the environment, education etc; Benefits and related challenges about its usage*)	The project enhances digital competence among teachers, facilitating more effective and modern teaching methods. It supports the professional development of educators by providing them with necessary digital tools and competencies.
Sustainability, social, financial, innovative, technological benefits	It promotes an integrated and sustainable approach to digital education and continuous professional development for educators.
Target group/End-users	Newly qualified teachers and education students.
Other comments/images	The project's framework and resources continue to benefit educational institutions by providing a structured approach to understanding and implementing digital competence.

Name of best practice	Learning Path – The Digitalised Learning Path for Educational Organizations
Links	Learning Path Project
The name of the organization that developed it and its promoter and/or owner, whether it exists.	Collaborative project among educational institutions from Austria, Denmark, Finland, Germany, and Portugal.
Location (*Country, City*)	Spain is part of this European network.
Description of good practice	Based on the European Framework for the Digital Competence of Educators, this project focuses on three main paths: Organizational Learning Path, Professional Learning Path, and Learning Path for Other Stakeholders. These paths are designed to enhance digital skills systematically across educational organizations.
Impacts and Benefits ***(impact on the environment, education etc; Benefits and related challenges about its usage)***	Facilitates access to an open platform rich with resources, enhancing digital competence across educational sectors. It directly addresses the digital skill gaps in educational settings.
Sustainability, social, financial, innovative, technological benefits	Provides a sustainable resource for ongoing improvement in digital skills within the educational sector.
Target group/End-users	Educators and administrators at educational institutions.
Other comments/images	The project has created a comprehensive resource platform that continues to be a valuable tool for educational organizations looking to improve their digital competencies.

Name of best practice	SMART-MT – Smart Mathematics Teacher
Links	SMART-MT Project
The name of the organization that developed it and its promoter and/or owner, whether it exists.	A consortium including Greece, Latvia, Lithuania, Poland, and Romania, with participation from Spain.
Location (*Country, City*)	Spain, as part of an international consortium.
Description of good practice	This project aims to improve digital competencies among mathematics teachers by encouraging the use of mobile apps in teaching. The goals include enhancing students' mathematical skills, fostering critical thinking and creativity, and addressing diversity in the classroom.
Impacts and Benefits (*impact on the environment, education etc; Benefits and related challenges about its usage*)	• **Educational Impact**: The use of mobile apps has proven to enhance engagement and understanding of mathematical concepts among students. Teachers report better student performance in math and increased interest in the subject. • **Teacher Development**: Participants have experienced substantial growth in their digital skills, with 85% of the teachers involved noting marked improvements. This is crucial for their adaptability and effectiveness in modern classrooms. • **Innovative Teaching Practices**: The project promotes innovative teaching methods that integrate technology, thus preparing students for a digitalized future.
Sustainability, social, financial, innovative, technological benefits	• **Resource Development**: The project has led to the creation of e-guides and mobile applications tailored to teaching mathematics, which are sustainable tools that teachers can continue to use and adapt. • **Sharing Best Practices**: Through workshops and collaborative networks, best practices in digital teaching are shared among educators across Europe, fostering a community of improved practice. • **Adaptability**: The digital tools and resources developed are designed to be adaptable across different educational contexts and needs, making them widely applicable. • **Target Group/End-Users**: The primary beneficiaries are

	mathematics teachers at various educational levels, along with their students. The project indirectly benefits educational administrators by providing them with modernized teaching resources. • **Other Comments/Images**: Feedback from the project highlights its success in bridging the gap between traditional mathematics teaching and modern technology-based methods. The resources developed under SMART-MT continue to serve as a benchmark for digital education in mathematics.
Target group/End-users	The primary beneficiaries are mathematics teachers at various educational levels, along with their students. The project indirectly benefits educational administrators by providing them with modernized teaching resources.
Other comments/images	Feedback from the project highlights its success in bridging the gap between traditional mathematics teaching and modern technology-based methods. The resources developed under SMART-MT continue to serve as a benchmark for digital education in mathematics.

Name of best practice	Essential Digital Skills CPD programme
Links	https://www.et-foundation.co.uk/professional-development/edtech-support/essential-digital-skills-eds-cpd-programme/
The name of the organization that developed it and its promoter and/or owner, whether it exists.	https://www.et-foundation.co.uk/professional-development/edtech-support/essential-digital-skills-eds-cpd-programme/
Location (*Country, City*)	UK
Description of good practice	The UK Department for Education (has introduced a new Essential Digital Skills (EDS) framework and associated national standards, which set out essential digital skills for life and work. The Essential Digital Skills CPD programme, provided by the Education and Training Foundation (ETF), aims to equip teachers, trainers, and leaders with necessary digital skills. The programme includes an interactive self-assessment tool, 20 online learning modules, CPD events, and an online community for peer support. It covers five key areas: using devices, creating and editing, communicating, transacting online, and online safety. All resources and training are free, funded by the UK Department for Education. The course does not meet the criteria being accessible to all due to not providing training in multiple languages, and the cost barrier,
Impacts and Benefits *(impact on the environment, education etc; Benefits and related challenges about its usage)*	Improving Digital Literacy: Enhancing the digital skills of educators, making them more proficient in using technology effectively in teaching. Encouraging Integration: Facilitating the incorporation of digital tools and resources into educational practices. Supporting Innovation: Enabling educators to innovate and adapt to new teaching methods and technologies. Promoting Confidence: Building confidence in using digital platforms, which can lead to more effective and engaging learning experiences. The success factors related to developing digital skills through the Essential Digital Skills CPD programme include: 1. Enhanced Competency: Improved ability to use digital devices, create and edit content, communicate, transact online,

	and ensure online safety. 2. Practical Application: Practical skills that can be directly applied in teaching and training environments. 3. Confidence Boost: Increased confidence in using digital tools and technologies. 4. Peer Support: Engagement with a community of practice for shared learning and support. 5. Flexibility: Access to a range of online modules and resources that can be completed at one's own pace.
Sustainability, social, financial, innovative, technological benefits	Fast-paced evolution of technology means that digital skills training cannot be a one-time event. Continuous learning and upskilling must be integral to an organization's culture to keep pace with technological advancements.: Efforts must be made to ensure that digital skills training is accessible to all, Replicability/ Transferability: Digital marketing skills such as SEO, content marketing, and analytics are transferable across industries, from tech startups to traditional businesses seeking an online presence. The course is designed to equip learners with skills that are applicable in a wide range of professional contexts. It encourages learners to adapt strategies to fit specific business needs, market segments, or customer behaviours, enhancing the transferability of the skills learned. Projects and case studies within the course that mimic real-world scenarios enable learners to apply their knowledge in diverse settings, increasing relevance and transferability of skills acquired. The replicability of the course ensures that high-quality, standardized training is accessible to a broad audience, while the transferability of the skills it teaches ensures that learners can adapt and apply these skills in various professional scenario.
Target group/End-users	Educators, including teachers, school administrators, and educational professionals seeking high-quality teaching resources and professional development opportunities. End-users: Students, who benefit from engaging and innovative learning experiences. Schools and educational institutions looking to enhance their teaching practices and improve student outcomes.
Other comments/images	

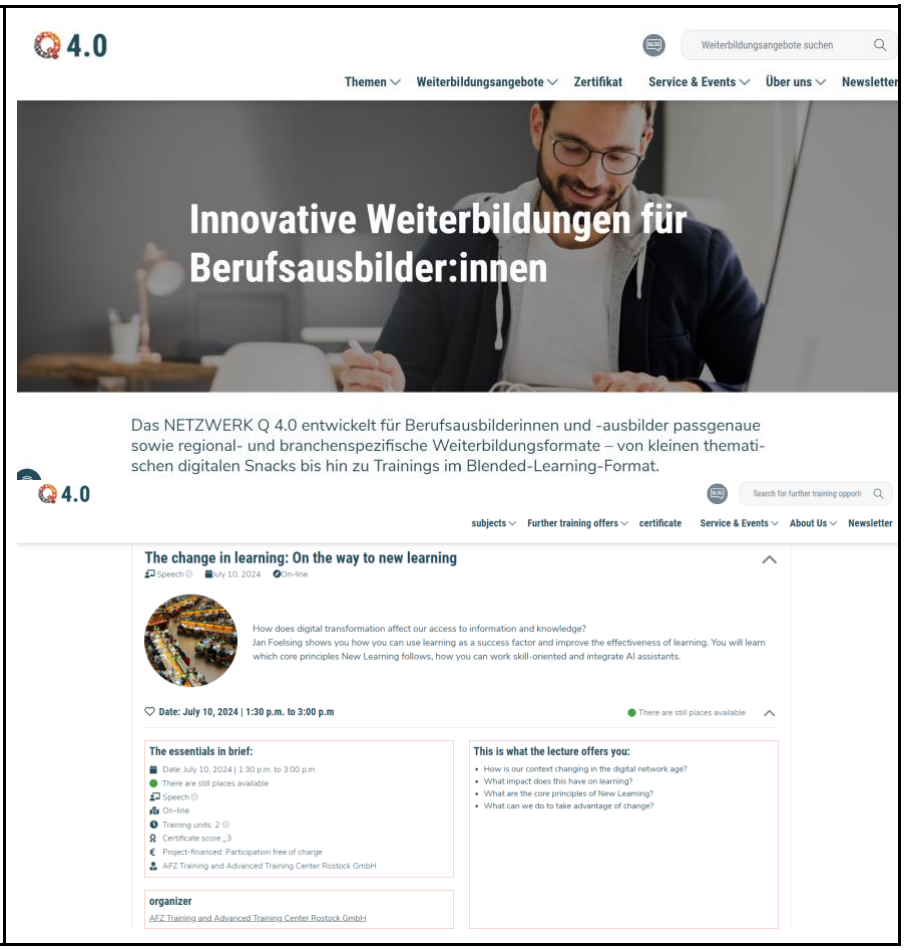
Name of best practice	**Tools4teaching**
Links	Tools4Teaching.eu
The name of the organization that developed it and its promoter and/or owner, whether it exists.	Erasmus+
Location (*Country, City*)	Malta , Netherlands, Spain , Sweden
Description of good practice	Tools4Teaching.eu is an online platform dedicated to providing high-quality educational resources, tools, and best practices for educators across Europe. The platform offers a comprehensive range of information related to interactive tools, to enhance teaching effectiveness and student learning outcomes.
Impacts and Benefits ***(impact on the environment, education etc; Benefits and related challenges about its usage)***	Impact on Education: • Enhances teacher effectiveness through access to diverse teaching materials and resources. • Improves student engagement and learning outcomes by integrating interactive and innovative tools. • Supports professional development and continuous learning for educators. • Fosters collaboration and sharing of best practices among educators across Europe. Impact on the Environment: • Promotes digital learning, reducing the need for physical materials and minimizing paper waste. • Encourages sustainable practices by offering eco-friendly teaching resources and activities. • Provides easy access to a wide range of high-quality educational resources. • Facilitates the adoption of innovative teaching methods. • Enhances professional growth and development for educators.
Sustainability, social, financial, innovative, technological benefits	Promotes inclusive education by offering resources that cater to diverse student populations. Encourages collaboration and knowledge-sharing among educators, creating a supportive professional community. Reduces cost of purchasing physical teaching materials by providing digital alternatives.

Target group/End-users	Educators, including teachers, school administrators, and educational professionals seeking high-quality teaching resources and professional development opportunities. End-users: Students, who benefit from engaging and innovative learning experiences. Schools and educational institutions looking to enhance their teaching practices and improve student outcomes.
Other comments/images	

Name of best practice	**Teaching Dunn Simply**
Links	www.teachingdunnsimply.com
The name of the organization that developed it and its promoter and/or owner, whether it exists.	Teaching Dunn Simply, LLC Dr. Debra J. Dunn
Location (*Country, City*)	US
Description of good practice	Teaching Dunn Simply is a comprehensive educational platform designed to simplify the teaching process for educators. It offers a range of resources, including lesson plans, instructional strategies, and professional development courses, all aimed at enhancing teaching effectiveness and student learning. The platform emphasizes simplicity, practicality, and accessibility, making it easier for teachers to find and implement high-quality educational materials. It aims to empower educators with the tools and resources they need to succeed, ultimately fostering a more effective and engaging learning environment for students.
Impacts and Benefits (*impact on the environment, education etc; Benefits and related challenges about its usage*)	**Impact on Education:** Simplifies the planning and delivery of lessons with ready-to-use resources. Improves student engagement through well-structured and effective teaching materials. Supports professional growth by providing access to practical and applicable instructional strategies. Encourages the adoption of best teaching practices across

	diverse educational settings. **Impact on the Environment:** Reduces the reliance on printed materials by offering digital resources, thereby minimizing paper waste. Promotes eco-friendly teaching practices through the use of sustainable resources and activities. **Benefits:** Streamlines the lesson planning process, saving time for educators. Provides a wide variety of resources that cater to different teaching styles and student needs. Enhances teacher confidence and effectiveness with practical and easy-to-implement strategies. Encourages continuous professional development with up-to-date courses and materials. Keeping resources current and relevant in a rapidly evolving educational landscape. Addressing the digital divide to ensure all educators have equal access to the platform.
Sustainability, social, financial, innovative, technological benefits	Fosters inclusive educational environment by providing resources that address diverse learning needs. Offers cost-effective resources that reduce the need for expensive textbooks and materials. Leverages technology to deliver engaging and interactive educational content. Integrates innovative teaching tools and methods to enhance learning experiences.
Target group/End-users	Educators, including teachers, school administrators, and educational professionals seeking high-quality teaching resources and professional development opportunities. End-users: Students, who benefit from engaging and innovative learning experiences. Schools and educational institutions looking to enhance their teaching practices and improve student outcomes.
Other comments/images	

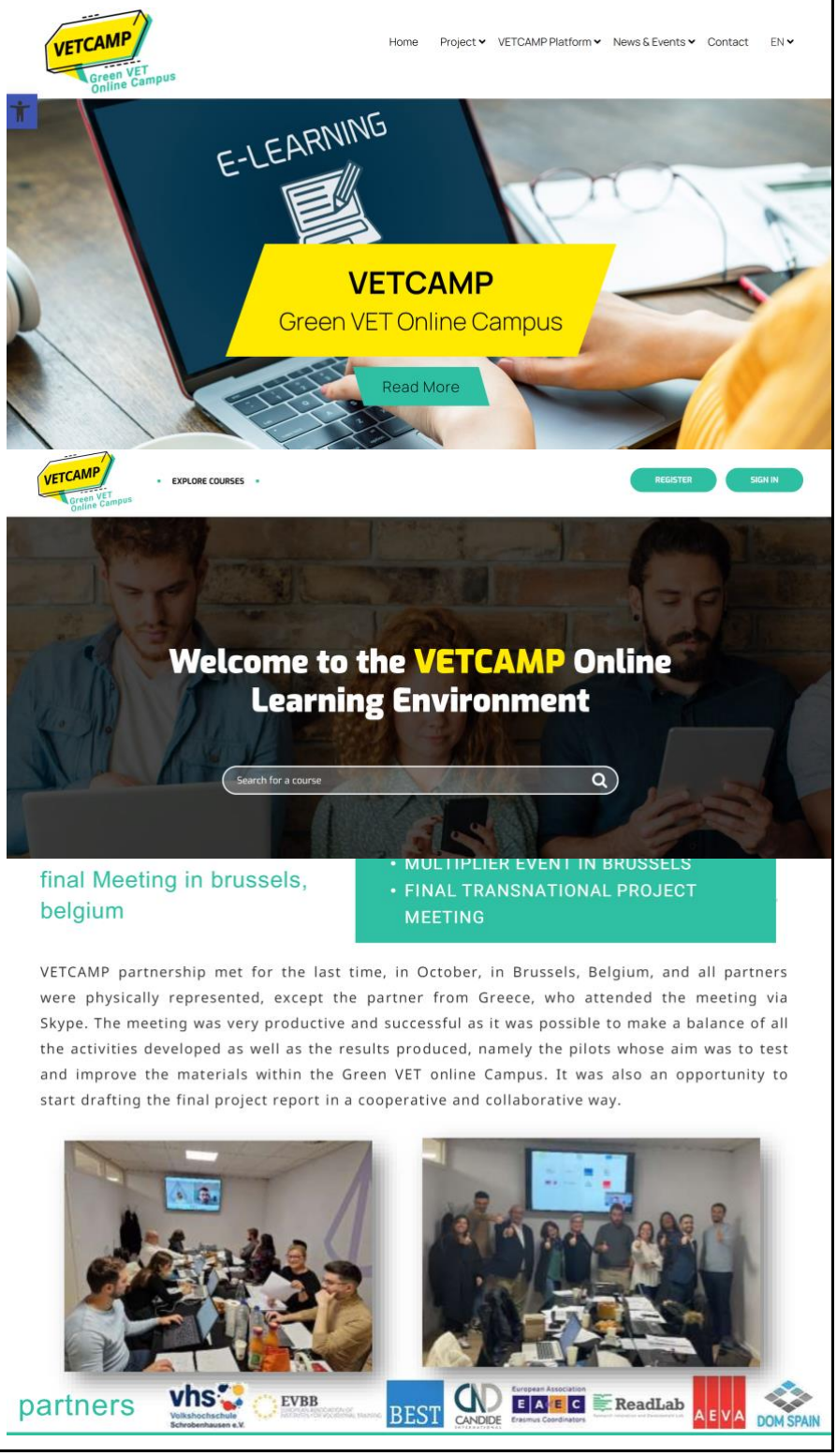
Name of best practice	Digitaler Wandel Q 4.0
Links	https://netzwerkq40.de/
The name of the organization that developed it and its promoter and/or owner, whether it exists.	BWHW, BWU, BWNRW, BBW, BNW, BILDUNGSWERK, BWSA, TECHNISCHE AKADEMIE NORD, BW, AUS-UND FORTBILDUNGS-ZENTRUM, BSW, BILDUNGSWERK DER THURINGER WIRTSCHAFT E.V., IW
Location (*Country, City*)	Germany
Description of good practice	This initiative supports the qualification of teachers and trainers for the digitalized world of VET. It focuses on developing specific qualification programs primarily for in-company trainers as well as VET school teachers and experts involved in apprenticeship examination.
Impacts and Benefits (*impact on the environment, education etc; Benefits and related challenges about its usage*)	The project enhances the digital competencies of VET educators, enabling them to integrate modern technologies into their teaching practices. This helps in preparing students more effectively for a digitalized job market. By incorporating digital tools and methodologies into VET, the initiative ensures that educational practices are up-to-date with technological advancements, making the training more relevant and engaging. One of the major challenges is the resistance to change among educators who may be accustomed to traditional teaching methods. Ensuring that all trainers are on board and adept at using new technologies requires comprehensive training and support.
Sustainability, social, financial, innovative, technological benefits	By improving digital literacy, the project aims to bridge the digital divide, providing broader access to educational opportunities. The initiative helps in developing sustainable training practices that can continuously adapt to technological advancements. The project facilitates widespread adoption of the latest educational technologies within the VET system, keeping it aligned with industry standards.
Target group/End-users	VET Educators and Trainers, VET School Teachers, Experts Involved in Apprenticeship Examination

Other comments/images	

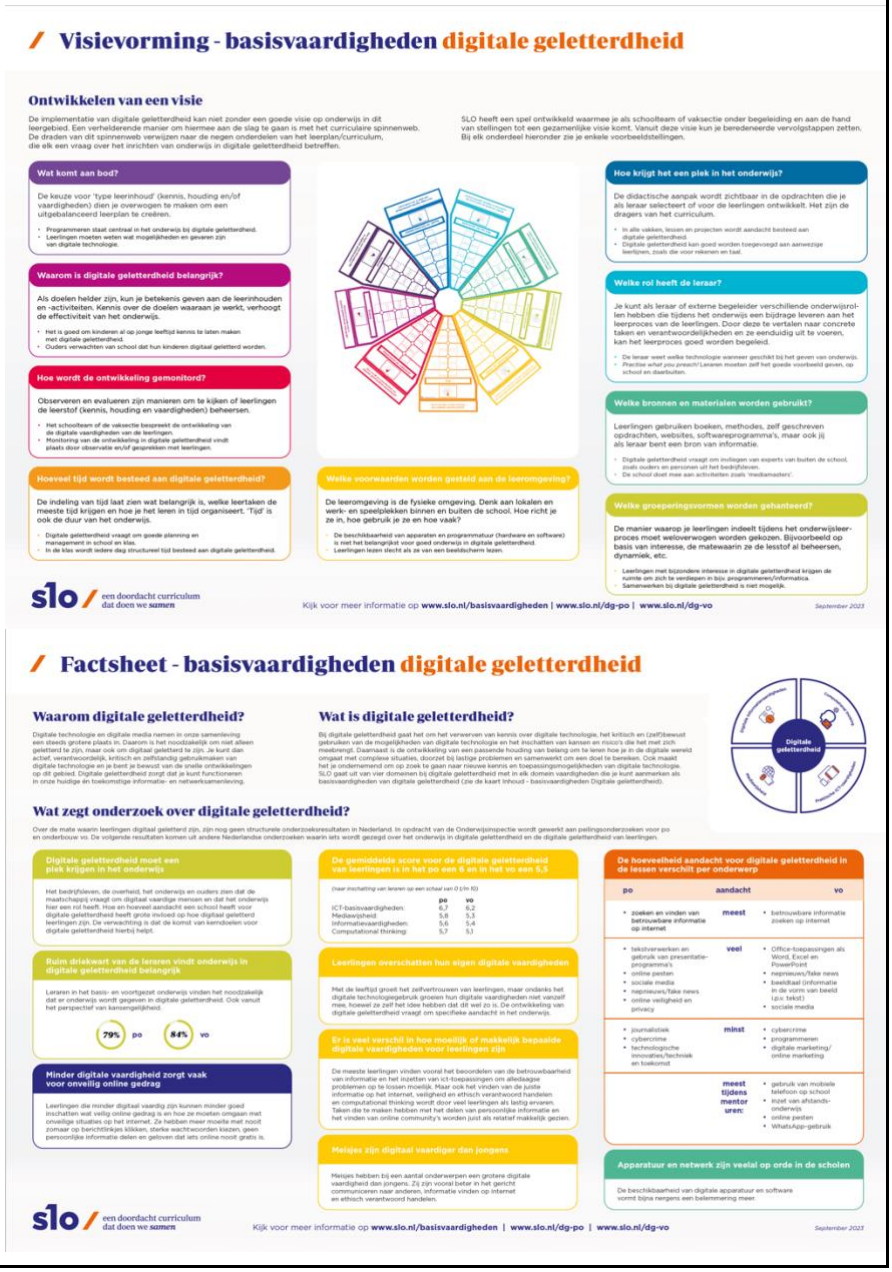
Name of best practice	GROOVE - DiGital tRansfOrmatiOn of the Vet sEctor
Links	https://grooveproject.eu/
The name of the organization that developed it and its promoter and/or owner, whether it exists.	CARDET, DIE BERATER, EUROTRAINING, FIP, INOVA+, STPEUROPA, INNOVADE
Location (*Country, City*)	Germany
Description of good practice	GROOVE project aims to build the capacity of VET providers/trainers to digitize, modernize their practices and build the low-skilled adults' digital literacy skills and fill the gap between the demand for, and supply of, a digitally competent workforce through adjusting the VET sector to become more resilient to rapid technological and labour market changes.
Impacts and Benefits ***(impact on the environment, education etc; Benefits and related challenges about its usage)***	By building the capacity of VET providers and trainers to digitize and modernize their practices, the project significantly contributes to improving digital literacy. This is crucial for keeping up with the rapid technological advancements impacting the job market. The project supports VET providers in implementing digital education action plans, which modernize educational practices. This includes the adoption of pedagogically-driven digital technologies and support for remote teaching, which are essential in today's increasingly digital learning environments. One of the project's goals is to raise awareness about the importance of digital literacy, particularly among low-skilled adults in Europe. This is a key step in ensuring that all segments of the population can benefit from digital advancements. While the project aims to enhance digital skills, there is a challenge in ensuring that these improvements reach all individuals, especially those in lower socio-economic groups or in less developed regions where digital gaps are more pronounced. There can be resistance to adopting new technologies and methods from both trainers and learners accustomed to traditional teaching methods. Overcoming this resistance requires effective change management strategies and ongoing support and training for users.
Sustainability, social, financial, innovative, technological benefits	The project aims to develop sustainable digital literacy skills that remain relevant as technological advancements continue. By building these enduring skills, GROOVE contributes to the long-

	term sustainability of the workforce. The use of digital tools and e-learning reduces the need for physical materials, leading to more sustainable educational practices with lower environmental impact. By integrating advanced digital tools and platforms, GROOVE helps the VET sector keep pace with current technological trends. The project focuses on upskilling trainers and learners in cutting-edge digital technologies, which are crucial for modern workplaces.
Target group/End-users	VET Providers, VET Trainers, VET Learners, Low-Skilled Adults
Other comments/images	

Name of best practice	VETCAMP - Green VET Online Campus
Links	https://vetcamp-project.eu/
The name of the organization that developed it and its promoter and/or owner, whether it exists.	Volkshochschule Schrobenhausen e.V., EVBB, BEST, CANDIDE International, EAEC, ReadLab, DOM Spain, AEVA
Location (*Country, City*)	Germany
Description of good practice	Known as the 'Green VET Online Campus,' this project catalyzes the digital transformation within VET institutions. It involves creating an online campus supported by an open educational resources framework, which facilitates the sharing of digital and green skills, enhancing the digital capabilities of VET trainers and learners.
Impacts and Benefits ***(impact on the environment, education etc; Benefits and related challenges about its usage)***	VETCAMP emphasizes the education of green skills, which directly contributes to sustainable practices and environmental awareness in the VET sector. By creating a state-of-the-art online campus, VETCAMP provides accessible, high-quality educational opportunities, particularly in green VET programs. The project advances digital literacy among VET educators and learners, preparing them for the demands of modern, digitally-driven workplaces. VETCAMP's use of an open educational resources (OER) framework facilitates the sharing and development of digital and green learning content. Integrating new digital tools and platforms may present challenges, particularly for educators and institutions less familiar with advanced technology. Ensuring the consistency and quality of educational content across digital platforms is crucial and requires ongoing management and support.
Sustainability, social, financial, innovative, technological benefits	The use of digital platforms reduces the physical resources needed for training, contributing to environmental sustainability. By providing online resources and courses, VETCAMP makes learning accessible to a broader audience, including those in remote or underserved regions. VETCAMP's online campus leverages modern technology to deliver education, enhancing digital literacy and technical skills among users. The project facilitates the integration of cutting-edge technologies in education, including the use of open educational resources (OER) and online learning management systems.

Target group/End-users	VET Educators and Trainers, VET Learners, VET Institutions, Policy Makers
Other comments/images	

Name of best practice	Integration of Digital Literacy at SLO
Links	https://www.slo.nl/sectoren/vmbo/digitale-geletterdheid-vmbo/digitale-geletterdheid-vo/digitale-geletterdheid-onderwijspraktijk/
The name of the organization that developed it and its promoter and/or owner, whether it exists.	SLO (Stichting Leerplanontwikkeling)
Location (*Country, City*)	The Netherlands
Description of good practice	The integration of digital literacy within educational practices at SLO involves a comprehensive approach using five key cards: 1. **Stappenplan (Step-by-step Plan)**: Guides the development, implementation, and monitoring of digital literacy education. 2. **Visievorming (Vision Development)**: Collaborative approach to create a unified vision for digital literacy. 3. **Adviezen (Advice)**: Practical recommendations for integrating digital literacy into teaching. 4. **Inhoudskaart (Content Map)**: Detailed content map outlining essential knowledge, skills, and attitudes. 5. **Factsheet**: Summary of the importance, current state, and gaps in students' digital skills.
Impacts and Benefits ***(impact on the environment, education etc; Benefits and related challenges about its usage)***	**Education**: Enhances comprehensive digital literacy education. **Challenges**: Ensuring consistent implementation and adaptation to diverse educational contexts.
Sustainability, social, financial, innovative, technological benefits	**Social**: Improves teaching practices and student skills. **Financial**: Cost-effective resources. **Innovative**: Integrates various digital literacy aspects. **Technological**: Provides tools for visualizing research processes and lesson planning.
Target group/End-users	**School teams** **Educators** **Students**

	Policymakers
Other comments/images	

Inhoudskaart - basisvaardigheden digitale geletterdheid

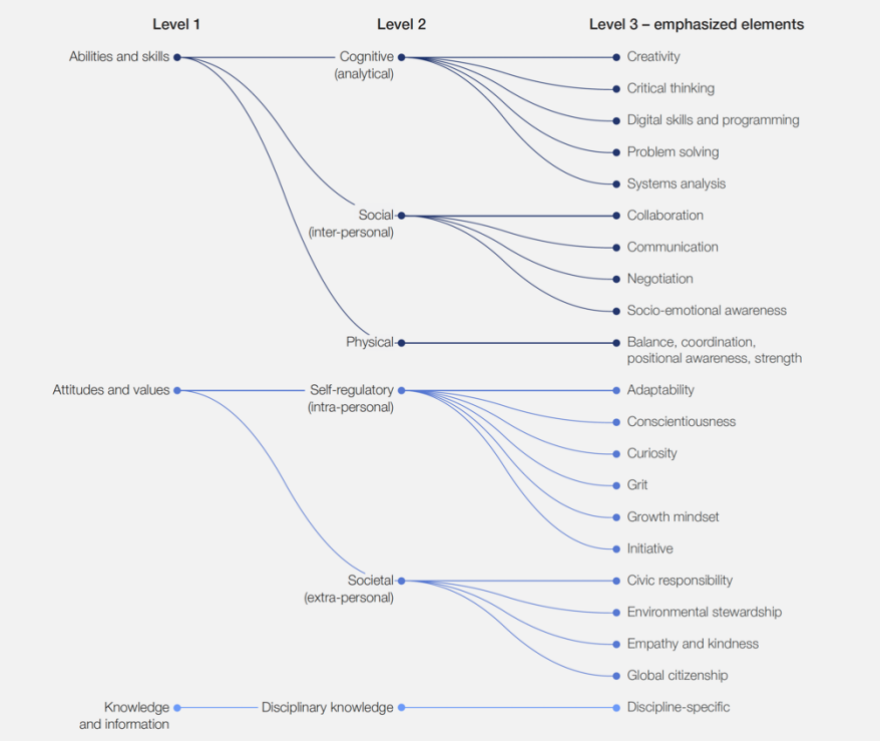
Adviezen - basisvaardigheden digitale geletterdheid

Stappenplan - basisvaardigheden digitale geletterdheid

Name of best practice	NOLAI Reference Framework 2022
Links	https://www.nolai.nl/ and https://www.ru.nl/en/nolai/knowledge-about-ai-in-education
The name of the organization that developed it and its promoter and/or owner, whether it exists.	Radboud University, NOLAI
Location (*Country, City*)	The Netherlands
Description of good practice	Framework guiding AI integration in education, involving collaboration among school administrators, leaders, teachers, trainers, academics, and businesses. **Focus Areas of NOLAI** NOLAI operates through five focus areas: 1. **Teacher Professionalisation**: Led by Pierre Gorissen and Roald Verhoef, this area supports current and future teachers in using AI educationally. 2. **Technology for AI in Education**: Led by Johan Jeuring and Serge Thill, focusing on developing necessary technologies for AI integration in education. 3. **Sustainable Data**: Led by Bernard van Gastel, Erik Poll, and Joep Bos-Coenraad, focusing on data privacy, security, and sustainability. 4. **Ethics**: Led by Marthe Stevens and Tamar Sharon, addressing ethical issues and responsible AI use in education. 5. **Pedagogy & Didactics**: Led by Carla Haelermans and Eliane Segers, focusing on the pedagogical and didactic implications of AI in education.
Impacts and Benefits (*impact on the environment, education etc; Benefits and related challenges about its usage*)	Enhances collaboration, improves AI use in education, addresses educational needs and technological implementation challenges.
Sustainability, social, financial, innovative,	Social: Promotes a unified approach; Financial: Supported by National Growth Funds; Innovative: Combines human and AI

technological benefits	intelligence; Technological: Detailed AI adaptivity levels.
Target group/End-users	School administrators, school leaders, teachers, teacher trainers, academics, business community
Other comments/images	

Name of best practice	Defining Education 4.0: A Taxonomy for the Future of Learning
Links	https://www.weforum.org/reports/building-a-common-language-for-skills-at-work-a-global-taxonomy/
The name of the organization that developed it and its promoter and/or owner, whether it exists.	World Economic Forum
Location (*Country, City*)	Switzerland, Geneva
Description of good practice	A comprehensive taxonomy for future learning, detailing abilities, skills, attitudes, and values needed in education. It aims to bridge the gap between early childhood and adult learning by providing a structured framework for developing essential skills.
Impacts and Benefits (*impact on the environment, education*	Promotes holistic skill development from a young age, aligning educational outcomes with future job market needs. Challenges include the need for widespread adoption and integration into

etc; Benefits and related challenges about its usage)	existing curricula.
Sustainability, social, financial, innovative, technological benefits	Encourages lifelong learning, fosters global citizenship, and supports the integration of digital skills. Emphasizes socio-emotional learning and ethical considerations in technology use.
Target group/End-users	Educators, policymakers, students, and employers
Other comments/images	Focuses on a multistakeholder approach to redefine education for the future. 

DIGITRANER 4.0
Upskilling trainers to education 4.0

WP2.2: Informes nacionales, informe de síntesis europeo y traducción
A2: Investigación, diseño y contenido

Informe de síntesis

CRES, Italia

Junio 2024

Co-funded by the European Union

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1. Introducción

En el segundo paquete de trabajo del proyecto DIGITRAINER 4.0 - Upskilling Trainers to Education 4.0, todos los socios del proyecto realizaron cuestionarios y entrevistas utilizando un enfoque de investigación cualitativa y cuantitativa para obtener información sobre el estado actual del uso de las herramientas digitales y las necesidades de los educadores en el ámbito de la enseñanza y la educación en Italia 4.0.

En total, **191 profesores, formadores y educadores** de diferentes niveles educativos y especializaciones y **10 mentores experimentados** en métodos de enseñanza innovadores participaron en los países asociados: NL, IT, ES, MT, GE.

El objetivo de las entrevistas fue identificar las necesidades formativas y los retos a los que se enfrentan los centros educativos en el uso de las tecnologías y herramientas digitales en el contexto educativo actual.

Los cuestionarios y entrevistas se realizaron en línea -entre abril y junio de 2024- con docentes de diferentes áreas de enseñanza y antecedentes educativos para garantizar una participación diversa.

A continuación se resumen los resultados de los cuestionarios y entrevistas realizados en todos los países socios.

2. Análisis de los resultados de las encuestas realizadas

2.2 Encuestas a docentes

1. Perfil de los entrevistados

La primera parte de la encuesta a los docentes se estructuró para perfilar a los participantes y comprender sus antecedentes, grupo de edad, sexo, función en la escuela o institución de formación, años de experiencia profesional y la materia en la que el profesor enseña o se especializa.

El resumen de los resultados obtenidos de los participantes es el siguiente:

País	Países Bajos Italia España Malta Alemania	35 50 36 35 35
Rango de edad (años)	+60 50-59 40-49 30-39 25-29 -25	19 45 57 44 18 7
Género	F	114

	M	77
Años de experiencia profesional	+ 15 10 – 15 7 – 10 4 – 6 1 – 3 - 1	76 16 42 26 22 8
Trayectoria profesional	Ámbito lingüístico Campo histórico-filosófico Ámbito científico Ámbito pedagógico-social Campo artístico-expresivo Ámbito económico-administrativo Ámbito tecnológico Otro	55 28 19 18 16 20 18 17

2. Experiencias en el uso de herramientas digitales

La segunda parte del cuestionario se centró en el uso de herramientas digitales, especificando el tipo de herramientas utilizadas, la frecuencia con la que se utilizaban y cómo aprendieron a utilizarlas.

El resumen de los resultados obtenidos de los participantes es el siguiente:

Frecuencia de uso	Nunca Rara vez / 1-2 veces al mes A veces / 1 vez por semana A menudo / 2-3 veces por semana Muy a menudo / uso diario	19 45 57 44 18
Tipos de herramientas *(opción múltiple)*	Analítica de aprendizaje Entrega de contenido Evaluación y retroalimentación Colaboración y comunicación	36 136 82 76
Razones de uso	- Diversificar la enseñanza - Mejor distribución de la información - Aumentar la capacidad de atención y el compromiso de los estudiantes - Proporcionar acceso a recursos más amplios y variados - Fomentar la interacción con los estudiantes - Facilitar el trabajo / productividad - Mejorar la planificación de las clases / gestionar las clases de forma eficaz - Ahorrar tiempo / acelerar la preparación - Posibilidad de crear nuevos recursos / preparar actividades - Acercarse al lenguaje digital de los alumnos - Ayudar a personalizar la oferta educativa	

	- Habilitar la enseñanza en línea - Hacer que el aprendizaje sea más efectivo - Promover estrategias para garantizar la equidad e inclusión de todos los estudiantes	
Métodos de entrenamiento *(opción múltiple)*	Grado (universidad) Curso de formación postgrado Autoaprendizaje Aprendizaje entre iguales Otros (posgrado)	56 30 137 62 2

3. Nivel de competencias digitales

La tercera y última sección del cuestionario se centra en el nivel de alfabetización digital (actual y deseado) y en las percepciones de los docentes sobre diversos temas de alfabetización digital en las escuelas.

Dispositivos digitales *(equipado – usado)*	Pizarras Multimedia Interactivas Tabletas Registro Electrónico Computadoras – notebooks Pizarras gráficas – pen tablets – pen-displays	105 71 102 121 66	76 59 99 112 48
Calificación de habilidad *(autoevaluación)*	Excelente Muy bien Bien Justo Pobre	20 83 58 27 3	
Disposición a mejorar el conocimiento sobre las herramientas de educación digital	En toda su extensión En muy alto grado Hasta cierto punto No	73 72 43 3	
Percepción de las necesidades de digitalización *(tasa de 1-bajo a 5-alto)*	- Herramientas y recursos digitales para mejorar la enseñanza y el aprendizaje - Capacitación y educación sobre la integración efectiva de la tecnología en el aula - Acceso a dispositivos tecnológicos adecuados para los estudiantes - Soporte técnico y mantenimiento de infraestructura digital en la escuela - Estrategias para garantizar la equidad y la inclusión digital entre los estudiantes - Desarrollo de políticas y directrices claras para el uso de la tecnología en la educación - Integración de la tecnología para facilitar la	4.46 4.42 4.19 4.37 4.21 4.30 4.26	

	evaluación y la retroalimentación del aprendizaje	

De las respuestas recibidas se desprende que existe una voluntad de mejorar el uso y la integración de los recursos digitales en el contexto educativo, con la necesidad de apoyar el proceso en términos de formación, accesibilidad e inclusión. Estos hallazgos apuntan a la necesidad de un desarrollo profesional continuo, programas de capacitación específicos y un enfoque en la alfabetización digital para mejorar la experiencia educativa general.

3. Conclusiones de las entrevistas realizadas a los dos mentores experimentados en educación 4.0

Los **10 mentores** entrevistados, de los diferentes cinco países, para el proyecto DIGITRAINER 4.0 cuentan con una amplia experiencia en el sector educativo, especialmente en la integración de las tecnologías digitales en los procesos de aprendizaje.

Las respuestas muestran que todos los mentores hacen un uso extensivo de herramientas y tecnologías digitales, en particular dispositivos tecnológicos como computadoras, tabletas, libros digitales, multimedia y herramientas digitales innovadoras para:

- **Creación de recursos educativos**, gracias a herramientas como BookCreator, Canva, LearningApps, StopMotion Studio,... y las plataformas y sistemas de IA generativa, que son la última evolución de la experiencia de aprendizaje autoguiado;
- **Configurando y gestionando aulas** (Microsoft Teams, Google Meet, Zoom...), estas herramientas son especialmente útiles para mantener la interacción y el compromiso de los alumnos, incluso cuando aprenden a distancia. También se pueden utilizar para organizar tutorías individuales y reuniones grupales, facilitando la comunicación y la colaboración fuera del aula física;
- **Involucrar a los estudiantes en el proceso de aprendizaje**, como Kahoot!, Quizlet para una participación dinámica y gamificada, o Google Docs, Microsoft OneNote para permitir que los estudiantes colaboren en proyectos en tiempo real, compartan ideas y editen documentos compartidos simultáneamente. Esto fomenta la colaboración entre los estudiantes y mejora su capacidad para trabajar en equipo, incluso a distancia;

- **Recopilar evaluaciones y comentarios**, utilizando herramientas como Turnitin para detectar plagio y Rúbrica para evaluar el trabajo de los estudiantes para establecer criterios de evaluación claros;
- **Facilitar la comunicación** con los padres y la colaboración entre profesores y terapeutas a través de plataformas educativas online, como Seesaw o ClassDojo. Estas herramientas digitales no solo ayudan a personalizar el aprendizaje para satisfacer las necesidades individuales de los estudiantes, sino que también fomentan su independencia y participación en el aula.

Entre los elementos que los encuestados refieren a la importancia del uso de herramientas digitales en el espacio educativo, se encuentran: el aumento de la productividad, captar la atención de los estudiantes y promover la eficiencia del proceso formativo, facilitar el aprendizaje de los estudiantes y la preparación de actividades por parte del formador, la rapidez para preparar, evaluar y medir los contenidos y la necesidad de que tanto los formadores como los estudiantes se adapten a estas herramientas que cada vez cobran más importancia en el ámbito de la educación. diferentes esferas de la vida.

Los encuestados identificaron varias necesidades clave para una digitalización eficaz en sus entornos escolares, que se resumen a continuación:

- Apoyo tecnológico e infraestructura robusta, incluida la tecnología moderna dentro de las instituciones educativas, disponible tanto para docentes como para estudiantes;
- Formación y apoyo continuos tanto a docentes como a estudiantes, esenciales para el uso eficaz y consciente de las herramientas digitales;
- Mayor accesibilidad a la información y a los recursos, con la consiguiente posibilidad de adaptarlos a las necesidades del aula, permitiendo una enseñanza más inclusiva, especialmente en el caso de alumnos con dificultades de aprendizaje, para los que se pueden proporcionar materiales adaptados.
- Colaboración en la puesta en común e intercambio de conocimientos entre profesores y alumnos, promoviendo un aprendizaje más dinámico y participativo;
- Desarrollar políticas y directrices claras para el uso de la tecnología en la educación, promoviendo la participación y el compromiso en el entorno escolar digital;

4. Conclusiones y recomendaciones

Los resultados de la encuesta y las entrevistas realizadas en el marco del proyecto DIGITRAINER 4.0 ofrecen una imagen bastante completa del estado actual del uso de las herramientas digitales y de las necesidades del sector educativo. Tanto los resultados de la encuesta como la información recabada por los mentores muestran que en la

actualidad existe un gran compromiso por parte del profesorado con el uso de las nuevas tecnologías y herramientas en la didáctica (preparación, comunicación y puesta en común de recursos), así como una voluntad de formarse o actualizarse.

Está claro que el uso de plataformas de entrega de contenidos, analítica de aprendizaje y herramientas de inteligencia artificial está creciendo con fuerza en el sector educativo, pero muchos educadores aún carecen de formación y/o apoyo adecuados dentro de las instituciones (especialmente las públicas). En particular, los docentes han manifestado interés y necesidad en la implementación de estrategias de integración: metodologías, desarrollo profesional continuo, apoyo tecnológico y acceso a recursos digitales, habilidades y conocimientos. A pesar de la disparidad en la disponibilidad y el uso de los recursos digitales entre las diferentes escuelas de todo el país, tanto los cuestionarios como las entrevistas a los mentores ponen de relieve la necesidad de un enfoque más unificado y continuo de la educación digital innovadora.

A continuación se resumen las recomendaciones recogidas por la asociación:

Mejorar los programas de capacitación y desarrollo profesional

- Invertir en programas de desarrollo profesional continuos centrados en la integración efectiva de la tecnología.
- Facilitar sesiones de formación y talleres frecuentes sobre nuevas herramientas y tecnologías digitales, especialmente aquellas que sean relevantes para la diversa gama de materias que se imparten.
- Proporcionar formación especializada sobre el uso de la IA en la educación para ayudar a los profesores a aprovechar estas tecnologías para la planificación de lecciones, la evaluación de los alumnos y el aprendizaje personalizado.

Mejorar la infraestructura técnica y de supervisión

- Invertir en la mejora de la infraestructura tecnológica, incluyendo la tecnología moderna dentro de las instituciones educativas disponible tanto para profesores como para estudiantes.
- Proporcionar soporte técnico y mantenimiento continuos para garantizar que las herramientas digitales y la infraestructura estén siempre en óptimas condiciones, minimizando el tiempo de inactividad y asegurando una integración perfecta de las herramientas digitales en el aula.
- Evaluar y actualizar continuamente las herramientas y tecnologías digitales utilizadas en las escuelas para mantenerse al día con los avances tecnológicos y las tendencias de la industria.
- Realizar evaluaciones periódicas para supervisar la eficacia de la integración de herramientas digitales y los programas de desarrollo profesional, y utilizar estos datos para tomar decisiones informadas y ajustar las estrategias según sea necesario.

Promover la equidad, la inclusión digital y el entorno de aprendizaje colaborativo

- Invertir en la provisión equitativa de tecnología moderna en todo el territorio e implementar estrategias inclusivas para garantizar un acceso justo e igualitario para todos los alumnos y la igualdad de oportunidades para beneficiarse del aprendizaje digital.
- Desarrollar y difundir políticas y directrices claras que promuevan la equidad digital y garanticen el cumplimiento de las normas de protección de datos, como el RGPD, las consideraciones éticas y las mejores prácticas.
- Fomentar un entorno de apoyo en el que los profesores puedan experimentar y adoptar nuevas tecnologías sin miedo al fracaso, fomentando la innovación y la mejora continua.
- Utilice plataformas y foros en línea para compartir conocimientos y apoyar a los docentes.
- Adaptar el uso de las herramientas digitales a las necesidades específicas de los diferentes grupos de estudiantes, asegurando que las herramientas se seleccionen en función de las necesidades identificadas, como el compromiso, la colaboración o el acceso a la información.

Enfoque en la alfabetización y las habilidades digitales

- Implementar programas centrados en el estudiante que se centren en mejorar la alfabetización digital, el pensamiento crítico y la capacidad de los estudiantes para usar las herramientas digitales de manera efectiva, como el uso seguro de Internet, la identificación de información creíble y la comprensión de las implicaciones éticas del uso de la tecnología.
- Integrar las competencias digitales en el plan de estudios para garantizar que los estudiantes desarrollen competencias digitales básicas y estén preparados para las demandas de la fuerza laboral y la sociedad modernas;
- Proporcionar programas de formación específicos que se centren en enseñar a los educadores a utilizar eficazmente las herramientas digitales para inspirar e involucrar a los estudiantes.

Promover enfoques y herramientas digitales innovadores

- Fomentar el uso de plataformas de entrega de contenido, herramientas de análisis de aprendizaje, aplicaciones de colaboración y comunicación, y herramientas de evaluación y retroalimentación para mejorar la experiencia de aprendizaje.
- Promover el uso de tecnologías innovadoras como la IA y la RV para crear experiencias de aprendizaje inmersivas y atractivas.

- Establecer mecanismos de retroalimentación para que educadores y estudiantes compartan sus experiencias y desafíos con herramientas digitales, asegurando que sus necesidades sean atendidas de manera oportuna.
- Fomentar políticas que fomenten la integración de la tecnología para facilitar el aprendizaje, la evaluación y la retroalimentación.

Estas recomendaciones tienen como objetivo promover una visión nueva, más cohesiva e inclusiva de la educación digital innovadora para que educadores y estudiantes se muevan con confianza en un mundo cada vez más digital.

Las fases posteriores del proyecto, que comprenden el diseño y el desarrollo de programas de capacitación específicos, se basarán en las recomendaciones recogidas a través de la encuesta para abordar las necesidades y deficiencias identificadas y promover un entorno educativo más innovador e inclusivo.

DIGITRANER 4.0
Upskilling Trainers to Education 4.0

WP2.2: Nationale Berichte, Europäischer Synthesebericht & Übersetzung
A2: Forschung, Gestaltung und Inhalt

Synthesebericht

CRES, Italien

Juni 2024

Co-funded by the European Union

Inhaltsübersicht

1. Einleitung

Im zweiten Arbeitspaket des Projekts DIGITRAINER 4.0 - Upskilling Trainers to Education 4.0 führten alle Projektpartner Fragebögen und Interviews mit einem qualitativen und quantitativen Forschungsansatz durch, um Informationen über den aktuellen Stand der Nutzung digitaler Werkzeuge und die Bedürfnisse von Pädagogen im Bereich Unterricht und Bildung in Italien 4.0 zu erhalten.

Insgesamt waren in den Partnerländern - NL, IT, ES, MT, GE - **191 Lehrer, Ausbilder und Erzieher** aus verschiedenen Bildungsstufen und Fachrichtungen sowie **10 erfahrene Mentoren** für innovative Lehrmethoden beteiligt.

Ziel der Interviews war es, den Schulungsbedarf und die Herausforderungen zu ermitteln, denen sich Schulen bei der Nutzung digitaler Technologien und Werkzeuge im aktuellen Bildungskontext gegenübersehen.

Die Fragebögen und Interviews wurden online - zwischen April und Juni 2024 - mit Lehrern aus verschiedenen Lehrbereichen und mit unterschiedlichem Bildungshintergrund durchgeführt, um eine vielfältige Beteiligung zu gewährleisten.

Die Ergebnisse der in allen Partnerländern durchgeführten Fragebögen und Interviews sind im Folgenden zusammengefasst.

2. Analyse der Ergebnisse der durchgeführten Umfragen

2.2 Erhebungen bei Lehrern

1. Profil der befragten Personen

Der erste Teil der Lehrerbefragung war so strukturiert, dass ein Profil der Teilnehmer erstellt und ihr Hintergrund, ihre Altersgruppe, ihr Geschlecht, ihre Rolle in der Schule oder Ausbildungseinrichtung, ihre langjährige Berufserfahrung und das Fach, in dem sie unterrichten oder sich spezialisieren, erfasst wurden.

Die von den Teilnehmern erhaltenen Ergebnisse lassen sich wie folgt zusammenfassen:

Land	Die Niederlande Italien Spanien Malta Deutschland	35 50 36 35 35
Altersspanne (Jahre)	+60 50-59 40-49 30-39 25-29	19 45 57 44 18

	-25	7
Geschlecht	F M	114 77
Berufserfahrung Jahre	+ 15 10 - 15 7 - 10 4 - 6 1 - 3 - 1	76 16 42 26 22 8
Beruflicher Hintergrund	Linguistischer Bereich Historisch-philosophischer Bereich Wissenschaftlicher Bereich Pädagogisch-sozialer Bereich Künstlerisch-expressiver Bereich Wirtschaftlich-administrativer Bereich Technologischer Bereich Andere	55 28 19 18 16 20 18 17

2. Erfahrungen mit der Nutzung digitaler Werkzeuge

Der zweite Teil des Fragebogens befasste sich mit der Nutzung digitaler Hilfsmittel, wobei die Art der verwendeten Hilfsmittel, die Häufigkeit ihrer Nutzung und die Art und Weise, wie sie die Nutzung erlernt haben, angegeben wurden.

Die von den Teilnehmern erhaltenen Ergebnisse lassen sich wie folgt zusammenfassen:

Häufigkeit der Nutzung	Niemals Selten / 1-2 Mal pro Monat Manchmal / 1 Mal pro Woche Oft / 2-3 Mal pro Woche Sehr oft / täglicher Gebrauch	19 45 57 44 18
Arten von Tools *(Multiple-Choice-Verfahren)*	Lernende Analytik Lieferung von Inhalten Bewertung und Feedback Zusammenarbeit und Kommunikation	36 136 82 76
Gründe für die Verwendung	- Den Unterricht diversifizieren - Bessere Verbreitung von Informationen - Erhöhung der Aufmerksamkeitsspanne/Engagement der Schüler - Zugang zu umfassenderen und vielfältigeren Ressourcen bieten - Förderung der Interaktion mit Studenten - Arbeitserleichterung/Produktivität - Verbesserung der Unterrichtsplanung / effektives Klassenmanagement	

	- Zeit sparen / Vorbereitung beschleunigen - Möglichkeit der Schaffung neuer Ressourcen / Vorbereitung von Aktivitäten - Näher an die digitale Sprache der Schüler herankommen - Hilfe bei der Personalisierung des Bildungsangebots - Online-Unterricht ermöglichen - Lernen effektiver gestalten - Förderung von Strategien zur Gewährleistung von Gleichheit und Integration aller Schüler	
Ausbildungsmethoden ***(Multiple-Choice-Verfahren)***	Studienlaufbahn (Universität) Fortbildungskurs nach der Ausbildung Selbstlernende Peer-learning Sonstige (nach Abschluss des Studiums)	56 30 137 62 2

3. Niveau der digitalen Fertigkeiten

Der dritte und letzte Abschnitt des Fragebogens befasst sich mit dem Grad der digitalen Kompetenz (aktuell und erwünscht) und den Wahrnehmungen der Lehrkräfte zu verschiedenen Fragen der digitalen Kompetenz in den Schulen.

Digitale Geräte ***(ausgestattet - gebraucht)***	Interaktive Multimedia-Whiteboards Tabletten Elektronisches Register Computer - Notebooks Grafiktafeln - Stifttabletts - Stift-Displays	105 71 102 121 66	76 59 99 112 48
Bewertung der Fertigkeiten ***(Selbsteinschätzung)***	Ausgezeichnet Sehr gut Gut Messe Schlecht	20 83 58 27 3	
Bereitschaft zur Verbesserung der Kenntnisse über digitale Bildungsinstrumente	In vollem Umfang In sehr hohem Maße Bis zu einem gewissen Grad Nein	73 72 43 3	
Wahrnehmung des Digitalisierungsbedarfs ***(Bewertung von 1-niedrig bis 5-hoch)***	- Werkzeuge und digitale Ressourcen zur Verbesserung von Lehren und Lernen - Schulung und Ausbildung zur effektiven Integration von Technologie in den Unterricht - Zugang zu geeigneten technischen Geräten für Studenten - Technische Unterstützung und Wartung der digitalen Infrastruktur in der Schule	4.46 4.42 4.19 4.37	

	- Strategien zur Gewährleistung von Chancengleichheit und digitaler Integration von Schülern - Entwicklung klarer Strategien und Leitlinien für den Einsatz von Technologie im Bildungswesen - Integration von Technologie zur Erleichterung der Bewertung und des Feedbacks beim Lernen	4.21 4.30 4.26

Aus den eingegangenen Antworten geht klar hervor, dass der Wunsch besteht, die Nutzung und Integration digitaler Ressourcen im Bildungskontext zu verbessern, und dass dieser Prozess in Bezug auf Ausbildung, Zugänglichkeit und Integration unterstützt werden muss. Diese Ergebnisse weisen auf die Notwendigkeit einer kontinuierlichen beruflichen Entwicklung, gezielter Schulungsprogramme und eines Schwerpunkts auf der digitalen Kompetenz hin, um die Bildungserfahrung insgesamt zu verbessern.

3. Ergebnisse aus den Interviews mit den beiden erfahrenen Mentoren im Bildungsbereich 4.0

Die **10** für das Projekt DIGITRAINER 4.0 befragten **Mentoren** aus den verschiedenen fünf Ländern verfügen über große Erfahrung im Bildungsbereich, insbesondere bei der Integration digitaler Technologien in Lernprozesse.

Die Antworten zeigen, dass alle Mentorinnen und Mentoren in großem Umfang digitale Werkzeuge und Technologien nutzen, insbesondere technologische Geräte wie Computer, Tablets, digitale Bücher, Multimedia und innovative digitale Werkzeuge für den Unterricht:

- **Erstellung von Bildungsressourcen** dank Tools wie BookCreator, Canva, LearningApps, StopMotion Studio,... und generativen KI-Plattformen und -Systemen, die die jüngste Entwicklung der selbstgesteuerten Lernerfahrung darstellen;
- **Die Einrichtung und Verwaltung von Klassenzimmern** (Microsoft Teams, Google Meet, Zoom...) sind besonders nützlich, um die Interaktion und das Engagement der Schüler aufrechtzuerhalten, auch wenn sie aus der Ferne lernen. Sie können auch für Einzeltutorien und Gruppensitzungen genutzt werden, um die Kommunikation und Zusammenarbeit außerhalb des Klassenzimmers zu erleichtern;
- **Einbindung der Schüler in den Lernprozess**, wie z. B. Kahoot!, Quizlet für dynamisches und spielerisches Lernen oder Google Docs, Microsoft OneNote, damit die Schüler in Echtzeit an Projekten zusammenarbeiten, Ideen austauschen und gemeinsame Dokumente gleichzeitig bearbeiten können. Dies fördert die

Zusammenarbeit zwischen den Studierenden und verbessert ihre Fähigkeit, als Team zu arbeiten, auch über die Entfernung hinweg;

- **Sammeln Sie Bewertungen und Rückmeldungen**, indem Sie Tools wie Turnitin zum Aufspüren von Plagiaten und Rubriken zur Bewertung von Schülerarbeiten verwenden, um klare Bewertungskriterien festzulegen;
- **Erleichterung der Kommunikation** mit den Eltern und der Zusammenarbeit zwischen Lehrern und Therapeuten durch Online-Bildungsplattformen wie Seesaw oder ClassDojo. Diese digitalen Tools helfen nicht nur dabei, das Lernen auf die individuellen Bedürfnisse der Schüler abzustimmen, sondern fördern auch ihre Unabhängigkeit und Beteiligung am Unterricht.

Zu den Elementen, die die Befragten auf die Bedeutung des Einsatzes digitaler Werkzeuge im Bildungsbereich hinweisen, gehören: erhöhte Produktivität, Erfassen der Aufmerksamkeit der Studenten und Förderung der Effizienz des Ausbildungsprozesses, Erleichterung des Lernens der Studenten und der Vorbereitung von Aktivitäten durch den Ausbilder, die Geschwindigkeit bei der Vorbereitung, Bewertung und Messung von Inhalten und die Notwendigkeit für Ausbilder und Studenten, sich an diese Werkzeuge anzupassen, die in verschiedenen Lebensbereichen immer wichtiger werden.

Die Befragten nannten mehrere zentrale Anforderungen für eine wirksame Digitalisierung in ihrem schulischen Umfeld, die im Folgenden zusammengefasst werden:

- Technologische Unterstützung und solide Infrastruktur, einschließlich moderner Technologie in den Bildungseinrichtungen, die sowohl Lehrern als auch Schülern zur Verfügung steht;
- Fortlaufende Schulungen und Unterstützung für Lehrkräfte und Schüler, die für einen wirksamen und bewussten Umgang mit digitalen Werkzeugen unerlässlich sind;
- Besserer Zugang zu Informationen und Ressourcen und damit die Möglichkeit, diese an die Bedürfnisse der Klasse anzupassen, was einen integrativeren Unterricht ermöglicht, insbesondere für Schüler mit Lernschwierigkeiten, denen angepasste Materialien zur Verfügung gestellt werden können.
- Zusammenarbeit bei der Weitergabe und dem Austausch von Wissen zwischen Lehrern und Schülern, Förderung eines dynamischeren und partizipativen Lernens;
- Entwicklung klarer Strategien und Leitlinien für den Einsatz von Technologie in der Bildung, Förderung der Beteiligung und des Engagements in der digitalen Schulumgebung;

4. Schlussfolgerungen und Empfehlungen

Die Ergebnisse der Umfrage und der Interviews, die im Rahmen des Projekts DIGITRAINER 4.0 durchgeführt wurden, vermitteln ein recht umfassendes Bild des aktuellen Stands der Nutzung digitaler Werkzeuge und der Bedürfnisse des Bildungssektors. Sowohl die Ergebnisse der Umfrage als auch die von den Mentoren gesammelten Informationen zeigen, dass es inzwischen ein großes Engagement der Lehrkräfte für den Einsatz neuer Technologien und Werkzeuge in der Didaktik (Vorbereitung, Kommunikation und gemeinsame Nutzung von Ressourcen) sowie die Bereitschaft gibt, sich weiterzubilden oder zu aktualisieren.

Es ist klar, dass die Nutzung von Plattformen zur Bereitstellung von Inhalten, Lernanalysen und Werkzeugen der künstlichen Intelligenz im Bildungssektor stark zunimmt, aber vielen Pädagogen fehlt es immer noch an einer angemessenen Ausbildung und/oder Unterstützung innerhalb der Einrichtungen (insbesondere der öffentlichen). Insbesondere Lehrkräfte haben ihr Interesse und ihren Bedarf an der Umsetzung von Integrationsstrategien bekundet - Methoden, kontinuierliche berufliche Weiterbildung, technologische Unterstützung und Zugang zu digitalen Ressourcen, Fähigkeiten und Wissen. Trotz der unterschiedlichen Verfügbarkeit und Nutzung digitaler Ressourcen in den verschiedenen Schulen des Landes wird sowohl in den Fragebögen als auch in den Interviews mit den Mentoren die Notwendigkeit eines einheitlicheren und kontinuierlicheren Ansatzes für innovative digitale Bildung hervorgehoben.

Die von der Partnerschaft gesammelten Empfehlungen sind im Folgenden zusammengefasst:

Verbesserung der Schulungs- und Weiterbildungsprogramme

- Investieren Sie in kontinuierliche Weiterbildungsprogramme, die sich auf die effektive Integration von Technologie konzentrieren.
- Regelmäßige Schulungen und Workshops zu neuen digitalen Werkzeugen und Technologien, insbesondere zu solchen, die für das breite Spektrum der unterrichteten Fächer relevant sind.
- Bereitstellung spezieller Schulungen zum Einsatz von KI im Bildungswesen, um Lehrern dabei zu helfen, diese Technologien für die Unterrichtsplanung, die Bewertung von Schülern und das personalisierte Lernen zu nutzen.

Verbesserung der technischen und Überwachungsinfrastruktur

- Investitionen in die Verbesserung der technologischen Infrastruktur, einschließlich moderner Technologie in den Bildungseinrichtungen, die sowohl Lehrern als auch Schülern zur Verfügung steht.
- Laufende technische Unterstützung und Wartung, um sicherzustellen, dass die digitalen Werkzeuge und die Infrastruktur stets in optimalem Zustand sind, um

Ausfallzeiten zu minimieren und eine nahtlose Integration der digitalen Werkzeuge in den Unterricht zu gewährleisten.

- Kontinuierliche Bewertung und Aktualisierung der in den Schulen eingesetzten digitalen Werkzeuge und Technologien, um mit den technologischen Fortschritten und Branchentrends Schritt zu halten.
- Führen Sie regelmäßige Bewertungen durch, um die Effektivität der Integration digitaler Tools und der Weiterbildungsprogramme zu überwachen, und nutzen Sie diese Daten, um fundierte Entscheidungen zu treffen und Strategien bei Bedarf anzupassen.

Förderung von Chancengleichheit, digitaler Inklusion und kollaborativer Lernumgebung

- Investitionen in die gleichberechtigte Bereitstellung moderner Technologien im gesamten Gebiet und die Umsetzung integrativer Strategien, um einen fairen und gleichberechtigten Zugang für alle Schüler und gleiche Chancen zu gewährleisten, vom digitalen Lernen zu profitieren.
- Entwicklung und Verbreitung klarer Strategien und Richtlinien, die die digitale Gleichberechtigung fördern und die Einhaltung von Datenschutzbestimmungen wie der DSGVO, ethischen Erwägungen und bewährten Verfahren gewährleisten.
- Förderung eines unterstützenden Umfelds, in dem Lehrkräfte ohne Angst vor Misserfolgen mit neuen Technologien experimentieren und diese übernehmen können, wodurch Innovation und kontinuierliche Verbesserung gefördert werden.
- Nutzen Sie Online-Plattformen und Foren, um Wissen auszutauschen und Lehrkräfte zu unterstützen.
- Passen Sie den Einsatz digitaler Hilfsmittel an die spezifischen Bedürfnisse der verschiedenen Schülergruppen an und stellen Sie sicher, dass die Hilfsmittel auf der Grundlage der ermittelten Bedürfnisse wie Engagement, Zusammenarbeit oder Zugang zu Informationen ausgewählt werden.

Schwerpunkt auf digitalen Kompetenzen und Fertigkeiten

- Umsetzung von schülerzentrierten Programmen, die sich auf die Verbesserung der digitalen Kompetenz, des kritischen Denkens und der Fähigkeit zur effektiven Nutzung digitaler Werkzeuge konzentrieren, wie z. B. die sichere Nutzung des Internets, das Erkennen glaubwürdiger Informationen und das Verständnis der ethischen Implikationen der Technologienutzung.
- Integration digitaler Kompetenzen in den Lehrplan, um sicherzustellen, dass die Schüler grundlegende digitale Kompetenzen entwickeln und auf die Anforderungen der modernen Arbeitswelt und Gesellschaft vorbereitet werden;

- Bereitstellung gezielter Schulungsprogramme, in denen Lehrkräfte lernen, wie sie digitale Werkzeuge effektiv einsetzen können, um Schüler zu inspirieren und zu engagieren.

Förderung innovativer digitaler Ansätze und Tools

- Förderung des Einsatzes von Plattformen zur Bereitstellung von Inhalten, Lernanalysetools, Anwendungen für Zusammenarbeit und Kommunikation sowie Bewertungs- und Feedback-Tools zur Verbesserung der Lernerfahrung.
- Förderung des Einsatzes innovativer Technologien wie künstliche Intelligenz und virtuelle Realität (VR), um eindringliche und fesselnde Lernerfahrungen zu schaffen.
- Einrichtung von Feedback-Mechanismen für Lehrkräfte und Schüler, damit sie ihre Erfahrungen und Probleme mit digitalen Werkzeugen mitteilen können, um sicherzustellen, dass auf ihre Bedürfnisse zeitnah eingegangen wird.
- Förderung von Maßnahmen, die die Integration von Technologien zur Erleichterung der Lernbewertung und des Feedbacks unterstützen.

Diese Empfehlungen zielen darauf ab, eine neue, kohärentere und integrative Sichtweise der innovativen digitalen Bildung zu fördern, damit Lehrkräfte und Schüler sich in einer zunehmend digitalen Welt sicher bewegen können.

Die nachfolgenden Phasen des Projekts, die die Konzeption und Entwicklung gezielter Schulungsprogramme umfassen, werden auf den Empfehlungen aufbauen, die im Rahmen der Umfrage gesammelt wurden, um die ermittelten Bedürfnisse und Lücken zu decken und ein innovativeres und integrativeres Bildungsumfeld zu fördern.

DIGITRANER 4.0
Aggiornamento dei formatori all'educazione 4.0

WP2.2: Rapporti nazionali, rapporto di sintesi europeo e traduzione
A2: Ricerca, design e contenuti

Rapporto di sintesi

CRES, Italia

Giugno 2024

Co-funded by the European Union

Indice dei contenuti

1. Introduzione

Nel secondo pacchetto di lavoro del progetto DIGITRAINER 4.0 - Upskilling Trainers to Education 4.0, tutti i partner del progetto hanno svolto questionari e interviste utilizzando un approccio di ricerca qualitativo e quantitativo per ottenere informazioni sullo stato attuale dell'uso degli strumenti digitali e sulle esigenze degli educatori nel campo dell'insegnamento e dell'educazione in Italia 4.0.

In totale, **191 insegnanti, formatori ed educatori** di diversi livelli educativi e specializzazioni e **10 mentori esperti** in metodi didattici innovativi sono stati coinvolti nei Paesi del partenariato - NL, IT, ES, MT, GE.

L'obiettivo delle interviste era quello di identificare i bisogni formativi e le sfide che le scuole devono affrontare nell'utilizzo delle tecnologie e degli strumenti digitali nell'attuale contesto educativo.

I questionari e le interviste sono stati condotti online - tra aprile e giugno 2024 - con insegnanti di diverse aree di insegnamento e background educativi per garantire una partecipazione diversificata.

I risultati dei questionari e delle interviste condotte in tutti i Paesi partner sono riassunti di seguito.

2. Analisi dei risultati delle indagini condotte

2.2 Sondaggi agli insegnanti

1. Profilo degli intervistati

La prima parte dell'indagine sugli insegnanti è stata strutturata in modo da tracciare un profilo dei partecipanti e capire il loro background, la fascia d'età, il sesso, il ruolo nella scuola o nell'istituto di formazione, gli anni di esperienza professionale e la materia in cui l'insegnante insegna o si specializza.

La sintesi dei risultati ottenuti dai partecipanti è la seguente:

Paese	Paesi Bassi Italia Spagna Malta Germania	35 50 36 35 35
Fascia d'età (anni)	+60 50-59 40-49 30-39 25-29	19 45 57 44 18

	-25	7
Genere	F M	114 77
Anni di esperienza professionale	+ 15 10 - 15 7 - 10 4 - 6 1 - 3 - 1	76 16 42 26 22 8
Background professionale	Campo linguistico Ambito storico-filosofico Settore scientifico Ambito pedagogico-sociale Ambito artistico-espressivo Settore economico-amministrativo Settore tecnologico Altro	55 28 19 18 16 20 18 17

2. Esperienze nell'uso di strumenti digitali

La seconda parte del questionario si è concentrata sull'uso degli strumenti digitali, specificando il tipo di strumenti utilizzati, la frequenza di utilizzo e le modalità di apprendimento.

La sintesi dei risultati ottenuti dai partecipanti è la seguente:

Frequenza di utilizzo	Mai Raramente / 1-2 volte al mese A volte / 1 volta alla settimana Spesso / 2-3 volte a settimana Molto spesso / uso quotidiano	19 45 57 44 18
Tipi di strumenti *(scelta multipla)*	Analisi dell'apprendimento Consegna dei contenuti Valutazione e feedback Collaborazione e comunicazione	36 136 82 76
Motivi di utilizzo	- Diversificare l'insegnamento - Migliore distribuzione delle informazioni - Aumentare la capacità di attenzione/impegno degli studenti - Fornire l'accesso a risorse più ampie e varie - Incoraggiare l'interazione con gli studenti - Facilitare il lavoro e la produttività - Migliorare la pianificazione delle lezioni / gestire le classi in modo efficace - Risparmiare tempo / velocizzare la preparazione - Possibilità di creare nuove risorse / preparare attività	

	- Avvicinarsi al linguaggio digitale degli studenti - Aiutare a personalizzare l'offerta formativa - Attivare l'insegnamento online - Rendere l'apprendimento più efficace - Promuovere strategie per garantire a tutti gli studenti / equità e inclusione.	
Metodi di formazione ***(scelta multipla)***	Carriera di studio (università) Corso di formazione post diploma Autoapprendimento Apprendimento tra pari Altro (post laurea)	56 30 137 62 2

3. Livello di competenze digitali

La terza e ultima sezione del questionario si concentra sul livello di alfabetizzazione digitale (attuale e desiderato) e sulla percezione degli insegnanti di vari aspetti dell'alfabetizzazione digitale nelle scuole.

Dispositivi digitali ***(equipaggiato - usato)***	Lavagne interattive multimediali Compresse Registro elettronico Computer - notebook Lavagne grafiche - tavolette con penna - display con penna	105 71 102 121 66	76 59 99 112 48
Valutazione dell'abilità ***(autovalutazione)***	Eccellente Molto buono Buono Fiera Povero	20 83 58 27 3	
Disponibilità a migliorare le conoscenze sugli strumenti di educazione digitale	Nella misura in cui In misura molto elevata In una certa misura No	73 72 43 3	
Percezione delle esigenze di digitalizzazione ***(tasso da 1-basso a 5-alto)***	- Strumenti e risorse digitali per migliorare l'insegnamento e l'apprendimento - Formazione e istruzione su un'efficace integrazione della tecnologia in classe - Accesso a dispositivi tecnologici adeguati per gli studenti - Supporto tecnico e manutenzione dell'infrastruttura digitale della scuola - Strategie per garantire l'equità e l'inclusione digitale tra gli studenti	4.46 4.42 4.19 4.37 4.21	

	- Sviluppo di politiche e linee guida chiare per l'uso della tecnologia nell'istruzione. - Integrazione della tecnologia per facilitare la valutazione e il feedback dell'apprendimento.	4.30 4.26

Dalle risposte ricevute emerge chiaramente il desiderio di migliorare l'uso e l'integrazione delle risorse digitali nel contesto educativo, con la necessità di sostenere il processo in termini di formazione, accessibilità e inclusione. Questi risultati evidenziano la necessità di uno sviluppo professionale continuo, di programmi di formazione mirati e di un'attenzione all'alfabetizzazione digitale per migliorare l'esperienza educativa complessiva.

3. Risultati delle interviste condotte ai due mentori esperti in educazione 4.0

I **10 mentori** intervistati, provenienti dai cinque Paesi, per il progetto DIGITRAINER 4.0 hanno una grande esperienza nel settore dell'istruzione, in particolare nell'integrazione delle tecnologie digitali nei processi di apprendimento.

Le risposte mostrano che tutti i tutor fanno ampio uso di strumenti e tecnologie digitali, in particolare di dispositivi tecnologici come computer, tablet, libri digitali, multimedia e strumenti digitali innovativi:

- **Creare risorse didattiche**, grazie a strumenti come BookCreator, Canva, LearningApps, StopMotion Studio,... e a piattaforme e sistemi di intelligenza artificiale generativa, che sono l'ultima evoluzione dell'esperienza di apprendimento autoguidato;
- **La creazione e la gestione di aule** (Microsoft Teams, Google Meet, Zoom...), questi strumenti sono particolarmente utili per mantenere l'interazione e il coinvolgimento degli studenti, anche quando stanno imparando a distanza. Possono anche essere utilizzati per ospitare esercitazioni individuali e riunioni di gruppo, facilitando la comunicazione e la collaborazione al di fuori dell'aula fisica;
- **Coinvolgere gli studenti nel processo di apprendimento**, come ad esempio Kahoot!, Quizlet per un coinvolgimento dinamico e basato sui giochi, o Google Docs, Microsoft OneNote per consentire agli studenti di collaborare a progetti in tempo reale, condividere idee e modificare documenti condivisi simultaneamente. Questo incoraggia la collaborazione tra gli studenti e migliora la loro capacità di lavorare in gruppo, anche a distanza;

- **Raccogliere valutazioni e feedback**, utilizzando strumenti come Turnitin per rilevare il plagio e Rubric per valutare il lavoro degli studenti per stabilire criteri di valutazione chiari;
- **Facilitare la comunicazione** con i genitori e la collaborazione tra insegnanti e terapisti attraverso piattaforme educative online, come Seesaw o ClassDojo. Questi strumenti digitali non solo aiutano a personalizzare l'apprendimento per soddisfare le esigenze individuali degli studenti, ma incoraggiano anche la loro indipendenza e partecipazione in classe.

Tra gli elementi che gli intervistati riferiscono all'importanza dell'uso degli strumenti digitali nello spazio educativo, ci sono: l'aumento della produttività, la cattura dell'attenzione degli studenti e la promozione dell'efficienza del processo di formazione, la facilitazione dell'apprendimento degli studenti e della preparazione delle attività da parte del formatore, la velocità di preparazione, valutazione e misurazione dei contenuti e la necessità sia per i formatori che per gli studenti di adattarsi a questi strumenti che stanno diventando sempre più importanti in diverse sfere della vita.

Gli intervistati hanno identificato diverse esigenze chiave per una digitalizzazione efficace nei loro ambienti scolastici, che sono riassunte di seguito:

- Supporto tecnologico e solide infrastrutture, comprese le moderne tecnologie all'interno degli istituti scolastici, a disposizione sia degli insegnanti che degli studenti;
- Formazione e supporto continui per insegnanti e studenti, essenziali per un uso efficace e consapevole degli strumenti digitali;
- Maggiore accessibilità alle informazioni e alle risorse, con la conseguente possibilità di adattarle alle esigenze della classe, consentendo una didattica più inclusiva, soprattutto nel caso di studenti con difficoltà di apprendimento, per i quali possono essere forniti materiali adattati.
- Collaborazione nella condivisione e nello scambio di conoscenze tra insegnanti e studenti, promuovendo un apprendimento più dinamico e partecipativo;
- Sviluppare politiche e linee guida chiare per l'uso della tecnologia nell'istruzione, promuovendo la partecipazione e l'impegno nell'ambiente scolastico digitale;

4. Conclusioni e raccomandazioni

I risultati dell'indagine e delle interviste condotte nell'ambito del progetto DIGITRAINER 4.0 forniscono un quadro abbastanza completo dello stato attuale dell'utilizzo degli strumenti digitali e delle esigenze del settore educativo. Sia i risultati dell'indagine che le informazioni raccolte dai tutor mostrano che c'è oggi un grande impegno da parte degli insegnanti nell'uso delle nuove tecnologie e degli strumenti nella didattica (preparazione,

comunicazione e condivisione delle risorse), così come la volontà di formarsi o aggiornarsi.

È chiaro che l'uso di piattaforme di distribuzione dei contenuti, di strumenti di analisi dell'apprendimento e di intelligenza artificiale è in forte crescita nel settore dell'istruzione, ma molti educatori non hanno ancora una formazione e/o un supporto adeguati all'interno delle istituzioni (soprattutto quelle pubbliche). In particolare, gli insegnanti hanno espresso interesse e necessità nell'implementazione di strategie di integrazione - metodologie, sviluppo professionale continuo, supporto tecnologico e accesso alle risorse digitali competenze e conoscenze. Nonostante la disparità nella disponibilità e nell'uso delle risorse digitali tra le diverse scuole del Paese, la necessità di un approccio più unitario e continuo all'educazione digitale innovativa è evidenziata sia dai questionari che dai colloqui con i tutor.

Le raccomandazioni raccolte dal partenariato sono riassunte di seguito:

Migliorare i programmi di formazione e sviluppo professionale

- Investire in programmi di sviluppo professionale continuo incentrati sull'integrazione efficace delle tecnologie.
- Facilitare frequenti sessioni di formazione e workshop su nuovi strumenti e tecnologie digitali, in particolare quelli rilevanti per la vasta gamma di materie insegnate.
- Fornire una formazione specializzata sull'uso dell'IA nell'istruzione per aiutare gli insegnanti a sfruttare queste tecnologie per la pianificazione delle lezioni, la valutazione degli studenti e l'apprendimento personalizzato.

Migliorare l'infrastruttura tecnica e di monitoraggio

- Investire nel miglioramento dell'infrastruttura tecnologica, comprese le moderne tecnologie all'interno degli istituti scolastici a disposizione di insegnanti e studenti.
- Fornire assistenza tecnica e manutenzione continua per garantire che gli strumenti e le infrastrutture digitali siano sempre in condizioni ottimali, riducendo al minimo i tempi di inattività e assicurando una perfetta integrazione degli strumenti digitali in classe.
- Valutare e aggiornare continuamente gli strumenti e le tecnologie digitali utilizzati nelle scuole per stare al passo con i progressi tecnologici e le tendenze del settore.
- Condurre valutazioni regolari per monitorare l'efficacia dell'integrazione degli strumenti digitali e dei programmi di sviluppo professionale e utilizzare questi dati per prendere decisioni informate e adeguare le strategie in base alle necessità.

Promuovere l'uguaglianza, l'inclusione digitale e un ambiente di apprendimento collaborativo.

- Investire nella fornitura equa di tecnologie moderne in tutto il territorio e attuare strategie inclusive per garantire un accesso equo e paritario a tutti gli alunni e pari opportunità di beneficiare dell'apprendimento digitale.
- Sviluppare e diffondere politiche e linee guida chiare che promuovano l'equità digitale e garantiscano la conformità con le normative sulla protezione dei dati come il GDPR, le considerazioni etiche e le migliori pratiche.
- Favorire un ambiente favorevole in cui gli insegnanti possano sperimentare e adottare nuove tecnologie senza paura di fallire, incoraggiando l'innovazione e il miglioramento continuo.
- Utilizzare piattaforme e forum online per condividere le conoscenze e supportare gli insegnanti.
- Adattare l'uso degli strumenti digitali alle esigenze specifiche dei diversi gruppi di studenti, assicurando che gli strumenti siano selezionati sulla base di esigenze identificate come l'impegno, la collaborazione o l'accesso alle informazioni.

Focus su alfabetizzazione e competenze digitali

- Implementare programmi incentrati sugli studenti che si concentrino sul miglioramento dell'alfabetizzazione digitale, del pensiero critico e della capacità di utilizzare efficacemente gli strumenti digitali, come ad esempio l'uso sicuro di Internet, l'identificazione di informazioni credibili e la comprensione delle implicazioni etiche dell'uso della tecnologia.
- Integrare le competenze digitali nel programma di studi per garantire che gli studenti sviluppino le competenze digitali di base e siano preparati alle esigenze della forza lavoro e della società moderna;
- Fornire programmi di formazione mirati che si concentrino sull'insegnamento agli educatori di come utilizzare efficacemente gli strumenti digitali per ispirare e coinvolgere gli studenti.

Promuovere approcci e strumenti digitali innovativi

- Incoraggiare l'uso di piattaforme di distribuzione dei contenuti, strumenti di analisi dell'apprendimento, applicazioni di collaborazione e comunicazione e strumenti di valutazione e feedback per migliorare l'esperienza di apprendimento.
- Promuovere l'uso di tecnologie innovative come l'intelligenza artificiale e la VR per creare esperienze di apprendimento immersive e coinvolgenti.

- Stabilire meccanismi di feedback per gli educatori e gli studenti per condividere le loro esperienze e le loro sfide con gli strumenti digitali, assicurando che le loro esigenze siano affrontate in modo tempestivo.
- Promuovere politiche che incoraggino l'integrazione della tecnologia per facilitare la valutazione e il feedback dell'apprendimento.

Queste raccomandazioni mirano a promuovere una visione nuova, più coesa e inclusiva dell'educazione digitale innovativa, affinché gli educatori e gli studenti possano muoversi con sicurezza in un mondo sempre più digitale.

Le fasi successive del progetto, che prevedono la progettazione e lo sviluppo di programmi di formazione mirati, si baseranno sulle raccomandazioni raccolte attraverso l'indagine per affrontare le esigenze e le lacune individuate e promuovere un ambiente educativo più innovativo e inclusivo.