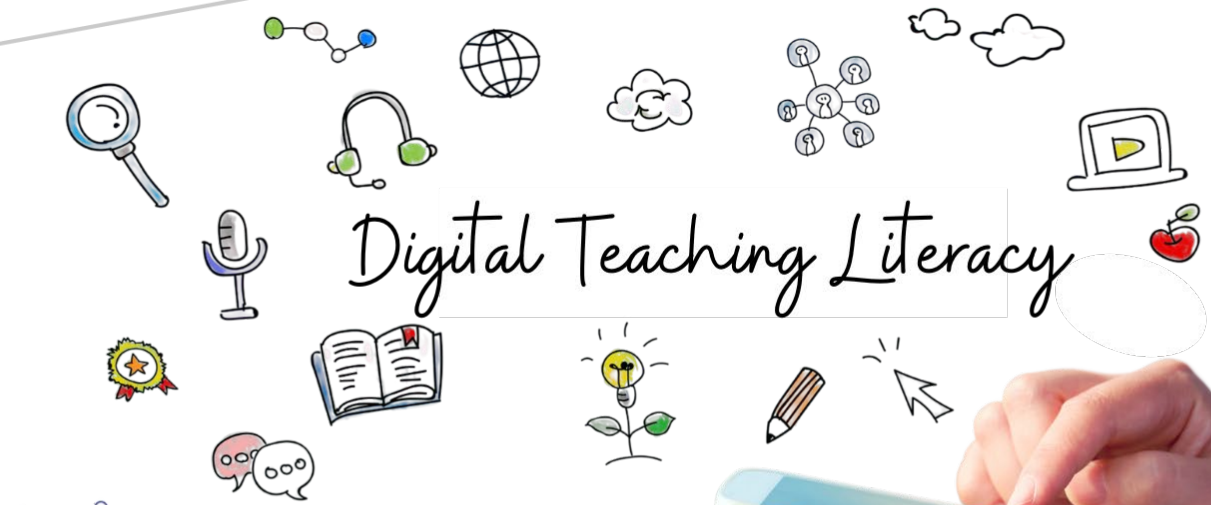

DigiTeaL

TECHNICAL GUIDELINES

University of Bucharest – October 2022

Abstract

Guidance produced in discussion with teachers, about five technical teaching topics.

DEMOKRITOS

Emphasys CENTRE

UNIVERSITY OF WOLVERHAMPTON

UNIVERSITATEA DIN BUCUREȘTI

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1. BACKGROUND

These guidelines have been created to cover five technological topics, identified in Phase 1 of the DigiTeaL project through surveys, focus groups and interviews with teachers, which led to the creation of the DigiTeaL framework.

The national and comparative results of the Phase 1 data collection are available to read online.

In Phase 2, we spoke again with teachers to ask for more information specifically about the five technological topics, and recommendations and best practice from these discussions are presented below.

2. GENERAL DESCRIPTION OF PARTICIPANTS

Interviews and focus groups took place in all partner countries. Depending on what was most convenient for the participants, these were carried out either in-person, over the phone or via online meeting systems such as Zoom or Microsoft Teams.

Cyprus

At the focus groups in Cyprus, five educators took part - two of them with a background in primary education, two in secondary education and one with experience at both levels. All educators had a different educational background, teaching lessons related to ICT, STEAM, Biology, English and Mathematics.

Germany

Five German teachers and professionals in the field of education with experience in teaching online classes took part in the focus group, which was partly held in an online zoom session and in email conversations. The participants were: two secondary school ("Gymnasium" – high school) teachers (subjects: Spanish, French, German, Music), one teacher at a professional college (subjects: English, Health) and one college lecturer (area: social work and ethics).

Greece

In Greece, five teachers in total took part in one-on-one focus groups, which were held both in person and virtually, through the phone or via zoom. Three of them were primary school teachers and the rest were secondary school teachers.

Romania

In Romania, one focus group (with eight teachers) was conducted online, through Webex platform with school teachers. All teachers were school counsellors for primary and secondary schools located in Bucharest.

United Kingdom

In the UK, 5 teachers took part in focus groups. Three were secondary school teachers working in mainstream schools. One was a college teacher in mainstream education. One was a college teacher working in special educational needs (SEN) education (the other teachers had experience of working with students with SEN). They taught music, maths and drama (school), physical education (PE) and economics (college).

3. FINDINGS AND BEST PRACTICE

3.1 Introduction to Online Teaching

Best Practice:

- Bring useful elements on online teaching into face-to-face teaching.
- Keep practising online teaching skills even while fully face-to-face, to maintain development.
- Create a troubleshooting guide for common technical problems in the specific software used by your school.

For millennia, teaching has been an act performed face-to-face. Teachers used to travel thousands of miles in order to reach an imperial court or a far-reaching school just to be able to impart knowledge to pupils/students, and this was the case until the 1990s when internet started to spread worldwide thanks to fibre optic cables (Web 1.0), doubled by the spread of Web 2.0 from the 2005. This technological development, together with the fast development of computers, laptops, and the smart devices made possible a new way of teaching, online teaching. Numerous studies were being made about the positive and negative consequences, intentional and unintentional that the hours spent in front of a device and online teaching might have on the mental, physical and cognitive development of pupils/students.

Unfortunately, 2020 brought us an unprecedented reality, in which we had to spend most of our days indoors, and thus, for a period of time (with variations from country to country), teaching was done exclusively online. This new reality was challenging not only for teachers and students, but also for schools, colleges and universities, and for parents.

The main problems faced were:

1) Logistic:
   - lack of internet;
   - weak connection to the internet;
   - lack of money needed for an internet subscription;
   - the absence of technological equipment.
2) Knowledge-related – divided into 2a) digital literacy and 2b) the way the knowledge was transmitted by teachers and received by students
   a) digital literacy
      - low level of teachers' digital literacy, which meant that teachers encountered problems in using online platforms, or finding creative ways for online teaching;
      - low level of students' digital literacy, meaning difficulties in using devices and platforms.
   b) the way knowledge was transmitted by teachers and received by students
      - teaching was done online in a fashion similar to face-to-face;
      - teachers reported the inability to cover their entire curriculum – initially designed for face-to-face learning and adapted on the go;
      - teachers reported learning losses for students and learning gaps between students depending on their socio-economic background;
      - giving feedback to students and guiding the ones that need one-on-one interactions;
      - difficulties in teaching art-based disciplines.

The majority of the participants from Cyprus, as those from the other countries (Greece, Romania, UK, Germany) faced some challenges when adapting to online teaching, but at different levels. Bad internet connection and lack of appropriate equipment was one of the most common challenges faced by the participants, with one participant also mentioning the need to further develop his digital skills to be able to adapt to this new reality.

However, by spring 2022, all participants felt confident to deliver and prepare lessons online, and with the benefits they encountered, they would like to adapt some of those methods and tools during face-to-face sessions.

One of the biggest difficulties teachers faced in Greece, was the lack of appropriate equipment for their online lessons, which was not provided by many schools. Also, while there were several training sessions, some teachers had many difficulties with new technologies, and their solution came mainly from cooperation between teachers.

In Romania, after the first 6 months of pandemic, the Government arranged to offer tablets with internet connection to most of the pupils, but new issues aroused: most of those from medium and low income families (and their parents) did not know how to use and set them; there were lot's of teachers who lack access to devices or high-quality internet.

Also, the teachers in UK faced similar issues, more then half of them saying that bad internet connection was the main obstacle, followed by the lack of appropriate equipment. Also for the students these were the top problems they have to overcome.

In Germany, the biggest challenges every participant experienced was dealing with the technological aspects and the poor access to fast internet for many of the students (especially living in the countryside, where the coverage is poor). Also, the teachers struggled with providing the usual spectrum of pedagogical methods and differentiation. Things like making sure that all the students have access to learning material, online lessons and don't struggle with the software and the digital learning tools was of utmost importance. There were held urgent meetings at the beginning of the pandemic to decide on what learning platforms, appropriate communication methods should be used in each school and also to create mechanisms for troubleshooting.

Because online teaching was something unexpected, it was a challenge for teachers who were not well prepared. In the beginning they were much more familiar with asynchronous online teaching, i.e. preparing a lesson in advance and sending material to students to view in their own time. There were also ready-made repositories and tools for sharing educational materials even before the pandemic and teachers were quite familiar with them. Synchronous online teaching put them at a loss at first (how to behave, in what ways to get students' interest, etc.) and they were resistant to this way of teaching.

Experience as regards online teaching and its practical application are considered necessary to familiarize teachers and students. Thus, most of the teachers consider it appropriate to apply it also in periods when it is not considered absolutely necessary, in order to be prepared for any periods when it will be necessary to apply it.

It also seems necessary to create a repository of basic troubleshooting for problems that teachers may encounter during their online teaching, so that they can refer to it when necessary.

3.2 Online Communication and Collaboration

Best Practice:

- Adapt to your students, and use email or chat communication as preferred for best results.
- Be flexible – use different communication methods for colleagues, parents and students.
- Communicate regularly with parents about students' progress – parents can also help to communicate with the student.
- Use apps both during lessons and to create interactive content before your lessons.
- Make online/video tutorials before lessons to share and apply theoretical content.
- Encourage students to wear headphones, so that other family members do not listen in and interrupt lessons.

In Romania, communication and collaboration were the main problems faced by teachers and students during the pandemic. First, the lack of digital skills made it hard for some students to use the platforms available in order to communicate with peers and teachers, and to take part in group projects. Second, the lack of physical interaction prevented one-to-one feedback and communication, which was replaced by individual online meetings and e-mails.

In order to surpass these problems or, at least, to reduce their impact, professors found a number of strategies to increase and improve the level of communication with their students and the level of collaboration among students:

- communicating with students through the help of their parents, which had the secondary effect of improving the mutual understanding between students and their parents;
- e-mails for some students, while for others chat-based platforms gave better results;
- online meetings with parents about students' progress;
- informal meetings among teachers to share online practices;
- the level of interaction and collaboration was raised by online quizzes, the use of the online equivalents of white/black boards, Padlet, maps and brainstorming charts;
- using apps to create creative and interactive content – Google Drawings, Powtoon, Kahoot, Microsoft Forms, Mentimeter, Canva, Hot Potatoes, Wordwall;

- making small tutorials in order to help students understand better how to apply theoretical knowledge – especially in art-based disciplines;
- taking online classes in order to improve digital skills and use of online teaching platforms, to learn methods of teaching online.

The participants from Cyprus expressed the need to communicate more with parents during online teaching, especially for younger ages. Some useful tools often used for online communication and collaboration were:

- Microsoft Teams
- Zoom
- Instant Messaging Apps - Viber, WhatsApp – create one group for the class and one for the parents to enhance communication.
- Discord – used to create a community to engage with students
- Emails to communicate with colleagues and parents
- Google Drive – an easy way to for students to collaborate and give feedback

In Greece, the overall experience was good regarding the communication and cooperation tools provided, but there was difficulty in differentiating communication and cooperation with the different target groups. That is, different tools were needed for parents and colleagues, and different ones for students, to make communication and collaboration more fluent and spark students' interest.

The respondents from UK showed a preference for Microsoft Teams to deliver training with Zoom, BongoLearn and an institutional system also being used. But, as teachers from the other countries did, the online teaching process was not uniformed, so a wide variety of learning management systems were used to better adapt to the students' needs. Some examples are:

- Moodle
- Brightspace
- Edmodo
- Teams 365
- SMHW
- DB Primary
- Institution's own system

In Germany, an important goal for most of the participants was to minimize the number of platforms and tools used and to find a universal tool, that incorporated all the needed functionality (learning platform, classroom management, messenger and online conference tools in one place) and to make sure the tools were safe and followed the German Data Protection Ordinance. Anyway, there were differences between schools and the solutions they applied for online learning.

There were some schools that already used a learning platform where learning material and learning output could be uploaded and shared, so the teachers and students were already equipped with competences in their collaboration system. But, generally, each school could freely decide what platforms and tools they would use. The main platforms used were:

- Moodle
- Bigbluebutton
- Logineo NRW - a learning and classroom management platform set up by the North-Rhine-Westphalian ministry of education.

Teachers from all the countries mentioned also one challenge that occurred during online teaching was that, without the teachers wanting it, parents were also involved in their children's teaching and interfered, making it difficult to collaborate with students. This caused tension among teachers, who would like to more easily set boundaries with parents and find ways to prevent parental participation during online teaching. One possible solution suggested by teachers is for students to wear headphones so that lessons are not heard by other people at home.

3.3 Digital Tools for Preparing Lesson Plans and Interactive Activities

Best Practice:

- Take advantage of the online tools available to make online learning more interactive and engaging – online quizzes, media, brainstorming tools, drawing tools etc.

- Online teaching easily allows for asynchronous communication. Consider whether that could benefit your learners e.g. providing instructions or tutorials in advance of lessons.

- When lesson planning, have a back-up plan in case there are technical problems with a specific tool that can't be resolved quickly.

- Consider that students from different socioeconomic backgrounds may have more or less access to and familiarity with technology, and provide instructions suitable for the lowest level of competence.

- Make sure the apps and activities you use aren't testing students on their technical competence, rather than on their subject knowledge.

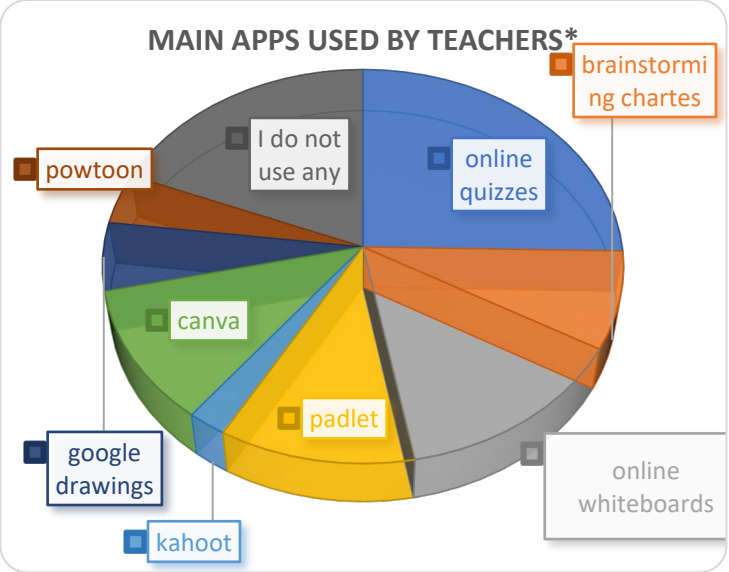
Considering teachers as designers of the instructional and learning process requires emphasis of their role as strategic planners: choosers of the necessary tools for creating particular lesson plans or instructional materials, as well as of the implementation and management of the overall design educational process.

As previous experiences with online learning before the pandemic proved, online learning is based more on materials (readings, videos, exercises, etc.) than on direct personal interactions (discussions, presentations, etc.). This offers the opportunity to integrate more media (video, images, audio, etc.), but teachers should produce or find good materials and be able to leverage them; on the other hand, it requires students to be more autonomous in learning, using all kinds of media applications.

As for guidance, online learning relies on mediated communications, either synchronous or asynchronous. In both cases, indications from teachers should be spelled out very clearly and carefully, as progressive refinements through interactions are hardly possible (Rapate et al., 2020).

The fruitful data gathered through the DigiTeal project within the five member countries show that there are some online applications that could be successfully used by teachers in order to foster learning through digital technology. One of the great advantages of digital technology is its generalized worldwide access, meaning that most of the resources used by teachers for designing interactive activities with students are available in many countries.

From the Romanian teachers' answers can be concluded that the best applications used for fostering the interaction with students are: online quizzes, brainstorming charts, online whiteboards, Padlet, Canva, Google drawings and Powtoon.



Useful apps*	average %
online quizzes	78%
online whiteboards	43%
padlet	34%
canva	34%
brainstorming charts	25%
google drawings	17%
powtoon	13%
kahoot	7%
I do not use any	58%

**According to DigiTeal project research results in Romania – Phase 1*

Other applications mentioned by Romanian teachers to bring interactivity during online lessons were: Evernote, Mentimeter, Word wall, Learningapps, Bookcreator, Storyjumper, Livresq, Jamboard, Mozabook, Live worksheets, etc.

In Greece were launched some "national" educational platforms and apps, like the new informative portal called "We learn at home" (https://mathainoumestospiti.gov.gr/) that acted as an aggregator for all digital tools in order to help teachers and students to find everything they need in one place. Other platforms used as tools for communication, collaboration, sharing or developing, designing, writing, evaluation and presentation of digital interactive teaching scenarios were: Aesop, Photodentro, e-Me, or The Online School.

Participants in Cyprus argued that digital tools were key to the successful delivery of online sessions, but this took some time and research. Some useful tools mentioned are:

- Kahoot! – to create interactive quizzes; students could still have access to the quizzes for self-assessment later.
- Interactive Whiteboard used for lessons delivery.
- TinkerCad: Used for STEM courses, allowing students to create 3D designs, and receive feedback.
- Brainstorming Activities: Mentimeter, Miro, Padlet
- Lesson Plans and Lesson Activities – Templates and Ideas
- Create more engaging presentations using Prezi and Canva

To enhance interaction with learners the most popular option for teachers in UK were online quizzes and whiteboards, Padlet, Kahoot and brainstorming charts. Even not all the teachers used any tools to create educational content, those who did it, preferred different tools, as: Google Draw, Powtoon, Kahoot, Microsoft Forms and Mentimeter.

Turning your creativity and imagination to design lesson plans and activities for use in online teaching requires familiarity and experience in using various tools, and seemed quite difficult for teachers. When they were able to use different tools properly, the students responded well and showed interest, giving teachers the motivation to create such interactive tools. Without the use of such tools, it was frustrating to see the lack of students' participation. Unfortunately, for most lessons there was no provision in the lesson plans for how they could use tools to make them online, and teachers relied on their own willingness to research further and discover them.

In Germany, a special attention was given to the classroom time – management: to leave enough room and time in the lesson plan for technical troubleshooting (internet, or technical issues): *"if you think you've planned enough time for that, then go ahead and add 10 minutes more"*. Also, the teachers felt often that they had to somehow compensate for the lack of physical presence and impact on the students compared to being present in a classroom, but through practice they've learned that *"a good online lesson is not a firework of online tools and methods"*, pointing out the difficulties of keeping students motivated and attentive from the "*small square on the display*".

The German teachers agreed that over time they learned to use online tools that were multifunctional and could provide a variety of different activities (e.g. padlet, excalidraw, cahoot, taskcards, built in tools inside online conference tools) and not to switch too much between different platforms and tools. Also, playing ice-breaking games with students proved to be a good method to engage students and foster the community feeling of a class.

When planning lessons using educational apps, teachers should consider the main advantages and disadvantages of their use, to adapt and individualize the didactic process to students' specific needs.

The main advantages of using educational apps proved to be:

- convenient accessibility – they are downloadable on any smart device, using cloud storage.
- communication with anyone globally with internet access.
- increased student engagement – these apps are energizing and entertaining, children like to use them and their learning motivation increases due to the ease of learning using interactive images, storytelling and PPTs or videos.
- can be used anytime, offering students control over their learning activities
- cost-effective – most of these apps are free of charge, or at least their basic features can be used without payment.

There are also disadvantages of using educational apps, such as the following: unexpected software and hardware issues that might not be solved during the lesson, meaning new learning strategies should be found; longer time needed for preparing lessons; restricted feedback or the lack of a direct response, because teachers in this situation provide feedback but do not have enough time to deal with each pupil individually and explain everything in depth; disparity among children due to lack of technology knowledge and uneven level of digital competences development.

In general, children from higher socioeconomic situations will have greater access to digital equipment and will be more competent at using it. This gap raises the idea that educational technology could contribute to learning inequity, meaning teachers should carefully analyse and decide when and how they will use educational applications in learning, especially considering: does progress on an education app genuinely reflect a kid's mastery of the subject matter, or does it examine if a youngster has technological expertise?

As a conclusion, the great diversity of educational apps offers almost unlimited opportunities to raise interactivity during online lessons, but also brings disadvantages and could increase the educational gaps between students' increase. Our research found that more than half of participating teachers did not use any apps to increase interactivity and help students keep their interest in learning during online lessons, due to a lack of confidence in their own digital competences, or due to technical issues (internet connection, digital devices).

Because many of these apps could be also used in a digitalized classroom, during face-to-face activities, our conclusion is that all the teachers should try and integrate them in the classroom, to expose all the children to the capabilities of the online educational tools, offering them diverse learning experiences and integrating digital technology in all classrooms, online and offline alike.

On the DigiTeaL website, there is an exhaustive list with existing educational applications that could be further exploited in order to increase learning interactivity and learners' digital competences.

3.4 Digital Tools for Assessments and Feedback

Best Practice:

- Use the apps you and your students are already familiar with for assessment – if you already use a lot of online quizzes in your lessons, you can use these for assessment as well.

- Consider maintaining these apps as a part of your formative assessment in face-to-face teaching.

- For more physical or performance-based subjects, you may be able to provide instructions for students to perform an experiment or activity at home, and upload a video or report of their results for feedback.

Assessment is the complex process of gathering information on what students know based on their educational experience, to identify areas where improvement is needed and ensure that the learning objectives were attained. Generally, for either online or face-to-face lessons, there are two basic types of assessments:

- formative - used continuously, to determine how well a student is learning the material. They are best when ongoing, consistent, and providing critical feedback to learners.
- summative - (sometimes referred to as a final exam) measure what the student has learned after completing a chapter, module or entire course. They can also validate how well the content (proposed by the teacher) supports the course's overall learning goals.

Assessments are more than just grades, even if students consider that only grades express their involvement in learning. When meaningful and well-constructed, assessment helps students gear up for success by challenging them to reflect, interact, and apply their knowledge to answer questions, solve problems, and communicate information.

The teachers' responses gathered from the five countries involved in the DigiTeal project highlighted some issues regarding the evaluation process during online lessons, with summative grades being higher (Romania and Greece), or lower (Cyprus and UK) in online than in face-to-face lessons. In addition, lack of internet access or quality of digital devices were other negative, sometime incontrollable factors that influenced evaluation errors. In Germany teachers from different schools and colleges tried hard to find different strategies to deal with this issue of evaluation error, being more difficult to make sure that the students did their assignments and tests on their own without any help.

Regarding the online tools that teachers used for assessment and feedback, generally the same online tools used for creating interactive lessons could also be used as a formative or summative evaluation strategy: online quizzes or polls, essay questions or online interviews, games and drag-and-drop activities. Furthermore, presentations, photos with tests on paper, or portfolios were used for evaluating students' accomplishments.

Regarding assessment and feedback, one Biology teacher from Cyprus said that she would give instructions to students and parents on how to conduct an experiment, and would ask students to perform the experiment and share their results in a Google Doc with a short description where she could also give feedback. Another participant mentioned that Google Forms was used to replace written exams, providing the option for open answers and multiple-choice questions.

One difficulty that Greek teachers encountered was that they could not know whether students were completing assessment and feedback activities on their own, which can of course also be an issue with face-to-face teaching. Through experience, they found it was good to use fun assessment and feedback activities in order to attract students' interest and attention.

However, most teachers continued to use the familiar ways of assessment from face-to-face teaching, i.e. students wrote test answers by hand and sent them to teachers through photos. Some teachers required the students to place their web camera so that their hands were visible during an exam or a test, some allowed "open book exams" and others switched to forms of oral assessment more frequently.

Finally, there was also the view that it was much more important to improve the online mode of delivery and leave assessment for last.

Some digital platforms used for connecting online teachers with students proved to be a valuable resource for management of the assessment process, offering spaces for organizing and keeping all students' work together, such as Google Classroom, or national educational platforms like Kinderpedia or Adservio (Romania), Aesop or e-me (Greece), Edulinkone (UK). In Germany, the secondary school teachers enjoyed exploring different online assessment tools like Kahoot or the built-in quiz function of some online conference tools and the students seemed to enjoy those playful quizzes more than ordinary tests.

However, generally speaking, although during the pandemic each national Ministry of Education offered some support for teachers – especially training and access to digital resources – each school had to choose which online learning platforms and tools to use, according to its specific situation.

The lessons learned from the online school experience during the pandemic show that some online educational apps are a valuable resource for formative and summative assessments, and could be used for ongoing evaluation of students during online and offline lessons alike, due to their valuable formative qualities:

I. Online quizzes are ideal for measuring learning results across a wide audience, being a versatile tool that can be used: prior to start the lesson, to gain a measure of student's existing knowledge, or after the lesson, to measure their understanding of the subject. They can have different types of items, and are an excellent way to engage student learning. Some already tested online quizzes educational apps are shown in Annex 1.

II. Game-type educational activities –turning a series of test questions into a game. They are considered "fun", and not "tests", so they are generally a good indicator of true skills and knowledge. Besides, they have been shown to enhance learning by promoting the development of non-cognitive skills, such as discipline, risk-taking, collaboration, and problem solving. From solving puzzles, crosswords or playing a "word wall" or kahoot game, students learn through playing, offering teachers the opportunity to realize formative assessment. Some already tested game-type educational apps are shown in Annex 1.

III. Presentations, books or video apps offer students the opportunity to be actively and creatively involved in producing an educational material, that can be formatively and summatively evaluated by the teacher. Students are usually excited by educational activities like completing a portfolio, or even participating in a contest, and relevant online apps prove to be a valuable resources (examples on DigiTeaL website).

Another useful tool that the online environment offers for formalizing assessment in online learning is the Open Badges standard. Few teachers from the five countries involved in the DigiTeal project are aware of this standard (about 25% of the teachers heard about it, and less than 10% used it). Open Badges is a standardized method for packaging in a verifiable digital form information about accomplishments and skills gained by a student after completing a specified learning activity.

Open Badges can be issued, earned, and managed by using a certified Open Badges platform and they act as “portable credentials”. They can be individualized according to each course content and objectives and there are several online platforms where they can be created for free.

Open Badges are designed to serve a broad range of digital badge use cases, including both academic and non-academic uses, but their utility is larger because they increase learning motivation for the acquisition of recognizable knowledge and skills. The DigiTeaL project has a user guide for teachers who would like to set up an Open Badge.

Summarizing, learning assessment and feedback could be digitalized and integrated within the online educational process, considering the multitude of applications that could be used by any teacher in order to give formative or summative feedback.

3.5 Online Safety

Best Practice:

- Only allow online class access to people invited with a link using a unique code.
- Accept people manually in the online class so you know who all the participants are.
- Switch off the option for students to chat among themselves, leaving just the option to send messages to the teacher.

The rapid shift from traditional (face-to-face) teaching activities to online education raised a number of issues related to online security and privacy. Research conducted during the Covid-19 pandemic (Klaif et al, 2021; Lassoued, Alhendawi & Bashitialshaaer, 2020) indicated the existence of varying levels of concern among teachers and students regarding the protection of personal data, disruptive intrusions into online teaching, inappropriate content and cyberbullying.

Participants in focus groups mentioned that initially they encountered safety issues, but those issues were resolved through time. In Greece, there was a lack of familiarity with regard to online security and it would have been very useful to have better information. One of the major problems with the online courses was that sometimes people who were not students and just had the course link would enter the course, with the intention of mocking and disrupting the course. By contrary, in Germany there was a strict data protection ordinance and parents of underage students were extremely careful with sensible data of their children.

In UK safeguarding has been a key issue for remote learning. NSPCC (2021) state that Government guidance for schools in England advises that schools should add an addendum or annexe to existing child protection policies and procedures, outlining how they will keep children safe during the coronavirus pandemic. These suggestions referred to:

- ‘reinforce existing child protection procedures
- highlight any new ways of working during this period
- explain how your organisation can continue to contribute to multi-agency child protection meetings and plans
- clarify any changes to your code of conduct for staff and volunteers in response to new ways of working.’

Also, the UK respondent teachers explained the steps they used to made to protect their learners' privacy while online:

- Consent to record the session
- Not sharing students' photos or information without consent
- Using tools that protect students' personal data
- Inform students about personal data issues

After becoming aware of safety issues, teachers took clear steps in order to avoid disruptive intrusions in their online classes. Among those measures are the verification of the students' identities before accepting them in an online session, and avoiding sharing the meeting link on social media platforms. Other measures were some specific technical measures (such as changing security settings for the online platform) or specific ones (such as setting a password for students in order to grant them access to online sessions) (UK, Romania).

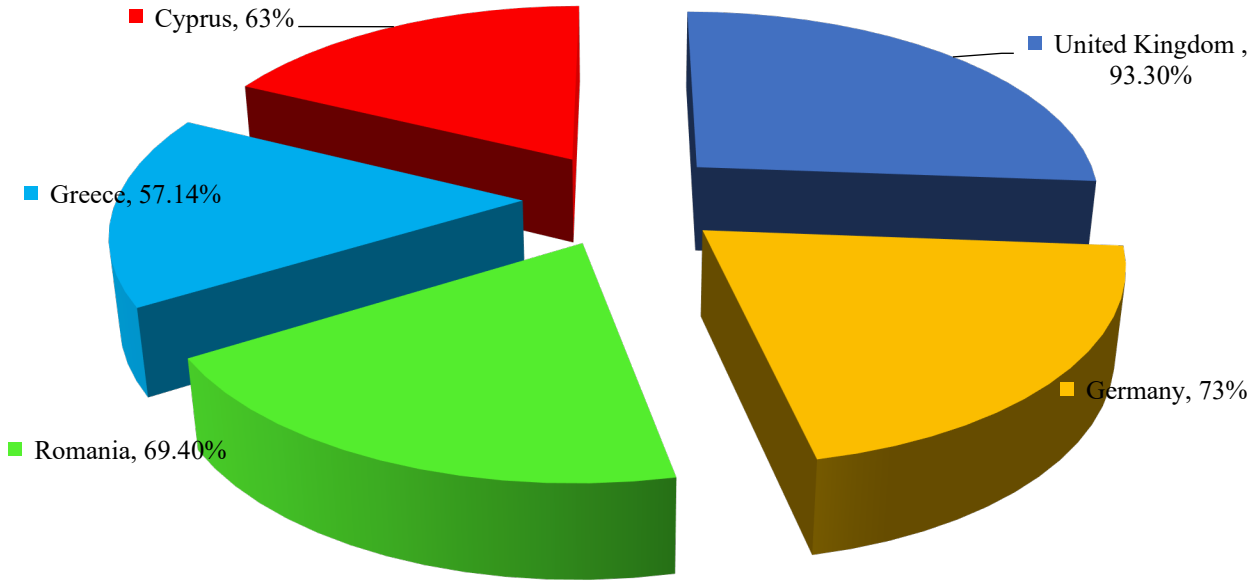
In addition, information was provided to students and their parents on how to protect themselves online by the Ministry of Education in Romania. Teachers had to do a lot of research into ways and techniques to ensure that the lesson was seamless and the students were safe. Solving the various safety issues was time consuming, consuming much of the 45-minute lesson. The teachers felt that a training session on this topic would be necessary.

In Cyprus, in regards to avoid disruptive intrusions during online class, the respondent teachers said they generally used to set a password for accessing online meetings, they verified the participants' identity before accepting them in the online session and avoided sharing the meeting in link in social media platforms.

In Germany, at the beginning of the pandemic "zoom" seemed the most accessible and ready to use tool for synchronous online classes, but after several security breaches and incidents where people hacked into online sessions and disturbed them and the fact that there are very low encryption standards (at least according to the German data protection ordinance) most of the schools switched to more secure tools.

It is interesting to note that, at odds with other existing research (Oliveira et al, 2021), the DigiTeaL project found that privacy was a concern for teachers. More than half of the teachers (with a peak of 93.30% for the UK) were aware of the GDPR regulations related to online privacy and security.

Teachers'awareness of the GDPR regulations



Another area of concern regarding online privacy and security issues was students' knowledge of the European online data privacy laws. Teachers from the five countries declared that they informed the students about personal data issues and about online threats such as inappropriate content and cyberbullying, in order to protect them. Additional measures taken by the teachers were obtaining consent to record sessions, not sharing students' photos or information without consent and allowing students to have their camera off during the online classes.

In conclusion, the measures taken by teachers to ensure online safety were adapted to the situation during the Covid-19 pandemic. For that reason, we suggest that additional measures are needed at the level of European institutions and online companies to address the challenges of the changing environment in terms of online security and privacy. A learning environment (digital and analogue) should be a safe environment for all students and learners as well as the teachers and this is the goal that every school should work towards.

4. RECOMMENDATIONS FOR SCHOOL ADMINISTRATION AND EDUCATION POLICY MAKERS

- Encourage teachers to keep practising online teaching skills, and providing training in this area.
- Share school-level technical and troubleshooting guides at regional and national level.
- Allow time for and promote informal meetings between teachers to share best practice.
- At school level, consider setting out expectations for parents and family, if you find they are interrupting lessons.
- At school, regional and national level, adapt lesson planning and training materials to show where interactive online tools could be used.
- Distribute a list of recommended online tools.
- At regional or national level, consider providing guidance on recommended online classroom organization platforms where students' work and assessment can be stored.
- Provide training for teachers on online safety, both in general terms and with specific troubleshooting for the commonly used online software.
- Prepare and issue guidance to students and parents on how to maintain their online safety from home.
- At national and European level, consider additional legislation around online safety, particularly for children and in an online learning context.

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