Joint methodological guidelines to design a smart lesson

Index

Premises

Digital transforms learning environments because it expands access to information and enhances the ability to continuously connect with the classroom. Among the various digital tools, the smartphone is the one that contributes the most to changing these environments because it enables the identification of information in real time and the instantaneous management of digital relationships. The change produced to the learning environments by the smartphone can undermine the root of classroom management, but it can also become an educational and training opportunity if managed in a specialized way.

SMART LESSON project aims to support teachers in this transformation process by providing technical and innovative ways to design and evaluate in-person and distance learning lessons

These methodological guidelines have been produced by the SMART LESSON partnership to support teachers in the change of paradigm required by the introduction of mobile technologies and, in particular, by the use of the smartphone as a didactic-educational and relational tool in different learning contexts (distance, blended and in-presence). The guidelines provide a theoretical and operational framework for all those teachers who want to design innovative lessons and evaluation processes, by exploiting the potential of smartphone as didactic tool.

The guidelines are divided in three main parts:

- Chapter 1: provides a theoretical framework with main theories and conceptual models related to digital and smart education.
- Chapter 2: explains the SMART LESSON approach to design a smart lesson.
- Chapter 3: provides practical and operative tools to design a smart lesson.

Chapter 1: Reference framework

1.1 Theoretical framework

In the 21st century, technology is playing a crucial role in our daily lives, and it calls professionals, educators, and learners reflect again over their basic beliefs in order to use technology for the re-design or re-engineering of education and training system. In addition, these technological devices play a significant role to help learners and teachers to get more advantages from it. However, the terms of electronic learning (e-learning), mobile learning (m-learning), digital learning (d-learning) and smart learning are used indifferently or in a complementary way to mean technological learning.

A review of literature shows similarities and differences between the above-mentioned terms that is useful to clarify for a correct use of the terminology as well as to understand the advantages and disadvantages of the different way of teaching and learning.

E-learning is "the learning supported by digital electronic tools and media"; m-learning is the "e-learning using mobile devices and wireless transmission" (Hoppe et al., 2003: 255) [1]; the "Digital learning is any type of learning that is facilitated by technology or by instructional practice that makes effective use of technology" and it occurs in all learning areas and domains (Victoria State Government, 2017: n.p.)[2].

1.1.1 E-learning

The e-learning term was originated in the mid-1990s (Garrison, 2011) [3] and the application of e-learning includes a computer-based learning as well as

---

[1] Hoppe HU, Joiner R, Milrad M, et al. (2003) Guest editorial: Wireless and mobile technologies in education. *Journal of Computer Assisted Learning* 19(3): 255–259.

[2] Victoria State Government (2017). Retrieved from www.education.vic.gov.au/school/teachers/support/Pages/elearningcurriculum.aspx

[3] Garrison DR (2011) *E-Learning in the 21st Century: A Framework for Research and Practice*. 2nd ed. New York: Routledge

web-based learning. According to Rosenberg (2001[4]) and Wentling et al. (2000[5]), e-learning is the use of Internet technologies that can provide a wide range of solutions to enhance knowledge and performance. It facilitates and enhances the learning through and based on the computer and communication technology. In addition, it can also support learning using a Wide Area Network (WAN) and it can be considered as a flexible learning.

1.1.2 M-learning

It is in 1960s by Alan Kay that the concept of the mobile educational device was established (Najmi and Lee, 2009 as cited in Pollara, 2011[6]). Kothamasu (2010[7]) argued that five basic parameters are used in m-learning:

- Portable: it is easy to carry such as PDA along with users everywhere, including a restroom and this can help learners to get information very quick and rapid.
- Social interaction, it helps to interact with friends to send messages. In addition, it also helps to exchange data with other people and get and gain some extra knowledge.
- Sensitive to the context: it helps to gather data (real data and simulated data) unique to the current location, time, and the environment.
- Connectivity: it helps to get a strong network where a learner can connect to mobile phones, data collection devices, and to a common network. Finally, in the case of customized, it is unique because it can help learners to customize learning information.

---

[4] Rosenberg MJ (2001) *E-Learning Strategies for Delivering Knowledge in the Digital Age*. New York: McGraw-Hill.

[5] Wentling TL, Waight C, Gallaher J, et al. (2000) E-learning: A review of literature. In: *Knowledge and Learning Systems Group*. USA: University of Illions at Urbana-Champaign, pp. 1–73.

[6] Najmi A and Lee J (2009) as cited in Pollara PC (2011) *Mobile learning in higher education: A glimpse and a comparison of student and faculty readiness, attitudes and perceptions*. PhD Thesis, Louisiana State University.

[7] Kothamasu KK (2010) *Odl Programmes Through M-learning Technology*. Retrieved from http://oasis.col.org/bitstream/handle/11599/2214/2010_KothamasuK_ODLProgrammes.pdf?sequence=1&isAllowed=y

According to Sharples (2009[8]) the design of mobile learning activities should be driven by specific learning objectives. The use of (mobile) technology is not the target but rather a means to enable activities that were otherwise not possible, or to increase the benefits for the learners. Thus, the use of mobile technologies may only be suitable for part of the activity, with other parts being better supported by other technologies, or by no technology at all.

1.1.3 Digital-learning

Digital learning is defined as "any instructional practice that effectively uses technology to strengthen a student's learning experience and encompasses a wide spectrum of tools and practices."[9]

D-learning can also facilitate new strategies and formats, namely, online and blending learning and the competency-based learning that has a potential in terms of contributing to the deeper learning (VanderArk and Schneider, 2012[10]). D-learning can promote three different ways to enhance the deeper learning such as personalized skill building, schools and tools, and the extended access (VanderArk and Schneider, 2012).

Wit and Dompseler (2017[11]) urged that the d-learning environment can consist of different components where learners and teachers can use as it is needed. Furthermore, they also stated that some of the components will only be available to all learners and teachers at the institution whereas others needed authorization. These components must be swappable between learners and teachers to adopt the latest development in the education and to the technological innovations. These components are namely organization of learning; testing; submission and assessment of assignments; management and use of student information; timetabling; internships and final projects; developing, managing, and sharing learning

---

[8] Mike Sharples, Inmaculada Arnedillo-Sánchez, Marcelo Milrad and Giasemi Vavoula, 2009, *MOBILE LEARNING Small devices, big issues*
[9] Office of Education Technology, Teacher Digital Learning Guide, https://tech.ed.gov/files/2021/01/Teacher-Digital-Learning-Guide.pdf
[10] VanderArk T, Schneider C (2012) How digital learning contributes to deeper learning. Retrieved from www.faithformationlearningexchange.net/uploads/5/2/4/6/5246709/__digital_learning__deeper_learning.pdf
[11] Wit MD, Dompseler HV (n.d.) How to create a digital learning environment consisting of various components and acting as a whole? Retrieved from http://www.eunis.org/download/2017/EUNIS_2017_paper_16.pdf

materials; education process support; learning analytics; communication; collaboration; multimedia; and freely available applications.

1.1.4 The concept of smart learning and smart education

Multidisciplinary researchers and educational professionals are continuously discussing the concept of smart learning.

Gwak (2010[12]) proposed a concept of smart learning as follows: first, it is focused on learners and content more than on devices; second, it is effective, intelligent, tailored learning based on advanced IT infrastructure. The technology plays an important role supporting smart learning, but the focus should not just on the utilization of smart devices.

Based on the generalities of different countries' smart education and the meaning of smart, the concept of smart education is proposed. Zhu and He (2012[13]) stated that "the essence of smart education is to create intelligent environments by using smart technologies, so that smart pedagogies can be facilitated as to provide personalized learning services and empower learners, and thus talents of wisdom who have better value orientation, higher thinking quality, and stronger conduct ability could be fostered ".

And based on this definition of smart education, a research framework is proposed in Fig. 2. This framework describes three essential elements in smart education: smart environments, smart pedagogy, and smart learner. Smart education emphasizes the ideology for pursuing better education and thus had better to be renamed as smarter education, which address the needs for smart pedagogies as a methodological issue and smart learning environments as technological issue and advances the educational goals to cultivate smart learners as results. Smart environments could be significant influenced by smart pedagogy. Smart pedagogies and smart environments support the development of smart learners.

Fig. n.2 – Smart education model

[12] Gwak D. (2010). *The meaning and predict of smart learning*. Seoul, Korea: Korean e-Learning Industry Association.

[13] Z.T. Zhu, B. He, (2012) *Smart Education: new frontier of educational informatization. E-education Research* **12**, 1–13
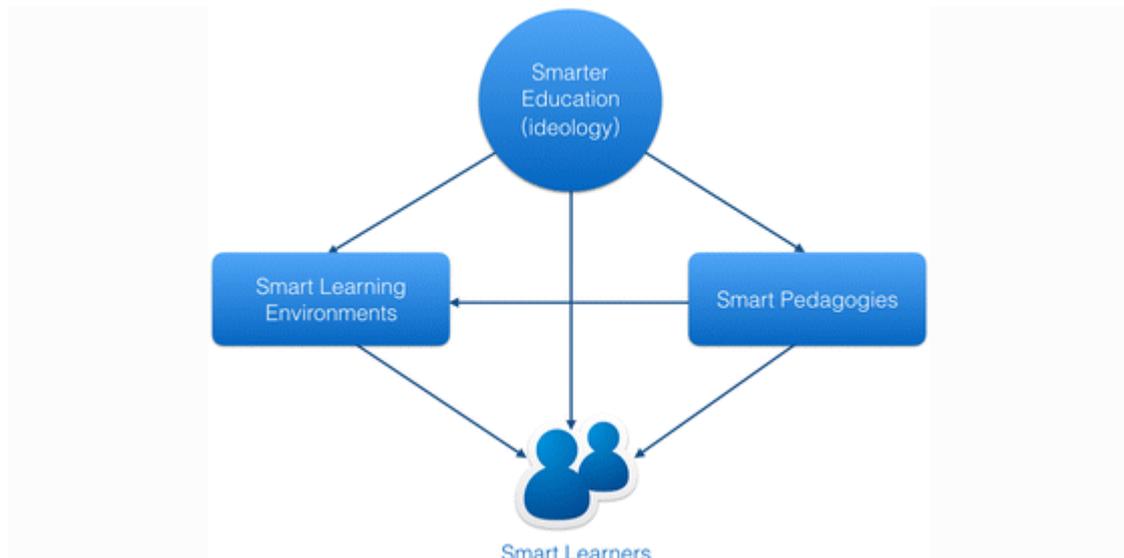
The development of new technologies enables learners to learn more effectively, efficiently, flexibly, and comfortably. Learners utilize smart devices to access digital resources through wireless network and to immerse in both personalized and seamless learning. Smart education, a concept that describes learning in digital age, has gained increased attention.

To situate students in authentic learning environments, it is important to design learning that combine both real and virtual learning environments. Seamless learning, which overlaps with some aspects of mobile learning and ubiquitous learning, is expounded as a one-to-one TEL model which learners can learn across time and locations, and they can convert the learning from one scenario to another conveniently encompassing formal and informal learning, individual and social learning through the smart personal device (Chan et al. 2006[14]).

Also, other intelligent technologies, such as cloud computing, learning analytics, big data, Internet of things (IoT), wearable technology and etc., promote the emergence of smart education. With these adaptive learning technologies, learning platform reacts to individual learner data and adapts instructional resource accordingly based on cloud computing and learning analytics, and it can leverage aggregated data across mass learners for insights into the design and adaptation of curricula based on big data (NMC 2015[15]).

---

[14] Chan, T-W., Milrad, M., and 15 others. (2006). One-to-one technology-enhanced learning: an opportunity for global research collaboration. Research and Practice in Technology Enhanced Learning Journal, 1(1), 3-29

[15] New Media Consortium, 2015, *The NMC Horizon Report: 2015 Higher Education Edition*, pp. 1–50

In addition, the IoT and wearable technology support the development of contextual learning and seamless learning. The IoT can connect people, objects, and devices. Learners carrying smart devices can benefit from various related information that is pushed to them from their surroundings (NMC 2015). Wearable technology can integrate the location information, exercise log, social media interaction and visual reality tools into the learning.

An interesting conceptual model of smart education is also provided in the article "Measuring Learning Outcomes Effectively in Smart Learning Environments" (2016[16]), where a smart learning cycle is defined. According to this model, the effective smart learning cycle consisted of three factors: mental system, learning behaviour and learning outcomes.

The key components of the mental system are motivation for learning, meta-cognition, and meta-volition. The mental preparation of effective smart learning includes arousing mental system of learners, developing the meta-cognition and enhancing meta-volition. The condition for effective smart learning is that learners have the motivation for accepting learning tasks and want to participate in learning activities. Different stakeholders in SLE such as instructors, learners and parents have multiple ways to communicate with each other to establish appropriate understanding on the relations between learning outcomes and learning behaviours.

Learning behaviours are two-way interactions between learners and learning environment, the objective of these behaviours is to cause the desired changes in what learners know and what they can do. These learning behaviours in SLE can be summarized as behaviours of information retrieval, information processing, information release and interpersonal communication.

Learning Outcomes are formal statements of what students are expected to learn in a course. Expected learning outcomes statements refer to specific knowledge, practical skills, areas of professional development, attitudes, higher-order thinking skills, etc. that faculty members expect students to develop, learn or master during a course. Learning outcomes should be SMART: Specific and simple – Measurable - Achievable and attainable - Realistic and relevant - Time-bound and targeted. Those learning outcomes should be resulted from the different interactions in Smart Learning Environments[17].

---

[16] Measuring learning outcomes effectively in smart learning environments, 2016, Sahar Yassine; Seifedine Kadry; Miguel-Angel Sicilia

[17] Measuring Learning Outcomes Effectively in Smart Learning Environments, 2016, Sahar Yassine, Seifedine Kadry, Miguel-Angel Sicilia

Fig. n.3 – Smart Learning Cycle
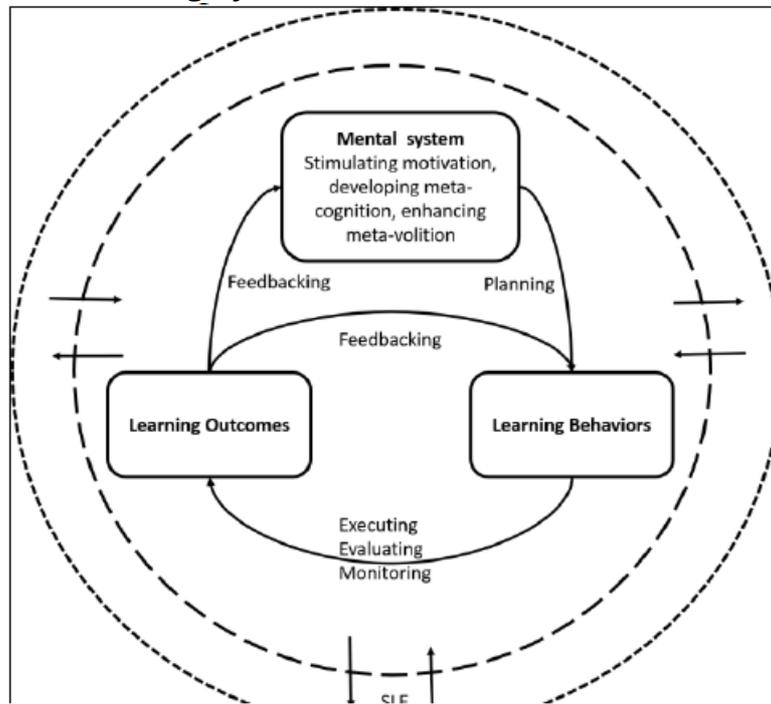
1.2 The state of the art: using technologies to develop new ways of teaching and learning.

Based on the research framework of smart education, the present paragraph describes some key experiences and practices of smart education in different countries and education systems.

Australia collaborated with IBM and designed a smart, multi-disciplinary student-centric education system (IBM 2012[18]). Their system links schools, tertiary institutions and workforce training. Australia aims to build a smart, multi-disciplinary student-centric education system using the following strategies: adaptive learning programs and learning portfolios for students, collaborative technologies and digital learning resources for teachers and students, computerized administration, monitoring and reporting, and online learning resources.

---

[18] IBM. (2012). Retrieved from Smart Learning Environments Journal Springer Open: https://slejournal.springeropen.com/articles/10.1186/s40561 -016-0026-2#CR33

The Victorian Department of Education and Early Childhood Development[19] has introduced smart classrooms in Victorian government schools as part of its reform agenda. Overall, the reform agenda is focused on the needs and interests of children and aims to improve students' learning outcomes. The smart classrooms bring together some of the most advanced classrooms in the world:

- New classroom design to create flexible, multiple-use spaces for students and for teachers.
- New teaching and learning technology, including interactive electronic whiteboards, mini-computers with learning resources and software, videoconferencing, cameras, screens, projection systems and table-top touch screens.
- New teaching and learning practices based on personalised learning programs for every student, which take account where students are up to in their learning and create challenges for them. The new learning spaces are designed to ensure all students have access to innovative new teaching practices, comfortable and adaptable learning environments and state-of-the-art technology that equips children and young people for life and work in the 21st century.

The smart education in Singapore also emphasizes the role of technology. Their goal is to foster engaging learning experience to meet the diverse needs of learners, through the innovative use of information and communications technology (Education and Learning Sub-Committee, 2007). To realize this, Singapore created an enriching and personalized learner-centric environment, and additionally created a nation-wide education and learning architecture for educational institutions and life-long learning. In recent years, as part of Singapore's national AI strategy, the Ministry of Education[20] is introducing innovative systems and practices:

- Automated marking systems: for primary and secondary English language assignments such as open-ended, short-answer questions and essays. These AI-powered systems will catch language errors such as in grammar, spelling, and syntax. The teacher will focus on higher level concepts such as marking for ideas, structure, content, creative expression, persuasiveness, and tone. MOE believes this will enable teachers to spend less time on routine assignments, giving them more time to design effective lessons and strengthen relations with students. Another benefit of the system is its ability to collect

---

[19] State of Victoria (Department of Education) 2023, *Department of Education Strategic Plan 2023–27*

[20] Smart Nation & Digital Government Office, Singapore, 2019, National Artificial Intelligence Stratgey

- data on common grammar mistakes so that teachers can work on these areas with their students.
- Adaptive learning system: enhanced by machine learning that can assess student performance in real time and adjust their learning pathways accordingly. In one school, students completed modules on maths subjects before class and teachers received reports on their performance. In the classrooms, the students were able to ask better questions about the subject and discuss how the maths could be used in real life situations. The teachers could also mix students of different abilities together so that they could do peer learning and teaching. Those working on the system are now taking in teachers' feedback, such as the need for more localised examples and the ability for students to enter their mathematical working into the programme.
- AI-enabled learning companion: it will be able to support holistic learning by motivating the student while he or she is doing a challenging task, encourage reflection on the learning experience, and recommend further learning activities. While the use of AI as a learning companion is still relatively new, there are promising areas to explore. For example, AI can be used to detect a student's engagement level with the study material by tracking the student's eye moment and the duration spent on specific parts of the document. For maths problems, the companion can identify the part that is presenting problems for the student and provide hints, resources, or prompts for an alternative method.

New York' Smart School program emphasizes the role of technology integrated into the classroom (New York Smart Schools Commission Report, 2014 [21]). New York proposed the keys for achieving Smart School as following: embracing and expanding online learning, utilizing transformative technologies, connecting every school using high-speed network, extending connectivity between inside and outside of the classroom, providing high-quality, continuous professional development, and focusing on foster 21st century skills.

In Finland smart education aims at using user-driven and motivational learning solutions to promote 21st century learning (Zgi-Ting et al., 2016 [22]).

---

[21] New York Smart Schools Commission Report, 2014

[22] Zhi-Ting Zhu, Ming-Hua Yu & Peter Riezebos, 2016, A research framework of smart education

They proposed a pedagogical network of educational institutions called "value network" that is the central of program. It has five categories as following: to understand user experience and usability, to receive expert feedback, to indicate learning outcomes, effects and quality of learning, to develop skills and expertise.

One aim of the curricula reform (2014) was to develop the learning environments: games and other virtual environments should also be recognized more often as learning environments.
- Technology plays an increasingly significant role in everyday school routines, allowing pupils to be more easily involved in the development and selection of their own learning environments.
- Discover what type of digital tools we use and how we use them to raise kids to prosper in the digitalised world of tomorrow.
- Technology is a significant element in learning environments.

From day-care services to doctoral studies technology is used as one of the several learning elements at each educational stage, starting from early education. The use of technology equipment is pursued step-by-step, as long as its use is learning enhancing, pedagogically useful and justified.
In early education smart devices are usually used as a part of physical learning or other activities, such as:
- exploring and photographing nature
- children making videos of their own role playing.
- motivating training methods for mathematics and reading skills.
At the basic education the use of equipment becomes more versatile as the pupils and their skills develop. Technology is a fantastic way to enrich learning, which pupils find highly motivating. When facing learning challenges, technology provides excellent training opportunities and helpful aids that truly help in individual learning.
Online J-Classroom is a district-based project (Zgi-Ting et al., 2016 [23]). that aims at providing micro-videos in pre-learning process for students. A data-driven instructional decision model is proposed for designing precision teaching interventions. Precision teaching is the educational decisions based on changes in continuous self-recording performance frequencies using the standard celebration charts (Lindsley 1992). The online J-Classroom platform has three major functions including resources co-building and sharing, data recording and analysing, cooperating, and innovating between teachers and students. The latest platform version is delivered in October 2015. Through monitoring and analysing the data of

---

[23] Zhi-Ting Zhu, Ming-Hua Yu & Peter Riezebos, 2016, A research framework of smart education

learning process, platform can provide personalized instructional design including direct teaching based on problem, problem solving oriented cooperative inquiry, and task-driven self-regulated learning for students. Students can be ensured to master all the knowledge after pre-learning as well as their self-regulated learning ability should be enhanced.

1.3 The use of mobile technologies in the partner countries: best practices

Partners of the Smart lesson project identified some of the most effective approaches developed since 2017 up to the year 2023 in the use of the smartphone as an educational tool throughout different learning experiences in the schools of the partners' countries, namely: Greece, Italy, Latvia, Romania and Spain. The table below shows the key best practices identified by the partners.

Best practices	Country	Objective/expected outcome	Methodology	Digital tool/technology used
Mobile Apps in the classroom	EL	Measuring elements	1-Teachers create quizzes and assessment. 2-Students work in groups and discuss the topics given. 3-Students complete the quizzes and they get real-time feedback.	Apps for Physics
Introducing Green Chemistry via implementation of Inquiry based project through mobile devices in	EL	Raising awareness on recycling materials by means of inquiry-based activities through which they will study	1-A questionnaire in Google form format is distributed among students to assess them on environmental issues and green chemistry principles.	https://wise.berkeley.edu/ https://docs.google.co

Greek Secondary Schools		the materials' properties	2-Students search about physical and chemical properties of tires, plastic, metal and ceramics on their smartphones to make proposals for their recycling. 3-By comparing these materials, students are guided towards recycling considering factors such as energy efficiency. 4-A survey is conducted to assess which principles students are aware of.	
Smart Generation	IT	Critical and conscious use of the smartphone.	1-Research on the digital needs of young people and adults to ensure a critical and conscious use of the smartphone. 2- Design of an educational tool bases on the best practices on the use of the smartphone. 3-Testing, evaluation, and validation of this tool in 70 groups. 4- Elaboration of a Recommendations Policy to	E-learning platform

			develop protection strategies and to stimulate and enhance the potentialities of the smartphone.	
Floating on magnetic fields	IT	Verifying the existence of magnetic fields on Earth and to measure their intensity.	Students collect different data to verify the existence of a local magnetic field by using the Magnetometer app.	Magnetometer app
Gamification of learning	IT	Creation of online interactive quiz games.	1- Students work in small groups to create an interactive quiz about Italian literature using Kahoot. 2-Students use their smartphones to answer the question shown on an interactive board. 3-SEN students work hand in hand with the most skilled students, being assigned different tasks throughout the making process.	Kahoot

Online quizz	LV	Testing the students' knowledge online.	-Individual & group work. -It allows teachers to both test students' knowledge using unconventional methods, and to deliver learning materials. -It allows importing lessons and materials from Google Classroom, Canva or Schoology.	Quizizz
Relevant Curriculum: Open Education for all	RO	Creation of templates and methodological guides for teachers.	Teachers learn to develop their digital skills by using the digital open resources uploaded on an online library to create their own learning material to be shared with their students.	Digital resources www.library.livresq.com
Scavenger Hunt	ES	Finding & identifying objects in the school's premises.	-Students are organised into small groups. -Students read a QR code which has been previously pinned up on the classroom's wall. -The QR code directs the students to the website "Top Worksheets". -Students make sure they understand the statements in the worksheet and walk around	Canva TopWorksheets QRCode Monkey

			the school premises to make their findings. -Students take pictures of their findings as a proof. -In class, students read their answers and show the pictures they take.	
Password Security	ES	Making sure of how strong students' passwords are.	-Students take a self-evaluation test about online security. -Students watch a video about the topic. -Students go to the given website and introduce their password to check how easily it can be hacked.	www.howsecureismypassword.net www.youtube.com
The human body	ES	Identifying the parts of the human body.	-Students work in pairs to identify the parts of the body on a drop-down activity created on the website "Word wall". -Students answer the questions they received via email and next they forward them to the teacher.	www.wordwall.com

Smart Education	Adult	ES	Effective use of digital technologies by using open pedagogies.	-Learners complete a quiz to find out about their digital skills level. -Learners develop their communication & problem-solving skills and increase their knowledge about their work fields and about the country where they live.	Smarty app Assessment toolkit www.smartadulteducation.com
ConTICgo		ES	Students' awareness in the prevention of hate speech in the internet.	Students use their smartphones to manage systems to report cases of violence and hatred in social networks and in the internet.	www.cibervoluntarios.com

Fig. n.3 – Breakdown of best practices per educational level, disciplinary content and partnership
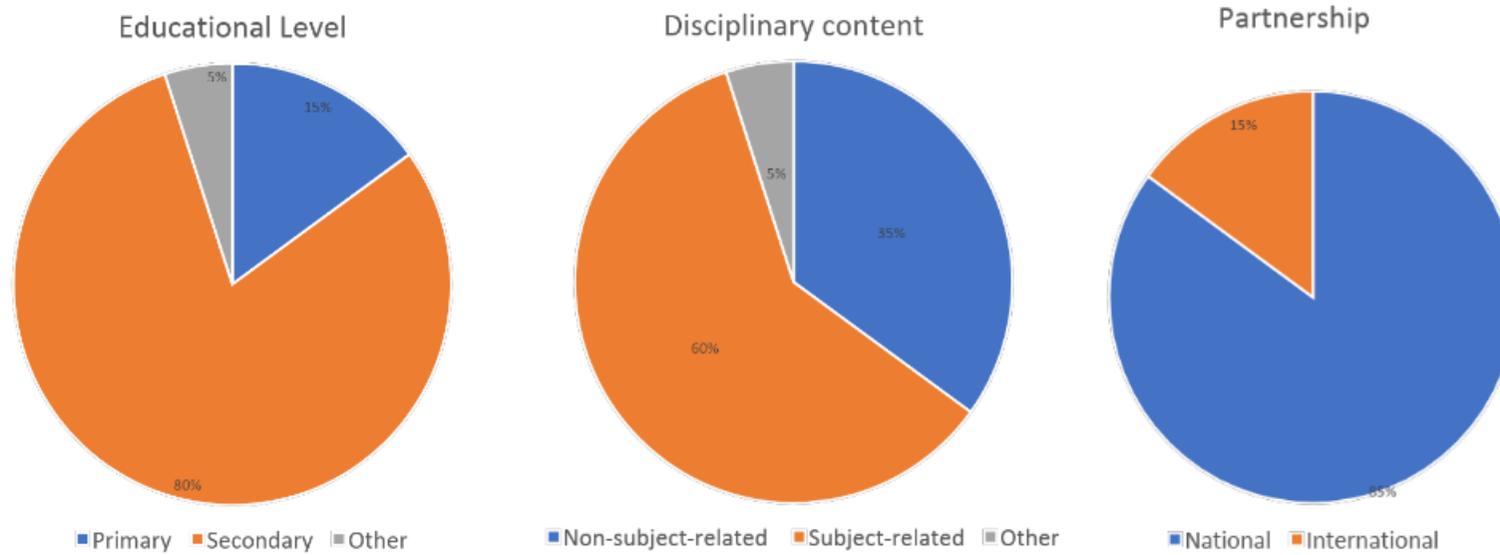
The analysis of the best practices highlighted positive impacts and improvements on the learning experience, teaching experience and other positive results. The table below summarizes the main positive impacts derived from the use of smartphones as didactic tool.

Learning experience	Teaching experience	Other improvements
1. Active learning and participation 2. Cooperative learning 3. Independent learning 4. Self-paced learning 5. More engaging learning 6. Digital and organisational skills development 7. Long-term knowledge retention 8. Raises awareness about the learning topic 9. Critical thinking 10. Analysing and verifying information 11. Participation	• They help teachers identify the students' learning needs. • They help teachers identify the improvements made in the learning areas • They allow teachers to customise materials • They help teachers increase their digital literacy • Teachers can find and use innovative methodological tools • Dynamic teaching	• Easy access to information • Easy use • Convenient in cases of home-learning • Immediate feedback to both teachers and students about the students' learning progress. • Better academic outcomes • Brings to the classroom a wide variety of topics for: raising awareness, discussion, identifying and verifying information, knowing about tools that they can use in many different situations in their everyday lives

12. Involvement in the learning process		23

The partners' best practices highlighted, as the literature showed, that focus of smart lesson is not only on the devices/tools but also on the methods of teaching, i.e., on smart pedagogies in order to make the lessons more engaging and interactive, giving more space to independent learning of students.

In summary, the use of smartphones as an educational tool offers many benefits that go far beyond than a powerful engaging and motivational device that provides easy access to all types of information. However, it also presents some critical points that need to be considered. Educators are the only ones who can develop effective strategies for integrating smartphones into the classroom and ensuring that all students have access to the resources they need to succeed in their learning.

1.4 Key features of a smart lesson

Combining results of the literature search and of the best practices analysis, some guiding principles and requisites have been identified as key features of a smart lesson.
In particular, the SMART LESSON project identified key features in relation to six different dimensions:

1) Learning goals/outcomes
2) Technology
3) Teaching methods
4) Learning styles
5) Learning environments
6) Evaluation/Assessment

KEY FEATURES OF A SMART LESSON	
1) Learning Goals/Outcomes	- to shift from rigid, structured systems towards more flexible competency-based curriculum frameworks - to make learning more engaging, personalized and adaptive - to foster workforce that masters 21st century knowledge and skills to meet the need and challenge of society
2) Technology	Intelligence technology plays an important role in the construction of smart educational environments. In smart educational environments, learning can happen anytime and anywhere. Technology may include: - Smart devices - Digital tools/apps - IoT and wearable technology (support the development of contextual learning and seamless learning.)
3) Teaching methods	Smart pedagogies should be differentiated and responsive to vary learners' readiness levels, interests and learning profiles. Some examples of the methods used in smart lessons are: - authentic activities in which learners work with problems in the real world; - inquiry based learning; - generative learning activities; - personalized instructional design including direct teaching based on problem, problem solving oriented cooperative inquiry, and task-driven self-regulated learning for students; - flipped classroom; - class-based differentiated instruction, group-based collaborative learning, individual-based personalized learning (interest-driven predominantly) and mass-based generative learning (through online interactions predominantly).
4) Learning styles	It encompasses various learning styles, such as formal and informal learning, personal and social learning, and aims to realize the continuity of learning experience for learner. In this learner are provided with personalized learning services as well as adaptive content, and according to their (learning) context and their personal abilities and needs. In a Smart Lesson learning is: - self-paced - self-regulated - adaptive - resource-enriched

5) Learning environments	-both real and virtual, student can learn across time and locations -flexible, multiple-use spaces
6)Evaluation/ Assessment	Smart learning environments and new technologies can record every detail of the students' learning behaviours. It also provides a good opportunity for instructors, learners, educational institutions, and researchers to acquire valuable and important information via analysing these behaviours. Learning analytics give instant feedback on learning behaviours and help learners identify the value of their study. LA can track and record the learning process and learning outcomes and provide the user with the proper learning content to fill that gap considering the user's context. In smart learning environment the assessment process is characterized by: - real time feedback; - focus on learner's self-evaluation - continuous monitoring and analysing data of learning process, to improve learning and teaching, support the development of the personalized and adaptive learning.

Chapter 2: The smart lesson approach

2.1 What is a smart lesson?

Considering the analysis of existing literature and the best practices, partners of the SMART Lesson project, after several in-person and online meeting, elaborated a joint definition of a "smart lesson":

 "***A Smart Lesson is a methodological approach to teaching that exploits digital technologies to improve students' learning experience, making it more interactive, engaging, up to date/timeless, collaborative, personalized and student-centered, facilitating the development of their digital competences and key competences for lifelong learning. The smart lesson facilitates the active involvement of key actors*** (teachers, school administration, families)."

A Smart Lesson is a pedagogical approach that harnesses the power of digital technologies to enhance the learning experience of students, fostering a more dynamic, engaging, and personalized learning environment.

The following key features characterize a smart lesson:

- Interactive: Smart lessons incorporate interactive elements such as simulations, games, and multimedia content to stimulate students' curiosity and encourage active participation.
- Engaging: Smart lessons employ creative and engaging teaching methodologies that captivate students' attention and make learning more enjoyable.
- Up to date/timeless: Smart lessons utilize digital resources that are current and relevant to contemporary issues, ensuring that students are exposed to the latest advancements in their chosen fields.
- Collaborative: Smart lessons emphasize collaborative learning activities, encouraging students to work together to solve problems, share ideas, and build mutual understanding.
- Personalized and student-centred: Smart lessons cater to individual learning styles and preferences, providing students with multiple pathways to acquire and apply knowledge.

- Developing digital competences: Smart lessons foster digital literacy skills, enabling students to effectively navigate and utilize digital tools for learning and communication.
- Fostering key competences for lifelong learning: Smart lessons cultivate transferable skills such as critical thinking, problem-solving, communication, and creativity, preparing students for success in their future endeavours.
- Active involvement of key actors: Smart lessons promote the active engagement of all stakeholders, including teachers, school administrators, and families, fostering a collaborative learning ecosystem.

At their core, smart lessons embody a transformative teaching paradigm that harnesses technology's transformative power to equip students with the 21st-century skills they need to thrive in an increasingly dynamic and interconnected world.

2.2 The smart lesson approach: starting from the competences

Smart lessons are a pedagogical approach that harnesses digital technologies to enhance the students' learning experience, creating a more dynamic, engaging, and personalised learning environment.

Designing a smart lesson starts with defining the competences you want to develop in students. Competences are knowledge, skills and attitudes that enable individuals to meet the challenges of everyday life and the world of work.

In the educational context, we could consider the following three categories of competences:

- Technical competences: specific competences related to the subject of teaching;
- Digital competences: these concern the ability to use digital technologies effectively for learning, communication and collaboration.
- Competences for life: these are transferable skills that can be applied in different contexts, are transversal and are essential for orientation and active citizenship. These include, for example, multilingualism,

learning to learn, critical thinking, problem solving, communication and creativity

Digital technologies can be used to develop students' skills in different ways. For example, they can be used to:

- Make learning more interactive and engaging simulations, games and multimedia content can stimulate students' curiosity and encourage them to actively participate in the lesson.

- Provide students with access to up-to-date and relevant resources: digital resources can help students stay up to date with the latest news in their field of study.

- Promoting collaborative work: collaboration platforms enable students to work together to solve problems, share ideas and build relationships.

- Personalising learning: digital technologies can be used to provide students with personalised learning paths based on their learning styles and preferences.

The smart lesson approach represents an innovative way of teaching that can help students develop the skills they need to succeed in the modern world. Starting with skills is a key element in designing effective smart lessons.

2.3 European reference frameworks

About the competences from which to start, the SMART LESSON project took as its reference two European frameworks:

- the Digital Competence Framework for Citizens – DigComp - and the DigCompEdu (Digital Competence Framework for Educators);

- the Key Competences for Lifelong Learning.

2.3.1 Key competences for Lifelong Learning

The key competences for Lifelong Learning are developed throughout life, through formal, non-formal and informal learning in different

environments, including family, school, workplace, neighbourhood, and other communities.

All key competences are considered equally important and aspects essential to one domain will support competence development in another. For example, skills such as critical thinking, problem solving, teamwork, communication, creativity, negotiation, analytical and intercultural skills are embedded throughout the key competences.

The Council Recommendation of 22 May 2018 on key competences for lifelong learning identifies[24] eight key competences needed for personal fulfilment, a healthy and sustainable lifestyle, employability, active citizenship and social inclusion:

- **Literacy**
- **Multilingualism**
- **Numerical, scientific and engineering skills**
- **Digital and technology-based competences**
- **Interpersonal skills, and the ability to adopt new competences**
- **Active citizenship**
- **Entrepreneurship**
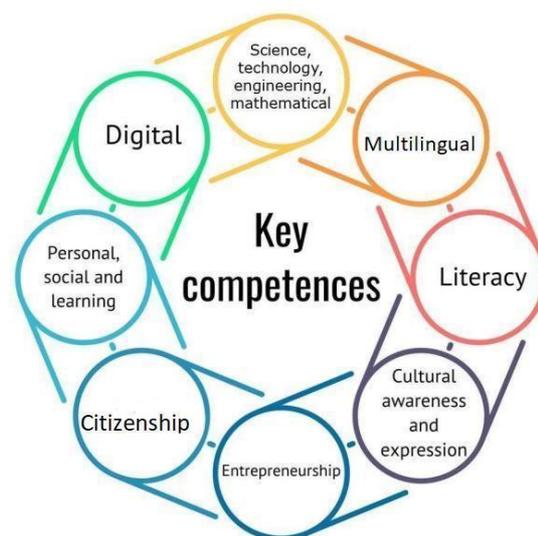- **Cultural awareness and expression**

Fig. *Key competences for lifelong learning, European Union, 2019*

---

[24] COUNCIL RECOMMENDATION of 22 May 2018 on key competences for lifelong learning, https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018H0604(01)#:~:text=The%20Reference%20Framework%20sets%20out,social%20and%20learning%20to%20learn

These skills are considered essential for the personal, social and economic development of individuals. They are also fundamental in preparing students for the world of work and adult life.

2.3.2 Digital Competences

In the DigComp framework[25] digital competence involves the "confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It is defined as a combination of knowledge, skills and attitudes." (Council Recommendation on Key Competences for Life- long Learning, 2018).

The DigComp framework identifies the key components of digital competence in 5 areas (Dimension 1). The areas are summarised below:

1. Information and data literacy: To articulate information needs, to locate and retrieve digital data, information and content. To judge the relevance of the source and its content. To store, manage, and organise digital data, information and content.
2. Communication and collaboration: To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity. To participate in society through public and private digital services and participatory citizenship. To manage one's digital presence, identity and reputation.
3. Digital content creation: To create and edit digital content To improve and integrate information and content into an existing body of knowledge while understanding how copyright and licences are to be applied. To know how to give understandable instructions for a computer system.
4. Safety: To protect devices, content, personal data and privacy in digital environments. To protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion. To be aware of the environmental impact of digital technologies and their use.
5. Problem solving: To identify needs and problems, and to resolve conceptual problems and problem situations in digital environments. To use digital tools to innovate processes and products. To keep up-to-date with the digital evolution.

---

[25] JRC, 2022, *DigComp 2.2 - The Digital Competence Framework for Citizens*

FIG.3   DigComp areas (Dimension 1)
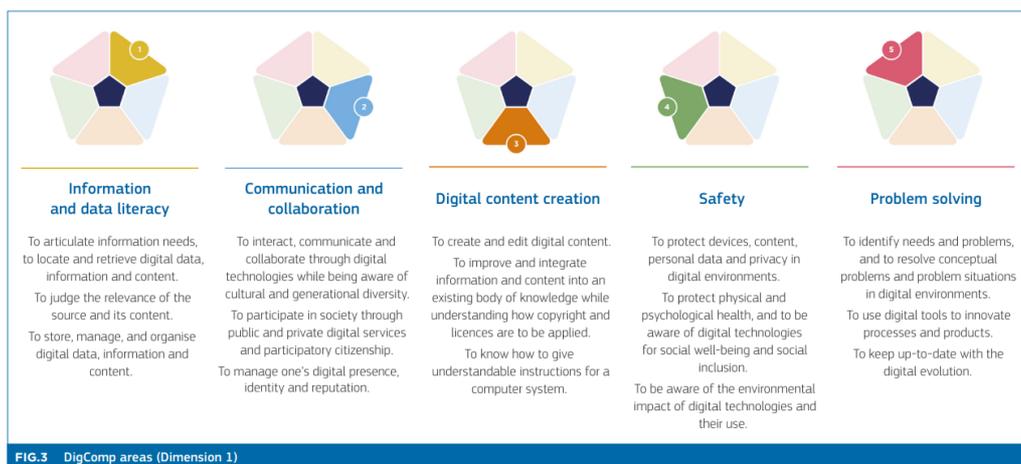
The #DigComp constitutes the set of knowledge that citizens must possess in order to "be able to enjoy a good quality of life, participate in democratic society and be competitive in the world of work" and is the guiding document that allows digital skills to fit into the eight key competences of lifelong learning.
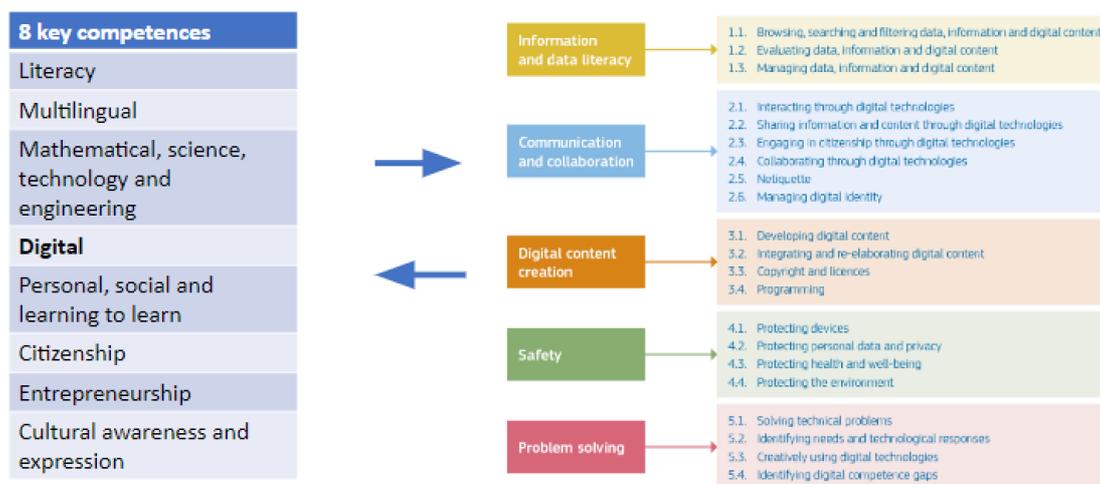
The design of effective smart lessons that develop students' competences must take both frameworks into account. It is important that smart lessons:

- Are designed to develop specific competences;
- Use digital technologies appropriately for competence development;
- Are consistent with the general educational objectives.

For example, a smart lesson that aims to develop critical thinking skills could use a simulation to allow students to experiment with different

solutions to a problem. A smart lesson that aims to develop communication skills could use a collaboration platform to allow students to work together on a project.

Starting with skills is a key element in designing effective smart lessons because it allows digital technologies to be used strategically to achieve specific educational objectives.

2.4 The Smart Lesson matrix: how to integrate the different set of competences

Digital technologies can be used to develop key competences in a prevalent way. For example:

- Problem-solving skills: simulations, games and open-ended problems can be used to allow students to experiment with different solutions to a problem.
- Critical thinking skills: research activities, discussion and evaluation of content can be used to develop students' critical thinking skills.
- Communication skills: collaboration platforms, videos and presentations can be used to enable students to communicate their ideas effectively.
- Digital skills: digital content creation activities, research and the use of digital technologies can be used to develop students' digital skills.

The following matrix was developed by the SMART project partners to classify some of the main digital applications and technologies used in education according to the prevailing digital competences they develop.

The matrix, which obviously does not include an exhaustive list of all available digital technologies, should be used when designing a smart lesson to choose the most appropriate technology for the development of a specific competence.

Information & data literacy	Communication & collaboration	Digital content creation	Safety	Problem solving
Moodle	Google Document	Socrative	Norton	Magnetometer
Livresq.com	TopWorkSheet	Quizizz	TotalAv	Smarty App
Schoology	Wordwall	TopWorksheets	McAfee	Phyphox
Edmodo	Nextcloud	Wordwall, WordPress	Interland	Smart Box
Microsoft Teams	Onlyoffice, Jitsi	Kahoot, Prezi		Google Spreadsheets
Graasp.eu	Quizizz, Drawpile	Edpuzzle, GIMP		Geogebra
Canvas	Pear Deck, Nearpod	Socrative, OpenShot		AIDE

Wikis	Zulip, Etherpad	H5P, Graasp.eu		Phet
Flipgrid	Flipgrid, ClassFlow, GoClass, Formative	Google Slides		

Chapter 3: How to develop a smart lesson

3.1 The Smart Lesson structure

3.1.1 Before the Smart Lesson

The Smart Lesson, as we have seen in the first chapters, is an extremely effective type of lesson, because it enables students to develop competences (knowledge, skills and attitudes) quickly, constructively and interactively, using digital tools.

However, the preparation of a Smart Lesson presents greater elements of complexity than a traditional lesson, because it must integrate technological factors into the complex plurality of pedagogical and relational factors.

To manage this increased complexity, the Smart Lesson project has developed **a Smart Lesson format:** a tool designed to structure and simplify all the dimensions and factors that need to be considered to best design a lesson which integrates digital technologies.

A first suggestion we would like to make to teachers is to take the time to fill out the format we are proposing here, which at first glance can be complex.

If correctly completed, following the indications given in this methodology, the preliminary didactic designing activity elaborated through this Format allows the lesson to be managed in an effective and pleasant manner, anticipating the questions and problems posed by the students and organising all the activities in the most effective way.

Devoting time to the punctual compilation of the Smart Lesson Format, moreover, means producing a "**replicable lesson**", a tool that other teachers can easily take up and use to replicate the same lesson.

Providing one's expertise and experience as a teacher to produce Smart Lesson Didactic Formats does not only mean developing an operational tool to effectively manage one's own lesson, but it also means contributing to the creation of **a database of Smart Lessons** that everyone can replicate, thus creating a **common heritage with which to improve the digital didactics of our schools.**

This chapter illustrates how to compile the Smart Lesson Format, and presents:

- in the first paragraph, the basic elements of the Format, its structure and purpose;

- in the second paragraph, the concrete and operational instructions to be followed for a correct completion of the Format, a step-by-step handbook for filling in each individual field;

- in the third paragraph, finally, the Didactic Format in its complete version, to be used to design Smart Lessons.
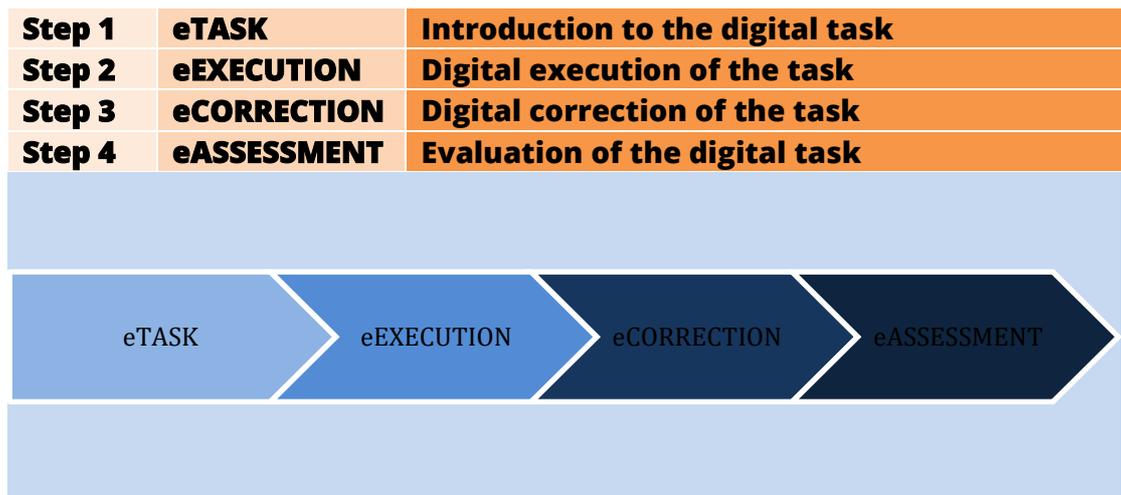
3.1.2 The 4 Areas of the Smart Lesson design.

In order to properly organise the plurality of technical, didactic and digital information and guidance required to run a Smart Lesson, the Smart Lesson didactic format has been structured into 4 Areas.

The **first Area is defined as "MAIN DATA OF THE LESSON"**. Within this area can be entered all the elements that constitute the identity of the digital lesson. These are organisational and structural data, fundamental information to enable the teacher who designed it and any other teacher to identify the lesson and, if they wish, to reproduce it.

The **second Area of the Format is defined as "LEARNING OUTCOMES".** In this Area the objectives expected to be achieved through the Smart Lesson are codified. It specifically defines the technical, digital and life-long learning competences that the lesson should help to enhance.

The third Area is called 'DIGITAL TOOLS/APPS'. It is the fundamental area of the Format because it describes briefly but precisely the apps you intend to use and the related skills you intend to develop with the specific apps.

Finally, the **fourth area of the Format is called "DESIGN OF THE SMART LESSON IN 4 STEPS"**. Within this area, the activities to be carried out during the lesson are planned. According to the Smart Lesson methodology, the activities should be structured in 4 steps:

Step 1	eTASK	Introduction to the digital task
Step 2	eEXECUTION	Digital execution of the task
Step 3	eCORRECTION	Digital correction of the task
Step 4	eASSESSMENT	Evaluation of the digital task

eTASK → eEXECUTION → eCORRECTION → eASSESSMENT

3.2 Develop a Smart Lesson step by step

3.2.1 How to fill in AREA 1: MAIN DATA

The area contains the identity elements of the lesson to be designed. This is organisational and structural information that allows the teacher to define the basic characteristics of the lesson, enabling other teachers to identify it clearly and quickly. This area consists of 6 fields:

Didactic Format – Area 1

MAIN DATA OF THE LESSON	
Title:	*(Title of the Smart Lesson)*
Subject:	*(School subject, i.e.: Italian, mathematics, history, science, ...*
Main target:	☐ *Grade 1 (primary school)* ☐ *Grade 2 (lower secondary school)* ☐ *Grade 3 (upper secondary school)*
Duration:	
Context:	☐ *Inside the classroom* ☐ *Outside the classroom*
School/Author:	*(Name, Surname, Role, School, Mail)*

1. **TITLE**

   The lesson title is the central element of this area. The title is an important element because it helps to identify the main content of the lesson as well as the message the lesson is intended to convey. The title is important both for the teacher designing the lesson, who can in this way communicate more effectively the main content of the lesson, as well as for the other teachers, who can in this way identify it and assess the possibility of deepening it and, possibly, replicating it. To be effective, the title must be simple, direct, immediate and, if possible, original.

2. **SUBJECT**

Within this field, the subject within which the lesson is to be proposed must be clearly identified. This information allows for the digital cataloguing and archiving of lessons, making them available to teachers and thus constituting a common and easily accessible heritage.

3. **MAIN TARGET**
Within this field, the recipients of the lesson must be clearly identified, specifying whether the lesson is aimed at 'primary school', 'lower secondary school' 'upper secondary school'. This information also enables classification and thus widespread use of the lessons.

4. **DURATION**
In this field the approximate duration of the lesson must be specified. There may be Smart Lessons lasting 1 hour or 2 hours, but there may also be longer Smart Lessons, e.g. lasting 4 or 6 hours, which must therefore be planned over a longer time frame.

5. **CONTEXT**
The Smart Lesson can be implemented entirely in the classroom, or it can be designed to be implemented outside the classroom. Of course, it is also possible to have Smart Lessons that take place partly in the classroom and partly outside the classroom. In the latter case, as will be seen more clearly below, the out-of-class activity can be carried out outdoors with the participation of the whole class or it can be realised by the students at home, either individually or in groups. In this field, it is therefore necessary to indicate whether the Smart Lesson to be proposed can be carried out inside the classroom, outside the classroom or in both contexts.

6. **AUTHOR**
Information about the teacher who designed the Smart Lesson must be entered in this field. The information requested is: the first and last name of the teacher, the subject taught and the reference school. You are also required to enter - if you wish - your work email address in order to facilitate any contacts and exchanges of experience between teachers.

3.2.2 How to fill in Area 2 – Learning Outcomes

The "LEARNING OUTCOMES" area makes it possible to structure the Smart Lesson objective system with the awareness that every digital lesson has the task of enhancing and having an impact on the students' technical skills, but also on digital (being within a digital lesson) and transversal skills, related to Lifelong Learning.

This area consists of the following 3 fields:

Didactic Format – Area 2

LEARNING OUTCOMES	
Specificy the technical competences, digital and life long learning competences which will be developed	
Technical Competences:	*Specific competences related to the subject*
Digital Competences:	*According to the DigiComp:* ○ *Information & data literacy* ○ *Communication & collaboration* ○ *Digital content creation* ○ *Safety* ○ *Problem Solving*
Key Competences:	*According to 8 Eu Life long learning Competences*:* ○ *Literacy* ○ *Multilingual* ○ *Mathematical, science, technology and engineering* ○ *Personal, social and learning to learn* ○ *Citizenship* ○ *Entrepreneurship* ○ *Cultural awareness and expression* **The digital competence is not listed below as it is already included in the previous point*

1. **TECHNICAL COMPETENCES**
   Within this field, the learning objectives of the lesson are described in relation to the specific content of the subject being addressed. If the Smart Lesson is on History, the objective may be to learn about the life of Napoleon, rather than about World War II; if the Smart Lesson is on mathematics, the objective may be to learn how to make equations, expressions or other.

2. **DIGITAL COMPETENCES**
   This field envisages defining the digital objectives of the Smart Lesson using as a reference the digital competences framework defined by DigComp 2.0 (cf. Digital Competences Framework - DigComp 2.2). Within this field, you must therefore select from the 5 Areas defined by DigComp 2.2 the one that the lesson wishes to enhance using the following classification as a methodological reference:

FIG.1   The DigComp conceptual reference model

3. KEY COMPETENCES

The Key Competence field allows you to define the key or transversal objectives of the Smart Lesson as outlined in the European Council Recommendation of 22 May 2018 on key competences for lifelong learning - 2018/C 189/01.

Below are the main contents of the 8 key lifelong learning competences:

1. **Literacy** is the ability to identify, understand, express, create and interpret concepts, feelings, facts and opinions in both oral and written forms, using visual, sound/audio and digital materials across disciplines and contexts. It implies the ability to communicate and connect effectively with others, in an appropriate and creative way.

2. **Multilingual competence** defines the ability to use different languages appropriately and effectively for communication. It broadly shares the main skill dimensions of literacy: it is based on the ability to understand, express and interpret concepts, thoughts, feelings, facts and opinions in both oral and written

form (listening, speaking, reading and writing) in an appropriate range of societal and cultural contexts according to one's wants or needs.

3. **Mathematical competence and competence in science,technology and engineering** is the ability to develop and apply mathematical thinking and insight in order to solve a range of problems in everyday situations. Building on a sound mastery of numeracy, the emphasis is on process and activity, as well as knowledge. Competence in science refers to the ability and willingness to explain the natural world by making use of the body of knowledge and methodology employed, including observation and experimentation, in order to identify questions and to draw evidence-based conclusions. Competences in technology and engineering are applications of that knowledge and methodology in response to perceived human wants or needs. Competence in science, technology and engineering involves an understanding of the changes caused by human activity and responsibility as an individual citizen.

4. **Digital competence** involves the confident, critical and responsible use of, and engagement with, digital technologies for learning, at work, and for participation in society. It includes information and data literacy, communication and collaboration, media literacy, digital content creation (including programming), safety (including digital well-being and competences related to cybersecurity), intellectual property related questions, problem solving and critical thinking.

5. **Personal, social and learning to learn competence** is the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient and manage one's own learning and career. It includes the ability to cope with uncertainty and complexity, learn to learn, support one's physical and emotional well-being, to maintain physical and mental health, and to be able to lead a health-conscious, future-oriented life, empathize and manage conflict in an inclusive and supportive context.

6. **Citizenship competence** is the ability to act as responsible citizens and to fully participate in civic and social life, based on understanding of social, economic, legal and political concepts

and structures, as well as global developments and sustainability.

7. **Entrepreneurship competence** refers to the capacity to act upon opportunities and ideas, and to transform them into values for others. It is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance and the ability to work collaboratively in order to plan and manage projects that are of cultural, social or financial value.

8. **Cultural awareness and expression competence** involves having an understanding of and respect for how ideas and meaning are creatively expressed and communicated in different cultures and through a range of arts and other cultural forms. It involves being engaged in understanding, developing and expressing one's own ideas and sense of place or role in society in a variety of ways and contexts.

3.2.3 How to fill in Area 3 – Digital Tools

Considering the nature of the Smart Lesson, the "Digital Tools/Apps" area is the most relevant within the Format.

In this area - consisting of a single field - it is possible to indicate the Apps that you intend to use during the lesson.

Didactic Format – Area 3	
DIGITAL TOOLS/APPS	
APPs and other IT tools	*Brief description of the apps and of the skills/competences that are developed through the apps*

For each App, it is then useful to include a brief description of its functionalities and the link with the digital competences it enables to develop.

To facilitate the compilation of this field, the Smart Lesson project has developed a methodological scheme that classifies the Apps within the 5 Areas identified by DigComp 2.2. The scheme makes it possible to link each APP with the specific digital competence it can develop.

The Moodle platform developed within the project shows the functionalities of all classified apps.

Classification of the Apps (Smart Lesson, 2024)

Information & data literacy	Communication & collaboration	Digital content creation	Safety	Problem solving
Moodle	Google Documents	Socrative	Norton	Magnetometer
Livresq.com	TopWorksheets	Quizizz	TotalAV	Smarty App
Schoology	Wordwall	TopWorksheets	McAfee	Phyphox
Edmodo	Nextcloud	Wordwall, WordPress	Interland	Smart Box
Microsoft Teams	ONLYOFFICE, Jitsi	Kahoot, Prezi		Google Spreadsheets
Graasp.eu	Quizizz, Drawpile	Edpuzzle, GIMP		Geogebra
Canvas	Pear Deck, Nearpod	Socrative, OpenShot		AIDE
Wikis	Zulip, Etherpad	H5P, Graasp.eu		Phet
Flipgrid	Flipgrid, ClassFlow, GoClass, Formative	Google Slides		

3.2.4 How to fill in Area 4 – Design of the Smart Lesson

The fourth area - called "DESIGN OF THE SMART LESSON IN 4 STEPS" - is the most operational and concrete part of the Format, the one in which the activities that will be carried out in the Smart Lesson are precisely indicated. The format envisages dividing the lesson - ideally - into four steps: in the first step (eTask), the lesson is introduced; in the second step (eExecution), the students carry out an activity, an exercise or a task with the support of digital tools; in the third step (eCorrection), the lesson is corrected, generally with the support of digital tools; finally, in the fourth step (eAssessment), the learning achieved during the lesson is evaluated. This fourth area requires the completion of four fields:

1. STEP 1 - eTASK

The Step 1 - eTASK field should describe how the lesson is to be introduced to the students. This Step must be brief, but at the same time clear and precise, to enable the structure, strategy, working methods and objectives to be shared with the students.

Here, the operational indications (e.g. the teacher's presentation, the activities to be carried out, any slides, group activities, ...) that characterise the lesson must be provided.

In particular, three types of content must be described:

a. <u>The theme of the lesson</u>

   i. It is necessary to provide a brief introduction in which the theme to be addressed in the lesson is presented. It is useful to specifiy:

      (i) the main topic that will be addressed during the lesson;

      (ii) the main references (texts, sites, materials,etc.) that can be used to introduce the lesson;

      (iii) the ways to explain the contents (teacher's intervention, presentation of slides, watching a video, ...)

b. <u>Presentation of Learning Outcomes</u>

   i. It is necessary to explain in a simple but precise manner the objectives that the Smart Lesson intends to achieve. In particular, it is important to specify that the Smart Lesson does not only include the development of technical competences (see Area 2, point 1), but - thanks to the support of the digital tool - also digital competences (see Area 2, point 2) and key competences (see Area 2, point 3).

c. <u>Presentation of the Smart Lesson Activities</u>.

   In this introductory phase, it is then useful to explain the activities that will be carried out during the lesson:

   (i) Specifying that the Smart Lesson is organised in four steps (eTask, eExecution, eCorrection, eAssessment);

   (ii) Presenting the digital tools (Apps) that will be used and the characteristics of these tools;

(iii) Verifying the usability/access of the digital tools (Apps) by the students.

2. STEP 2 - eExecution

The Step 2 - eExectution field allows to describe the specific activities that the teacher intends to propose to the students.

In this field, specific indications must be given as to how the exercise and/or activity is to be carried out, also with the support of technological tool(s).

Didactic Format – Area 4 – Step 2

DESIGN OF FHE SMART LESSON IN 4 STEPS	
Step 2 – eEXECUTION Digital execution of the task	*(Execution of the task, description of the tasks/subtasks that will be carried out with the help of the apps/digital technology)* o **Individual Research and Learning**: *Students use the educational resource app to learn about a specific topic and take notes.* o **Task Organization**: *Using the project management tool, students plan and organize their learning activities and timelines.* o **At-Home Execution:** *Encourage students to engage in these tasks at home, promoting a comfortable and self-paced learning environment.*

It is useful to clarify:
(i) The type of the activity (could be an exercise, a game, a challenge, ...);
(ii) The technological tool (App or other) that will be used to carry out the activity;
(iii) The functionalities of the digital tool that will be used;
(iv) The operational and basic indications on the use of the digital tool in the classroom or in a different context.

3. STEP 3 - eCorrection

The Step 3 - eCorrection field provides for the shared, digital correction of the exercise or task performed during Step 2.

Didactic Format – Area 4 – Step 3

DESIGN OF FHE SMART LESSON IN 4 STEPS	
Step 3 – eCORRECTION Digital correction of the task	*(Describe the different options: self-correction, digital correction with the teacher and with the classroom)* o **Self-Correction**: *Students use digital tools (like grammar checkers or fact-checking websites) to review their work.* o **Teacher Feedback**: *Teachers provide feedback digitally, focusing on content comprehension and digital skill application.* o **Classroom Interaction**: *Incorporate opportunities for students to share their work with peers digitally, encouraging collaborative learning and peer a* WhatsApp

In this area, it is useful to explain how to carry out the correction of the assignment.

The teacher can, in particular, propose one or more of the following correction modes:

(i) Self-correction: it is possible to describe in the Format how to manage self-correction of the activity using the Apps;

(ii) Teacher feedback: it is possible to describe in the Format the ways of making corrections to the exercise in a dialogue between the teacher and the students;

(iii) Classroom Interaction: it is possible to describe in the Format how to share the corrections of the exercise between the students with the support of a digital tool.

4. STEP 4 - eAssessment

The Step 4 - eAssessment field contains methodogical and operational indications on how to perform the assessment.

Didactic Format – Area 4 – Step 4

DESIGN OF FHE SMART LESSON IN 4 STEPS

Step 4 – eASSESSMENT
Evaluation of the digital task

(describe how to measure the achievement of the learning outcomes, evaluate the lesson with regard to the 3 different learning outcomes, optimize the lesson)
- **Measuring Learning Outcomes**: *assess if the 3 different types of competences (technical, digital, life long learning have been achieved)*
- **Evaluating Lesson Effectiveness**: *assess how effectively the lesson facilitated and improved the learning experience of students.*
- **Optimization for Future Lessons**: *Gather student feedback to refine and enhance future digital lessons.*

The evaluation, in particular, must consider the following aspects:

i. Evaluation of Learning Outcomes: The Format describes how the technical, digital and lifelong learning objectives of the lesson are evaluated. To develop an operational evaluation, this field can be filled in by using the Smart Evaluation Meter tool provided by the project.

ii. The Evaluation of Effectiveness: The Format describes the basic points and questions to be addressed in order to evaluate the lesson's ability to achieve its objectives, e.g.: Was the introduction clear? Was the digital tool user-friendly? Did the way the content was shared facilitate learning? and others.

iii. Optimisation for Future Lessons: questions to gather suggestions or tips for improving the lesson. It is possible to ask e.g.: Do you think a different digital tool could have been used for this lesson? Which one? Could the group activities have been done differently? How? What suggestions would you give to improve the smart lesson?

3.3 The Smart Lesson Template

Smart Lesson Template

MAIN DATA OF THE LESSON	
Title:	*(Title of the Smart Lesson)*
Subject:	*(School subject, i.e.: Italian, mathematics, history, science, …*
Main target:	€ *Grade 1 (primary school)* € *Grade 2 (lower secondary school)* € *Grade 3 (upper secondary school)*
Duration:	
Context:	€ *Inside the classroom* € *Outside the classroom*
School/Author:	*(Name, Surname, Role, School)*

LEARNING OUTCOMES	
Specificy the technical competences, digital and life long learning competences which will be developed	
Technical Competences:	*Specific competences related to the subject*

Digital Competences:	*According to the DigiComp:*
	  o *Information & data literacy*
	  o *Communication & collaboration*
	  o *Digital content creation*
	  o *Safety*
	  o *Problem Solving*

Key Competences:	*According to 8 Eu Life long learning Competences*:*
	  o *Literacy*
	  o *Multilingual*
	  o *Mathematical, science, technology and engineering*
	  o *Personal, social and learning to learn*
	  o *Citizenship*
	  o *Entrepreneurship*
	  o *Cultural awareness and expression*
	*The digital competence is not listed below as it is already included in the previous point

DIGITAL TOOLS/APPS	
APPs and other IT tools	*Brief description of the apps and of the skills/competences that are developed through the apps*

DESIGN OF FHE SMART LESSON IN 4 STEPS

Step 1 – eTASK **Introduction to the digital task**	*(Introduction to the topic, explanation of the different learning outcomes, general introduction to the activities to be carried out: this is a brief introduction to present the topic and the activities to the students)* ○ ***Topic Introduction****: A brief introduction to the subject matter, emphasizing the importance of digital skills.* ○ ***Learning Outcomes Explanation****: Explain how using these apps will contribute to achieving the specified learning outcomes.* ○ ***Activity Overview:*** *Outline the main activities, including research, organization, and assessment tasks.*
Step 2 – eEXECUTION **Digital execution of the task**	*(Execution of the task, description of the tasks/subtasks that will be carried out with the help of the apps/digital technology)* ○ ***Individual Research and Learning****: Students use the educational resource app to learn about a specific topic and take notes.* ○ ***Task Organization****: Using the project management tool, students plan and organize their learning activities and timelines.* ○ ***At-Home Execution:*** *Encourage students to engage in these tasks at home, promoting a comfortable and self-paced learning environment.*
Step 3 – eCORRECTION **Digital correction of the task**	*(Describe the different options: self-correction, digital correction with the teacher and with the classroom)* ○ ***Self-Correction****: Students use digital tools (like grammar checkers or fact-checking websites) to review their work.* ○ ***Teacher Feedback****: Teachers provide feedback digitally, focusing on content comprehension and digital skill application.* ○ ***Classroom Interaction****: Incorporate opportunities for students to share their work with peers digitally, encouraging collaborative learning and peer assessment)*
Step 4 – eASSESSMENT **Evaluation of the digital task**	*(describe how to measure the achievement of the learning outcomes, evaluate the lesson with regard to the 3 different learning outcomes, optimize the lesson)* ○ ***Measuring Learning Outcomes****: assess if the 3 different types of competences (technical, digital, life long learning have been achieved)* ○ ***Evaluating Lesson Effectiveness****: assess how effectively the lesson facilitated and improved the learning experience of students.* ○ ***Optimization for Future Lessons****: Gather student feedback to refine and enhance future digital lessons.*