Digital Manual for primary school principals in online and inclusive education leadership

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En este libro puede volver al índice
pulsando el pie de la página

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Table of Contents

Introduction

This digital manual is a **guidance material** made available as an open educational resource. It serves the purpose of training, as well as motivating teaching experience f**or the support of online and inclusive education.**

The result has been developed with the intention to support primary school **principals in** online and inclusive education **leadership.**

However, a wider audience will benefit from the digital manual. Also training providers, teachers and educators that are using digital infrastructure, resources or tools in education; are or will be involved in digital leadership; are interested in digital pedagogy for the support of lifelong learning opportunities. Academic institutions responsible for primary school educators and the students, future teachers or education leaders.

The digital manual will give the target audience, on an international level, a tool of good use for their relevant research and every day functional educational needs.

To better understand the purpose of the manual **key definitions** and integration guidelines have been prepared. The former at the beginning of the manual, the latter towards the end.

The manual has been divided into a few chapters.

In the subsequent chapter key definitions have been explained, explicitly, what **inclusive education** means, how **digital leadership** should be understood and why **open educational resources**.

Afterwards the manual consists of four learning units, each of them including Teaching & Learning (T&L) content and quiz questions. The topics of learning units (LU) are: inclusive digital learning (LU1), promoting digital intelligence in the primary school community (LU2), digital learning leadership for primary school community (LU3), and accessing and maintaining digital infrastructure for all.

Another chapter is devoted to **integration guidelines**, recommendations for principles on using the manual in online and offline educational contexts. The manual ends with the bibliography and additional sources - those related to the topics, areas and themes that have been addressed herein, and that can be useful for further research.

Continue to the next chapter of the Digital Manual for primary school principals in online and inclusive education leadership.

Key definitions

INCLUSIVE EDUCATION

Worldwide, there are 240 million children with various disabilities. As any other child, they require appropriate education in order to enhance their capabilities and achieve their full potential. However, the lack of consideration for children with diverse disabilities (as well as young speakers of minority languages) during the policymaking process is recognised as a significant factor impending their educational opportunities and social participation. Inclusive education refers to the practise of assigning all students, irrespective of any difficulties that they face, to general education classrooms suitable for their age to obtain proper education and assistance allowing them to meet the requirements of the core curriculum. In other words, inclusive education is the way to provide equal educational opportunities for all students, enabling them to attend school, acquire knowledge, and develop the necessary skills for their process of maturation and the future success. Effective inclusive education is achieved by embracing, comprehending, and conforming to the physical, cognitive, academic, social, and emotional differences of students. Inclusive systems highly regard the various inputs that students from a variety of backgrounds bring to the class. Those contributions foster students' collaboration, enabling them to acquire valuable experience and develop their social skills. Nonetheless, advancements are made at a gradual pace. Implementing inclusive systems involves extensive changes at all levels of society. At school level, it is crucial to provide training for teachers, renovate school buildings, and ensure that every student has an access to learning resources that are easily accessible. At the community level, not only must discrimination be eradicated, but also it is necessary to educate people about the advantages of inclusive education. At the national level, governments should adapt the proper provisions (based on the Convention on the Rights of Persons with Disabilities) and analyse data on a regular basis to ascertain that children are provided with efficient services.

DIGITAL LEADERSHIP

Digtal leadership is a term given to all individuals who perform leadership duties and activities through electronic channels. Digital leadership refers to the act of applying social influence by using technology for the purpose of provoking a transformation in attitudes, emotions, cognition, behaviour, and performance of people, groups, or organisations, with the aim of guiding them towards the accomplishment of a certain objective. In this instance, information technology is used for communication and information dissemination. Leadership in companies is typically relied on direct, in-person interactions. Presently, organisations are integrating technology into their operations, leading to a demand for digital leadership. This approach encompasses technological components which might involve videoconferencing, online collaboration software, cell phones, e-mail or Wi-Fi. Digital leadership may include the same structure and strategy as conventional in-person leadership, particularly in the context of technological progress that increasingly facilitates virtual interactions. Creating opportunities for greater individual engagement in decision-making is the essence of participative leadership. On top of that, digital leadership may be very inspirational. In order to accomplish this purpose, e-leaders may employ electronic correspondence as a means of expressing inspiring visions, delight over new projects, or satisfaction in the outcomes of their followers. Analysing another constantly changing environment, such as education, it is evident that the need for di leadership is significantly rising. The current leadership model in education became gradually outdated during the Covid-19 pandemic, when all stakeholders, including parents and students, were exposed to the use of technology and online learning platforms. Leaders felt obliged to adopt the growing trend and develop e-leadership skills to support the employees and handle the shifting demands of consumers (particularly students and their parents). Rapidly, all educational leaders embraced innovative communication and collaboration technology, in conjunction with e-learning platforms.

OER

OER stands for Open Educational Resources – which refers to widely accessible materials used for educational purposes and the process of learning. OER, in contrast to conventional copyrighted resources, are developed or authored by an organisation or individual that provides permission for the reuse and customization of their work. The objective is to provide general access to information and different sources that are relevant in the educational means, consequently reducing the risk of digital exclusion. Open Educational Resources may consist of a number of materials, including: handbooks, lesson plans, presentations, tutorials, games, tests, multimedia and other learning tools or resources. Importantly, the first international regulatory document to address the subject of publicly licenced educational resources and technology in the area of education is the **Recommendation on Open Educational Resources**, which was accepted by UNESCO's General Conference during its 40th session on November 25,2019.

BIBLIOGRAPHY

The following are sources used for the preparation of the key definitions' chapter.

UNICEF. (2022). Inclusive education. UNICEF https://social.desa.un.org/issues/disability/crpd/convention-on-the-rights-of-persons-with-disabilities-crpd

McManis, L.D. (2017,November 20). Inclusive Education: Definition, Examples, and Classroom Strategies | Resilient Educator. ResilientEducator.com https://resilienteducator.com/classroom-resources/inclusive-education/.

Bouassaba, N. (n.d.). Council Post: The Rise Of E-Leadership And What Can Be Learned From It. Forbes. Retrieved January 31, 2024, from https://www.forbes.com/sites/forbescoachescouncil/2022/12/27/the-rise-of-e-leadership-and-what-can-be-learned-from-it/?sh=18c3bb7b7abf.

Peignen, C. (n.d.). Subject & Study Guides: Open Educational Resources (OER): What are OER? Ait.libguides.com. https://ait.libguides.com/openeducation.

Open Access educational resources - The Cracow University of Technology Library. (n.d.). Www.biblos.pk.edu.pl. Retrieved January 31, 2024, from https://www.biblos.pk.edu.pl/en/open-science/open-access-educational-resources.

UNESCO. (n.d.). Open Educational Resources | UNESCO. Www.unesco.org. https://www.unesco.org/en/open-educational-resources.

What Is a Digital Flipbook? All You Need To Know In 2020. (n.d.). 3D Issue Knowledge Base. https://www.3dissue.com/help/knowledge-base/flipbooks/what-are-digital-flipbooks/.

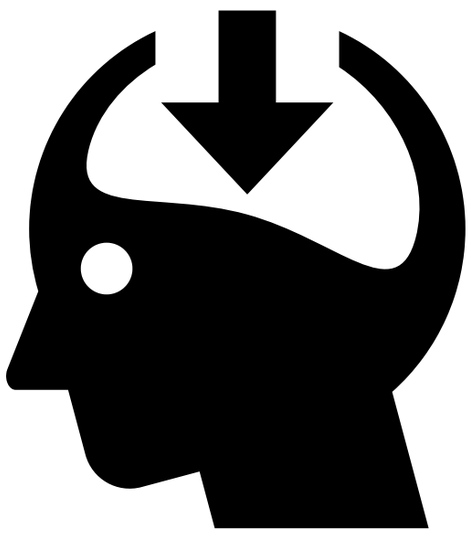
Learning Unit 1

Inclusive Digital Learning

Laura Landi & Rita Bertozzi

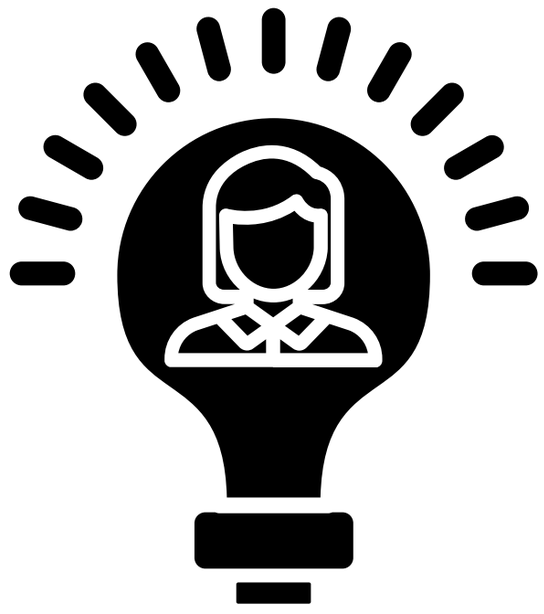
Content I

Introduction: Learning Objectives



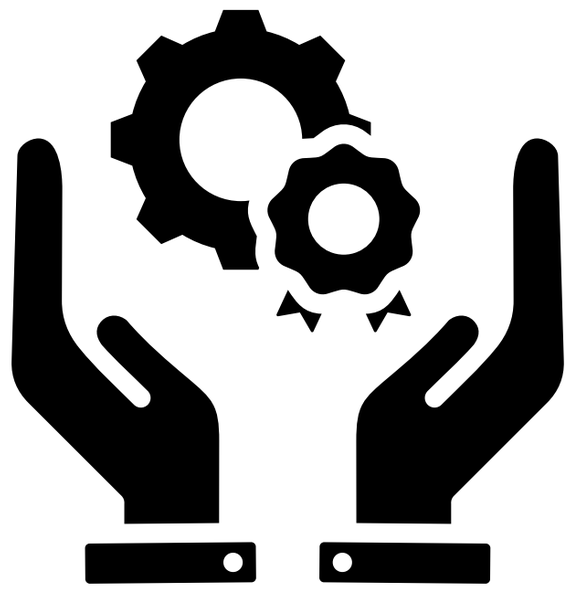
To know...

- how to select the digital tools that support the full diversity of beneficiaries, including vulnerable students (Universal Design for learning framework)
- the potential and the limits of digital technology as a means to improve effective and inclusve learning in primary school.



To understand...

- how to assess and choose the most motivational, and user-friendly digital tools for the adaptation of the courses to the digital environment, also taking into account the special cultural needs of the school community.
- how to encourage the participation of families from vulnerable and/or culturally-diverse contexts.



To be able to...

- ensure equal participation of all students in the digital education process, empowering the teaching staff to develop a culture of digital inclusiveness within the school community .
- implement real-time, meaningful assessments enabled by technology—whether graded, non-graded, in—class activities, or student self-assessments.

Content II

Inclusive education

VULNERABILITY

The possibility that a group of people will be excluded based on discriminatory grounds: gender, remoteness, wealth, disability, ethnicity, language, migration, displacement, incarceration, sexual orientation, gender identity and expression, religion and other beliefs and attitudes (UNESCO, 2020, p. 4).
An individual can experience exclusion in different ways.

INTERSECTIONALITY

Means ‘that a person, group of people, organisation or social problem is affected and impacted upon by a number of pressures, forces, levers, discriminations and disadvantages’ (European Agency, 2021b, p. 6).
Successful inclusion in education must therefore consider learners’ experiences of inclusion or exclusion not only in the teaching-learning situation, but in terms of influences from organisational, interpersonal and societal levels.

UNESCO. 2020. Global Education Monitoring Report 2020: Inclusion and education: All means all. Paris, UNESCO.

INCLUSION

- ‘A process consisting of actions and practices that embrace diversity and build a sense of belonging, rooted in the belief that every person has value and potential and should be respected’ (UNESCO, 2020, p. 419).
- Inclusion implies a comprehensive perception and appreciation of diversity within a less sharply defined community.
- Inclusion does not focus on a specific ‘target group’, rather it applies a learner-focused principle, granting quality education to all learners.
- Inclusion is understood as a theoretical construct in the sense of a desirable goal to be reached, rather than as a current societal reality. (source, AGENDA 2030)

It may firstly be useful to focus on individuals or groups who are particularly vulnerable to exclusion by a system to guide the design of inclusive conditions in the education system

Inclusive-education-in-action website

UNESCO (2009)
Policy Guidelines on Inclusion in Education. UNESCO, Paris

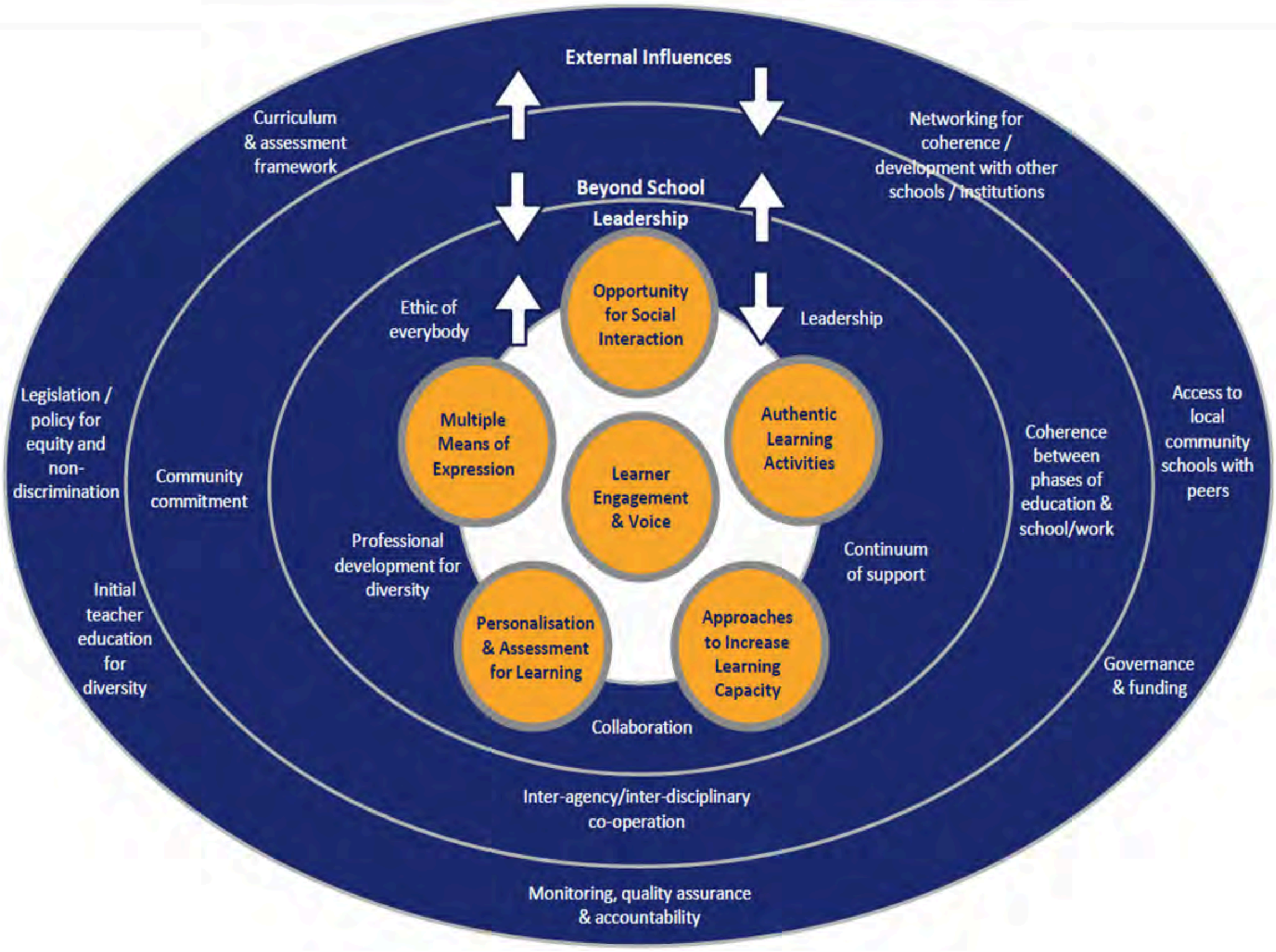
SEN - Special Educational Needs

Art. 24-Edication- United Nation Convention on the Rights of Persons with Disabilities (2006) (UNCRPD)

EQUITY

Defining equity, the Commission of the European Communities (2006) states that it is: ‘… viewed as the extent to which individuals can take advantage of education and training, in terms of opportunities, access, treatment and outcomes’ (p. 2). The OECD (2007) links equity to fairness and states that personal and social circumstances should not be an obstacle to achieving educational potential.

INCLUSIVE EDUCATION



Ecosystem of Inclusive Education Model (adapted from European Agency, 2017b, p.11)

The original model was designed to provide a holistic overview of the complex networks in the environment that affect every learner. In the model, all the levels interact with and influence each other.

See **Unit 3** for more info

UNESCO (1994) Salamanca Statement regarding inclusive education: Regular schools with this inclusive orientation are the most effective means of combating discriminatory attitudes, creating welcoming communities, building an inclusive society and achieving education for all; moreover, they provide an effective education to the majority of children and improve the efficiency and ultimately the cost-effectiveness of the entire education system (p8).

UNESCO (1994) World Conference on Special Needs Education: Access and Quality, Salamanca, Spain, 1994

READ MORE

European Agency for Special Needs and Inclusive Education, 2019. Inclusive School Leadership: Exploring Policies Across Europe. (E. Óskarsdóttir, V. Donnelly and M. Turner-Cmuchal, eds.). Odense, Denmark

THE CURRICULUM

The current use of the term ‘inclusion’ starts from the proposition that pupils with SEN have a right to a curriculum that is appropriate to their needs and that education systems have a duty to provide this. The curriculum is not fixed, but something to be developed until it is appropriate for all pupils. A flexible curriculum is beneficial to all students, because it takes into account personal interests and learning styles, broaden learning horizons and can promote common understanding.

Alongside these ideas are these key propositions:

- A curriculum for all considers academic and social learning. Curriculum goals and implementation should reflect this dual focus;
- Inclusion is a process and not a state. Educators will always need to move their work forward to enable the learning and participation of all pupils.

TEACHERS' CHARACTERISTICS AND SKILLS

All teachers should have positive attitudes towards all learners; they need experiences that will develop positive attitudes and values and encourage them to research, reflect and find innovative solutions to new challenges presented by learner difference. In particular, teachers should welcome support from colleagues with different areas of expertise and work co-operatively moving from an individual to a collective approach to their work.

All teachers should develop the skills, knowledge and understanding to meet the diverse needs of all learners:

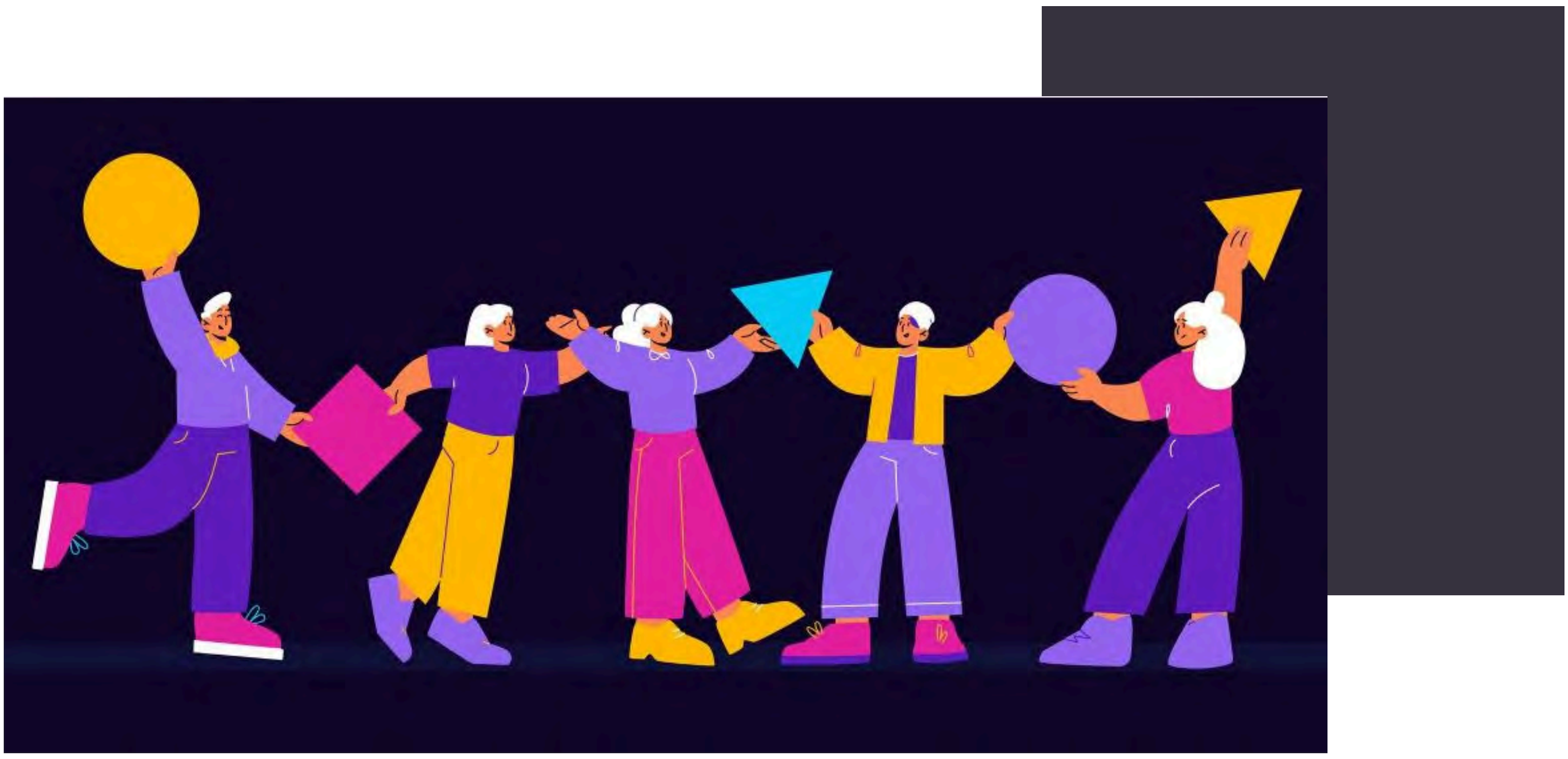
- provide a range of learning opportunities with choice for all learners, in line with a view of intelligence as multi-dimensional;
- use a range of approaches to teaching, using flexible groups and taking account of learners' preferences;
- plan a relevant curriculum that provides coherent opportunities for the development of core, cross curricular competencies and meaningful engagement for all learners; and
- work with colleagues to develop individual plans to ensure the consistent deployment of any necessary support, aids and adaptations to meet learners' needs.

Resources from the Teacher Professional Learning for Inclusion project

three-page infographic - Teacher Professional Learning for Inclusion

SCHOOL LEADERS FOR INCLUSIVE SCHOOL SHOULD:

- Establish a positive ethos and a learning culture by making their vision and inclusive values and beliefs explicit, ensuring that inclusion and learner well-being are central to all policies and evident in all practice;
- Organise school in ways that avoid labelling or categorising learners, e.g. flexible, mixed groupings for different activities;
- Actively work to promote responses to difference that include learners by extending what is available in their usual learning environment;
- Encourage and empower staff to develop their capacity and competence to meet a diversity of needs through different approaches and contribute their expertise to the whole school learning community;
- Support staff to reflect on their practice and become autonomous life-long learners;
- Manage resources effectively and ensure that they reflect and respect the diversity of learners within the school;
- Develop effective monitoring, self-review and learner-centred evaluation to inform planning and strategic improvement to develop the school's capacity to support the best possible progress for all learners;
- Manage specialist staff and internal and external networks to take joint responsibility and to work in partnership to facilitate access to the curriculum and extracurricular activities for all learners; and
- Communicate effectively with the local community, interdisciplinary support services and specialist settings to ensure a holistic and coordinated approach to learners and their families that recognises the importance of meeting broader needs to enhance learning.



Content III

Universal design for learning

‘Design of products, environments, programmes and services to be usable by all to the greatest extent possible, with no need for adaptation or specialised design’ (UNESCO, 2020, p. 420).

This design for all/universal design mindset is the aspirational standard in a preventive approach. The aim should be to implement educational settings that are built for all learners. This understanding of prevention is fully in line with the concept of **Prevention-Intervention-Compensation** policy approaches, set out in the Council Recommendation Inclusive Digital Education on policies to reduce early school leaving (Council of the European Union, 2011). The Agency then extended this concept to the field of inclusive education. The goals of inclusive education are most effectively met when policy and practice:

- ‘prevent different forms of educational exclusion before they happen’;
- ‘intervene to ensure that good quality inclusive education’ is always available for all learners;
- ‘compensate with specific actions and provision when prevention and intervention are not enough’ to adequately meet learners’ needs in inclusive settings (European Agency, 2018, p. 18).

Remove barriers to learning , while providing a challenging environment for all (Source www.disabili.com)

Universal Design for Learning
presentation by cast

HOW TO APPLY UNIVERSAL DESIGN/ DESIGN FOR ALL PRINCIPLES TO SCHOOL?

Universal Design for Learning (UDL) is a framework to improve and optimize teaching and learning for all people based on scientific insights into how humans learn.

UNIVERSAL DESIGN FOR LEARNING GUIDELINES

ENGAGEMENT

Learners differ markedly in the ways in which they can be engaged or motivated to learn. There are a variety of sources that can influence individual variation in affect including neurology, culture, personal relevance, subjectivity, and background knowledge, along with a variety of other factors. Some learners are highly engaged by spontaneity and novelty while others are disengaged, even frightened, by those aspects, preferring strict routine. Some learners might like to work alone, while others prefer to work with their peers. Providing multiple options for engagement is essential.

1

GUIDELINE 7 - Recruiting Interest

Spark excitement and curiosity for learning

CLICK HERE

2

GUIDELINE 8 - Sustaining Effort & Persistence

Tackle challenges with focus and determination

CLICK HERE

3

GUIDELINE 9 - Self Regulation

Harness the power of emotions and motivation in learning

CLICK HERE

REPRESENTATION

Learners differ in the ways that they perceive and comprehend information that is presented to them. For example, those with sensory disabilities (e.g., blindness or deafness); language or cultural differences, and so forth may all require different ways of approaching content. Others may simply grasp information quicker or more efficiently through visual or auditory means rather than printed text. Also learning, and transfer of learning, occurs when multiple representations are used, because they allow students to make connections within, as well as between, concepts. Providing options for representation is essential.

GUIDELINE 1 - Perception

Interact with flexible content that doesn't depend on a single sense like sight, hearing, movement, or touch.

CLICK HERE

GUIDELINE 2 - Language & Symbols

Communicate through languages that create a shared understanding.

CLICK HERE

GUIDELINE 3 - Comprehension

Construct meaning and generate new understandings.

CLICK HERE

ACTION AND REFLECTION

Learners differ in the ways that they can navigate a learning environment and express what they know. For example, individuals with significant movement impairments (e.g., cerebral palsy), those who struggle with strategic and organizational abilities (executive function disorders), those who have language barriers, and so forth approach learning tasks very differently. Some may be able to express themselves well in written text but not speech, and vice versa. It should also be recognized that action and expression require a great deal of strategy, practice, and organization, and this is another area in which learners can differ. In reality, there is not one means of action and expression that will be optimal for all learners; providing options for action and expression is essential.

1

GUIDELINE 4 - Physical Action

Interact with accessible materials and tools

CLICK HERE

2

GUIDELINE 5 - Expression & Communication

Compose and share ideas using tools that help attain learning goals.

CLICK HERE

3

GUIDELINE 6 - Executive Functions

Develop and act on plans to make the most out of learning

CLICK HERE

A COMPREHENSIVE APROACH TO RETHINK TEACHING METHODOLOGIES

Learning objectives

Traditional curricula focus on objectives related to content and performance; a UDL-based curriculum focuses attention on training "expert learners."

Methods

Evidence-based, differentiated, based on educational goal. In more UDL greater differentiation based on student variability in task, context, social and emotional resources, and classroom environment.

Learning materials

The means used to present learning content, convey conceptual knowledge, construct strategic learning expression of one's knowledge. In UDL, the characteristic element is their variability and flexibility.

Assessment

Process of gathering information about student performance using a variety of methods and materials with the purpose of making informed instructional decisions. In UDL, the goal is to improve the accuracy and timeliness of assessment that is comprehensive and articulate enough to guide everyone's instruction. This is achieved, in part, by a scrupulous focus on the goal, not the means, allowing the use of supports and structures

Some practical examples

Math

Creative writing

Science

TECHNOLOGY AS A TOOL FOR UNIVERSAL DESIGN FOR LEARNING AND INCLUSION

According to the concept note for UNESCO's 2023 Global Education Monitoring Report

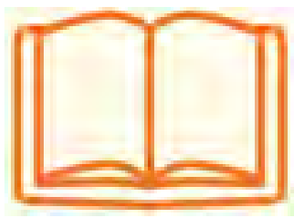
"Technology's capabilities offer education systems tools to overcome longstanding inequalities along two key dimensions: reaching disadvantaged populations and ensuring content reaches all learners in more engaging and cheaper formats (ibid., p. 5)."

The use of digital technologies in school can greatly increase flexibility and provide the environment needed to apply Universal Design for Learning principle. Yet, new barriers to participation in society and education are emerging. These can exacerbate the existing vulnerability of individuals or groups, but also create new forms of vulnerability to social and educational exclusion.

Digital tools are not automatically inclusive,

- they have to be conceived with a design for all / universal design or else they risk to create more exclusion
- teachers' professional development is key to use digital in an inclusive way and grant the primacy of pedagogy

The aim is not just applying suitably designed digital technologies in education, but a digital transformation of the educational system. It requires all levels – from the individual, to the educational institution, to the regional or national level – to be involved. This involvement is crucial if inclusive digital education is to be permanently anchored in the education system's structures.



Concept note for UNESCO's 2023 Global Education Monitoring Report

See **Unit 4** for more info

CONTENT IV

Inclusive digital education

From accessibility and assistive technology to universal design

An emergent set of vulnerabilities that are harder to identify do not arise from the traditionally identified digital divide (digital access vs non-access). [...] more subtle forms of exclusion are related to the ability to critically and reflectively deal with issues such as **privacy, data misuse** (by private and political entities), **data ownership/authorship**, and **social media** (mis)use. Even in contexts where access to new technologies and infrastructures exists, disparities from within the digital platforms may create further disparities and marginalization, limiting empowered usage (UNESCO Institute for Lifelong Learning, 2021, p. 101). To reduce the risk of exclusion in digitalization, and holistically ensure inclusion in high-quality education for all learners, it is useful to consider:

1. 'Vulnerabilities of access and poor technical infrastructures'
2. 'Vulnerabilities of digitally marginalized groups and communities'
3. 'Vulnerabilities related to digital knowledge, literacies and practice'
4. 'Vulnerabilities related to political will, policy development and economic priorities' (UNESCO Institute for Lifelong Learning, 2021, p. 97).

UNESCO Institute for Lifelong Learning, 2021. Inclusive lifelong learning in cities: Policies and practices for vulnerable groups. Hamburg: UNESCO Institute for Lifelong Learning

ASSISTIVE TECHNOLOGIES VS. UNIVERSAL DESIGN (UD)

Active technologies

'Equipment, devices, apparatuses, services, systems, processes and environmental modifications used by people with disabilities to overcome social, infrastructural and other barriers to learning independence, safe and easy participation in learning activities, and full participation in society' (UNESCO, 2020, p. 419).

- ATs can have poor usability (as manufacturers rarely have sufficient knowledge of the field of user interaction) and high costs (AT is often produced in small quantities, so the development costs are spread over just a few units).
- the learners' environment is not always ready to integrate AT. This also goes for teachers, who are often not prepared to incorporate AT in the classroom (Zilz & Pang, 2021).

Vs

Universal design (UD)

'Design of products, environments, programmes and services to be usable by all to the greatest extent possible, with no need for adaptation or specialised design' (UNESCO, 2020, p. 420).

- It is highly usable to a wider range of people, therefore cheaper
- It is easier to integrate in the learning environment because it can be used by all
- It needs research and design to be developed, while adapting existing technology is often easier

Technology is sometimes usable by all people, but not necessarily equally fast, informative, convenient or enjoyable for all

AT should be used as a compensatory means only where UD technology does not (yet) sufficiently satisfy all users' needs. Involving end-users in the development and design process of AT can improve not only its usability but also utility or attractive design (Bricout et al., 2021)

Web Accessibility Initiative

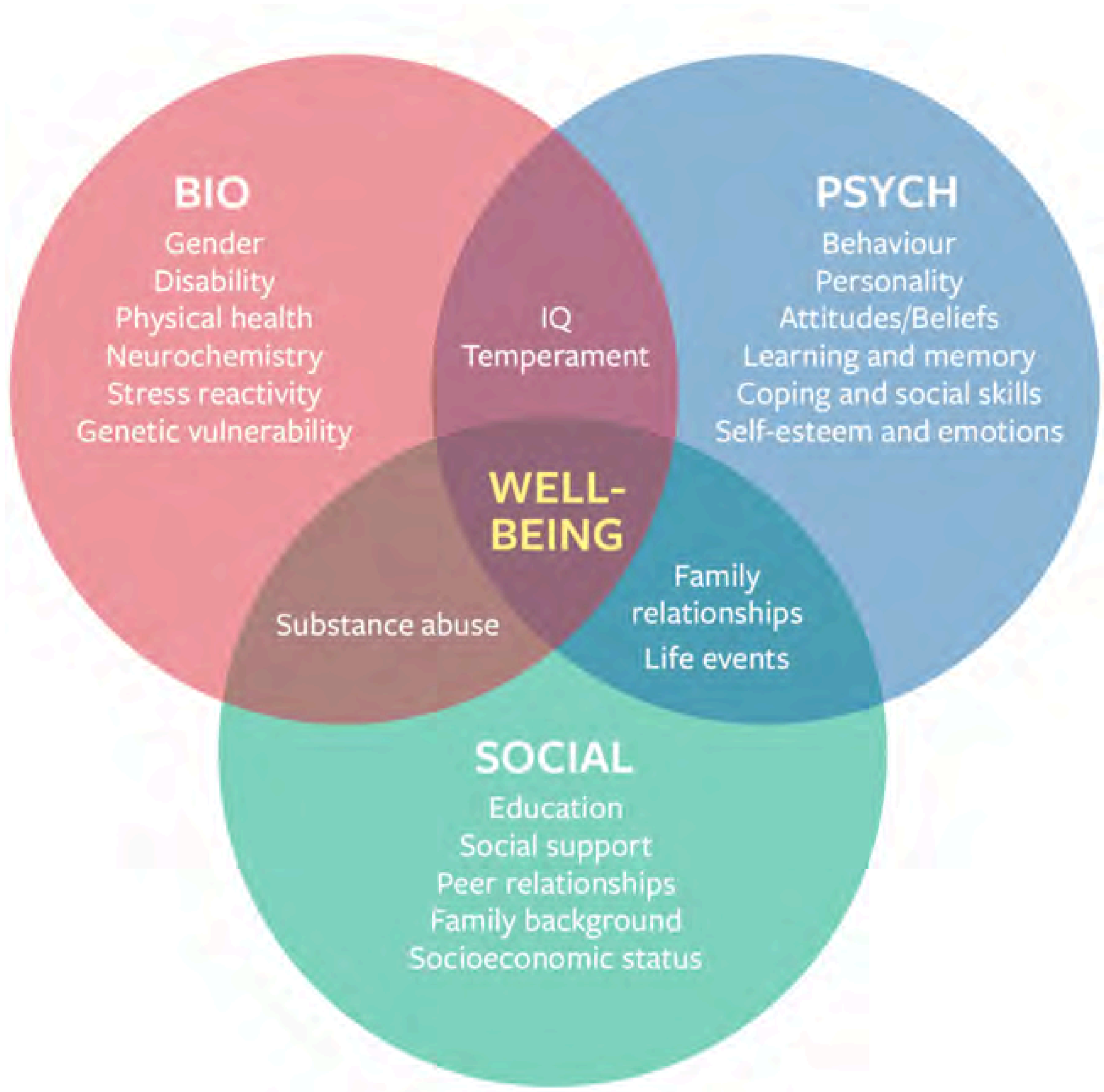
EU Digital Education Action Plan 2020-27

Center for Excellence in Universal Design

ICT and Universal Design

Inclusion in digital education is a **multi-dimensional phenomenon**, which is affected at least by society, technical equipment, the educational institution, the learning situation and the individual learners. Vulnerability to exclusion in digital education can be associated with learning-related phenomena that are strongly linked to societal mechanisms and can therefore be attributed to **intersectionality**.

To tackle vulnerability there is a need to shift from a medical or deficit-oriented type of categorisation and to the social or biopsychosocial model.



Human Givens Institute (2020) Biopsychosocial Model [Infographic]. East Sussex: UK

See **Unit 4** for more info

ICT AND UNIVERSAL DESIGN

- For individual learners, inclusion in digital education is reflected in terms of **technical accessibility**, being present and visible, **being actively socially involved**, interacting and collaborating with one another and feeling appreciated and i**ncluded in the learning community.**
- **Learners' digital competences** play an important role, especially in communication, collaboration and safety, respectful and appreciative social interaction, the development and empowerment of oneself as a digital person, expressing one's own voice, critical reflection on digital media and self-protection against violence in digital environments.
- When designing conditions conducive to inclusion in digital and analogue educational settings, it is necessary to combine the insights gained from different individuals or groups vulnerable to exclusion to derive measures for a **holistic perspective on inclusion** for high-quality education for all learners.

See **Unit 4** for more info

COMBINING THE PRIMACY OF PEDAGOGY WITH A TECHNOLOGY- CENTRIC APPROACH

Primacy of pedagogy

•the selection, design and use of digital technologies and media exclusively follow the requirements of inclusive pedagogy

•It focuses on learners need, using technology only when useful and necessary

•It can stimulate creation of universal design technology to substitute assistive technology

Vs

Technology centric (-driven) approach

•It focuses on specific technologies and presents their potential for supporting inclusive digital education

•It follows the questions: What technologies are currently available?; What could be done with them in the field of inclusive digital education?

•The advantage of such an approach is to stimulate innovative thinking and generate ideas that would never have emerged without knowledge of these technologies.

A technology-centric perspective can be used under the primacy of pedagogy to develop ideas and innovations and to involve the users of these technologies – teachers, learners and other stakeholders – as experts in their own fields.

SOFTWARE AND HARDWARE FOR LEARNING

More targeted use of ICT to create peer-learning opportunities at various levels offers much untapped potential.

(Mobile-learning) 'M-learning is a teaching and learning methodology that uses mobile devices that have wireless connectivity' (Criollo-C, Luján-Mora & Jaramillo-Alcázar, 2018, p. 1). Mobile devices in combination with apps may be a real and efficient alternative to classic ATs, which are often mono-functional and expensive.

Blended learning involves a diversity of approaches to the learning process:

- blending school site and other physical environments away from the school site (either with the presence of a teacher/trainer, or in distance learning);
- blending different learning tools that can be digital (including online learning) and non-digital (Council of the European Union, 2021, p. 12).

Telepresence technology- by providing the illusion of being present in a different place that the one's actual location, telepresence technology enables individuals, such as hospitalised children, to experience presence. Telepresence requires that the users' senses interact with specific stimuli in order to provide the feeling of being in that other location. Additionally, users may be given the ability to affect the remote location.

Massive open online courses (MOOCs) should respond to the call for education for all – even if they are not always free. MOOCs have the potential to improve access for disadvantaged groups of learners if the materials are designed with disadvantaged people and face-to-face learning support is also provided.

Adaptive learning - a method of education or training using computers, that uses algorithms (= sets of mathematical rules) to change teaching material, exercises, etc. according to the needs and performance of each learner.

Gamification is 'the practice of making activities more like games in order to make them more interesting or enjoyable' (Cambridge Dictionary, no date). It can motivate learners and thereby support the learning process.

Open educational resources (OERs) are explicitly intended to improve accessibility to teaching materials. Although they offer the possibility of free use, due to their licensing, their technical and didactic design is not always suitable for all learners.

IMMERSIVE LEARNING ENVIRONMENTS (ILEs)

- Learning situations that are constructed using a variety of techniques and software tools, including game-based learning, simulation-based learning and virtual 3D worlds are distinguished from other learning methods by their ability to simulate realistic scenarios and environments that give learners the opportunity to practice skills and interact with other learners (Gartner Information Technology Glossary, 2022).
- Augmented reality (AR), Virtual reality (VR) – often increase learner focus and engagement. This visualisation makes it easier for learners to understand abstract concepts and they often get a better understanding and assessment of rare situations (Boyles, 2017). The technology's high degree of interactivity promotes pro-active learning and the assimilation of different situations. Regarding inclusion, AR has been judged to be capable of improving access to content and eliminating barriers. However, while there are many audience-specific applications in this area, there is no known application that allows every learner in a diverse class to participate equitably in the learning experience.
- VR can also be a support to develop an adaptive e-learning system that provides personalised learning services and study materials for all learners. AI techniques, such as deep learning and computer vision, could also be used to develop smart learning assistance tools for inclusive education.

VR or AR tools can be used to simulate classroom experiences for educators. In this way, educators get guided practice in implementing classroom management strategies.

TEACHERS PD AND INCLUSIVE DIGITAL EDUCATION

- Digital media do not work in isolation in terms of positively or negatively influencing learning success or inclusion. They must always be seen in interaction with other factors, such as teachers' competences and attitudes, as well as technical and time resources and appropriate support.
- Teachers need to select inclusive teaching materials that present no or few barriers and are suitable for all learners. AT should be included in training to enhance its use.
- Competencies like media literacy, data literacy and data-based decision-making are important in the context of inclusive digital teaching.
- Inclusion-oriented didactics aims to do justice to diversity: it is necessary to examine which educational goals are relevant for all, taking into account their individuality. Approaches that support self-directed and independent learning are important. Social and co-operative learning also play a special role.

See **Unit 3** for more info

INCLUSIVE DIGITAL EDUCATION AND EDUCATIONAL SETTINGS

Regarding educational settings, it is necessary to not only focus on individual cases but to aim for a holistic perspective on inclusion for all learners. Therefore, inclusion in digital education requires:

- analysis of the individual learners' level of inclusion with regard to access, social participation and perceived inclusion;
- analysis of relevant elements of the individual learners' environment that affect inclusion in the learning setting while considering digitalisation. This involves the teaching-learning setting itself, the educational institution as an organisation, relationships with peers, teachers and other involved persons and all other relevant parts of the learner's environment (e.g., family, society, etc.);
- careful examination of digital media's potential to reduce inequalities and support access, participation and inclusion but also to consider the risks of digitalisation for exclusion and its prevention;
- identification of pedagogical interventions to reduce exclusion and enhance the individual learner's inclusion and to consequently reflect inclusion for all.

See **Unit 4** for more info

CASE STUDY 1: MAGIC ROOM OF MILAN POLYTECHNIC

A short story from the field

The magic room is an immersive learning environment where children with mixed abilities can interact with different computer simulated situations. These simulations can teach everyday life skills, or enhance cooperation among children, or enact problem solving scenarios. Children are encouradged to work together and find common solutions.

What is the point

The magic room is a versatile environment that can be used to achieve a variety of learning outcomes. It creates a space for children with mixed abilities to interact with each other on real life problems, or on disciplinary issues. It is inclusive because it is designed to need everybody's cooperation to reach a common solution.

Some questions for reflection

What possible use do you see for a magic room in your schools?

What potential do you see in an immersive environment for inclusion?

Which challenges do you see in using this kind of digital tools?

CASE STUDY 2: DISTANT LEARNING TO SUPPORT VULNERABILITY

A short story from the field

«I am a principal in a rural area, with schools spread on a vast territory. It is therefore not easy to organize afterschool activities to support vulnerable students' learning needs. The school bus is not available, and their parents cannot drive them.»

The solution was creating a digital study room with reserved "seats", where students could connect to do their homework or special activities. Each digital room offered 20 sits and was supervised by an adult. Students could work silently, or ask each other, or the adults for help and support, sharing questions, answers, and common solutions.

What is the point

This principal faces the challenge of helping vulnerable students, living in a rural and widespread territory with their learning needs. The solution was creating a digital space where students could connect to do their homework or special activities. The possibility to work together, although at the distance, gave them motivation and helped them overcome difficulties, improving learning outcomes for all.

Some questions for reflection

As a leader, what challenges do you face to help vulnerable students with their learning?

Could remote learning be of help?

What opportunities do digital tools offer in your schools for vulnerable students?

CONTENT V

Inclusive assessment

What is assessment

The Keeves/UNESCO (1994) definitions were applied - assessment is understood to refer to determinations and judgements about individuals (or sometimes small groups) based on some form of evidence.

Assessment refers to the ways teachers and other people involved in a learner's education systematically collect and then use information about that pupil's level of achievement and/or development in different areas of their educational experience (academic, behaviour and social).

Beside summative assessment to determine individual achievement, teachers utilize formative assessment, that:

- Is directly linked to programmes of learning that all pupils (those with and without SEN) follow;
- Is mainly non-comparative with the focus being on information that helps teachers plan next steps for individual pupil's learning (formative assessment);
- May or may not have some summative elements linked to strategic points in teaching programmes.

Key is using assessment as a way to raise achievement of all learners.

PRINCIPLES UNDERPINNING INCLUSIVE ASSESSMENT

The overall goal of inclusive assessment is that all assessment policies and procedures should support and enhance the successful inclusion and participation of all pupils vulnerable to exclusion.

The principles underpinning inclusive assessment

- All assessment procedures should be used to inform and promote learning for all learners;
- All learners should be entitled to be part of all assessment procedures;
- All assessment procedures should be complementary and inform each other;
- All assessment procedures should aim to ‘celebrate’ diversity by identifying and valuing all learners’ individual learning progress and achievements;
- Inclusive assessment explicitly aims to prevent segregation by avoiding forms of labelling, that focus on learners’ deficiencies. Instead, it uses an educational/interactive approach that can increase the chance of successful inclusion by considering a pupil’s strengths and applying assessment information directly to strategies for teaching and learning.
- All assessment procedures, methods and tools should inform teaching and learning and support teachers in their work;
- All assessment procedures should avoid ‘high stakes’ assessment and minimises the potential negative consequences of any assessment process or procedure for all learners.

METHODS FOR INCLUSIVE ASSESSMENTS

- Inclusive assessment methods report on the product or outcomes of learning, but also provide teachers with information on how to develop and improve the process of learning for an individual pupil or groups of pupils in the future;
- Decision-making based upon inclusive assessment draws upon a range of sources that are action-based and presents evidence of learning collected over a period of time (and not snapshot, one off assessment information);
- A wide range of assessment methods are necessary in inclusive assessment in order to make sure that there is a wide coverage of areas (non-academic as well as academic subjects) assessed;
- Assessment methods should aim to provide 'value added information' on pupil's learning progress and development, not just snapshot information;
- Any assessment information should be contextualised and the educational environment as well as any home-based or environmental factors that influence a pupil's learning should be taken into account;
- Inclusive assessment should extend to assessing the factors that support inclusion for an individual pupil in order that wider school, class management and support decisions can be effectively made.

Assessment strategies	**Potential use of digital**
Developing co-operative multi-disciplinary teams to contribute to ongoing assessment in mainstream classes	Social media, repositories, online meetings
Assessment procedures that link and follow-on from one stage of schooling to another	Social media, videos during class work or school activities
Broadening the focus of assessment to cover more than just academic/subject based content and include also socio-emotional situations.	Online open ended questions, electronic bulletin boaRd, video shooting
Providing pupils with information about success in their learning is felt to be motivating, but by making sure pupils understand how they learned something (as well as what they learned) assessment becomes a tool for pupils to understand their own learning processes.	Online logbooks, blogs
Developing the range of assessment methods, tools available to mainstream class teachers, taking self evaluation in special consideration	Online multiple choices, self-assessment checklist; online checklist, multiple choice, matching, label an immage
Developing new ways of recording assessment information and evidence of pupil's learning.	Online portfolio, preparation of presentations and eBooks, snapshots,

CASE STUDY 3: SCHOOL AT THE MUSEUM

A short story from the field

"Our students spent a week of lessons at the town museum and we wanted for them to take full advantage of the immersive learning environment, but we did not know how to trigger metacognitive and self evaluative processes starting from the activities organized by museum educators."(Primary school, Italy)

Students were divided into small groups, each responsible to document one day of activities using digital tools. Pictures, texts, interviews, collected during the day by each group had to be assembled and eventually became a comprehensive and coherent digital narrative of the week.

What is the point

The team of teachers faced the opportunity and the challenge of spending a week with her class in an immersive, multimodal, interdisciplinary context, such as the museum, and needed a way to help students focusing not to be overwhelmed by the quantity of stimulus offered.

Teachers aimed to foster metacognitive process in order to work on competences such as self-evaluation and learning to learn. To do so within the school in the museum context, they decided to use digital tools.

Some questions for reflection

As a leader, how can you foster the use of digital as reflexive tool for students?

How to assess digital competences and how to assess using digital tools?

What kind of training would your teachers need to this end?

Can this process be triggered even outside of an immersive context such as the museum?

CONTENT VI

Q&A

1.How does intersectionality affects successful inclusion in education?

a) Intersectionality implies that there are multiple factors and disadvantages that affect vulnerable groups, and therefore to grant successful inclusion in education schools must consider learners experiences of inclusion and exclusion also out of the teaching-learning situation

b) Intersectionality is the factor that affect vulnerable groups, and therefore to grant successful inclusion in education schools must counteract this condition

c) Intersectionality concerns the connections between different disciplinary fields. All students should have these connections clear

2. How can we define inclusion?

a) A process consisting of actions and practices that embrace diversity and build a sense of belonging, rooted in the belief that every person has value and potential and should be respected

b) Inclusion is understood as a theoretical construct in the sense of a desirable goal to be reached, rather than as a current societal reality.

c) Both are correct

3. What should be the correct relationship between technology centric perspective and primacy of pedagogy for digital implementation in schools?

a) A technology-centric perspective must be recognised as a priority in order to innovate school and learning processes and inform pedagogical choices

b) A technology-centric perspective can be used under the primacy of pedagogy to develop ideas and innovations and to involve the users of these technologies as experts in their own fields

c) Digital implementation in schools requires a strong investment in digital equipments in order to rethink innovative teaching

4. Why is Universal Design for learning a coherent approach to foster successful inclusive education?

a) The universal design promotes an approach to learning that grants equal dignity to all disciplines. It is therefore inclusive

b) The universal design mindset aims to implement educational settings that are built for all learners. It is a preventive approach and therefore it foster inclusion

c) both are correct

5. When should Assistive Technologies (AT) be used instead of Universal Design for Learning?

a) AT should be always used, they are the basis for true inclusion.

b) AT do not grant the same quality access to all users, therefore they should never be used

c) AT should be used as a compensatory means only where UD technology does not (yet) sufficiently satisfy all users' needs. Involving end-users in the development and design process of AT can improve not only its usability but also utility or attractive design

6. What is the use for inclusive assessment?

a) Inclusive assessment methods report on the product or outcomes of learning, but also provide teachers with information on how to develop and improve the process of learning for an individual pupil or groups of pupils in the future

b) Inclusive assessment methods are comparative and provide teachers napshot information

c) Inclusive assessment methods are the responsibility of specialised teachers and do not take self evaluation in consideration

BIBLIOGRAPHY

European Agency for Development in Special Needs Education (2011) Teacher Education for Inclusion Across Europe – Challenges and Opportunities, Odense, Denmark: European Agency for Development in Special Needs Education.

European Agency for Special Needs and Inclusive Education, 2019. Inclusive School Leadership: Exploring Policies Across Europe. (E. Óskarsdóttir, V. Donnelly and M. Turner-Cmuchal, eds.). Odense, Denmark.

European Agency for Special Needs and Inclusive Education, 2022. Inclusive Digital Education. (H. Weber, A. Elsner, D. Wolf, M. Rohs and M. Turner-Cmuchal, eds.). Odense, Denmark.

UNESCO (1994) World Conference on Special Needs Education: Access and Quality, Salamanca, Spain.

UNESCO (2009) Policy Guidelines on Inclusion in Education. UNESCO, Paris.

UNESCO (2020) Global Education Monitoring Report 2020: Inclusion and Education: All means all. Paris, UNESCO.

UNESCO Institute for Lifelong Learning, 2021. Inclusive lifelong learning in cities: Policies and practices for vulnerable groups. Hamburg: UNESCO Institute for Lifelong Learning.

United Nations (2006) Convention on the Rights of Persons with Disabilities. New York, United Nations.

Watkins, A. (Editor) (2007) Assessment in Inclusive Settings: Key Issues for Policy and Practice. Odense, Denmark: European Agency for Development in Special Needs Education.

CAST (2018). *Universal Design for Learning Guidelines version 2.2.* Retrieved from http://udlguidelines.cast.org

https://education.ec.europa.eu/focus-topics/digital-education/action-plan

https://unevoc.unesco.org/home/Digital+Competence+Frameworks/lang=en/id=4

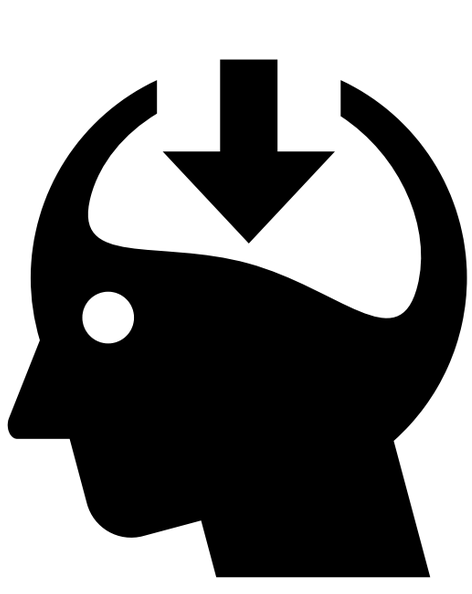
Learning Unit 2

Promoting Digital Intelligence in the Primary School Community

Nicolas Demertzis, Patricia Gerakopoulou & Katerina Vezyrgianni

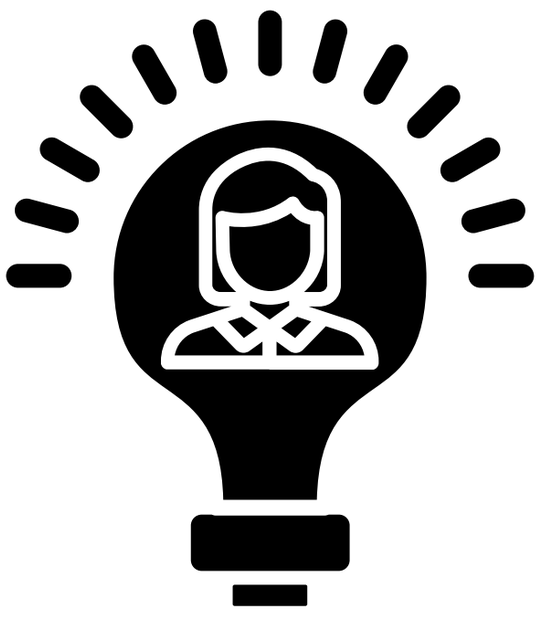
Content I

Introduction: Learning Objectives Upon the completion of this training, you are expected



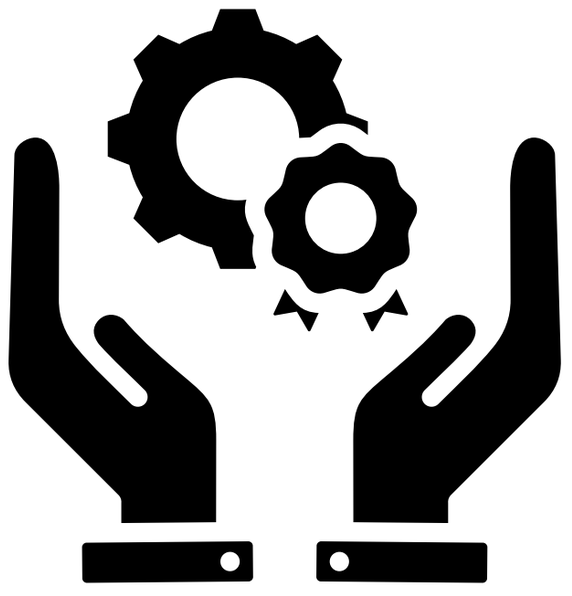
To know…

- what inclusive digital intelligence is and effectively apply it in different pedagogical contexts
- about the potential risks and dangers associated with the use of digital technology, specifically hyperconnectivity and cyberbullying
- how to move from digital data to digital knowledge and then to digital wisdom and digital phronenis as a means to promote inclusivity and interculturality in primary school



To understand…

- the need to regulate the time, manner and amount of communication in a way that respects privacy and safety
- the nature of digital footprints and their real-life consequences, in order to manage them reflexively and responsibly
- the need to distinguish between true and false information, good and harmful content, and trustworthy and questionable contacts online



To be able to…

- reflect on the school's pedagogical approach in a manner that is empathetic towards one's own and others' needs and feelings online
- effectively and inclusively foster healthy communication about digital media in the primary school environment
- become a part of the digital eco-system by co-creating new content and turning ideas into reality by using digital tools

CONTENT II

On Digital Intelligence

Digital intelligence (also known as digital intelligence quotient) refers to an all-encompassing set of technical, cognitive, social, and emotional competencies that enable individuals to face the challenges of digital life. This kind of intelligence addresses the what, why, where, when, who, how, and how much of digital technology to improve our operational efficiency and performance.

(Sadiku, M.N.O., Musa, S.M. 2021)

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A new intelligence has begun to emerge—one that allows us to effectively fashion products that are of consequence in this new cultural and community setting. [...] By acknowledging the existence of a new digital intelligence and all of the implications this acknowledgement may create for education and communication, we increase our ability to develop effective strategies to accommodate this new intellectual style.

(Adams, N. B. 2004)

DISCUSSING DIGITAL INTELLIGENCE

The capabilities of digital intelligence contribute to the effective building of network communication and the expansion of the capabilities of the virtual world. But the main advantage of digital intelligence is a person's high self-control, ensuring a healthy balance between online and offline life, as well as the ability to intelligently and constructively manage the content of his life using adequate means of protection against cyber threats. (Vladimirovna et al., 2020).

Digital Intelligence is the world's first global standard related to digital literacy, digital skills, and digital readiness, the IEEE 3527.1™ Standard for Digital Intelligence (DQ), which was approved by the IEEE Standards Board on 24 September 2020. At policy recommendation level, it is constructed as an institutionalized agile tool and translated into inclusive education. The development of IEEE P3527.1 Standard for Digital Intelligence (DQ) aims to develop Digital Literacy, Skills and Readiness, leading to further standards development projects and relevant certification programs. Interestingly, the DQ online tool serves as a living document that enables the DQ Framework to continuously evolve with feedback and early detection of new competencies related to emerging technologies.

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DIGITAL INTELLIGENCE VS. DIGITAL COMPETENCE

According to the Council Recommendation (2018/C 189/01, p. 9), **Digital Competence** refers to 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.

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Apparently, the two concepts have much in common; however, **Digital Intelligence** is more than a professional skill. It encompasses intellectual and ethical tenets which make for a new cultural stance for human communication both offline and online. Digital Intelligence, as a tool, involves a useful comprehensive set of digital competencies rooted in universal moral values for all individuals (within school environments) to maximize digital consciousness-raising, as well as to use, control, and create technology to benefit humanity.

CONTENT III

Benefitting from Digital Intelligence

THE APPLICABILITY OF DIGITAL INTELLIGENCE

In which areas could Digital Intelligence serve primary school principals' needs?

Digital Intelligence pertains to eight areas that are essential to primary school principals' scope of interest and practice. They are as follows: (a) digital identity, (b) digital use, (c) digital safety, (d) digital security, (f) digital emotional intelligence, (g) digital communication, (h) digital literacy, and (i) digital rights.

This new type of (meta)intelligence is a human capacity that combines knowledge, ways of knowing, and the ability to interact effectively in a diverse and multicultural primary school setting.

Digital rights are those human rights and legal rights that allow individuals to access, use, create, and publish digital media or to access and use computers or other electronic devices, and telecommunications networks.

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THE SCOPE OF DIGITAL INTELLIGENCE

DIGITAL MATURITY

Digital Intelligence can be inclusively embraced by all primary school actors as a kind of meta-intelligence (one that is composed of many constituent intelligences), with the aim to boost three levels of **digital maturity**:

Level 1 - Digital Citizenship: the ability to use digital technology in safe and ethical ways.

Level 2 - Digital Creativity: the ability to become part of the digital learning ecosystem and to create new knowledge, technologies, and content to turn ideas into reality.

Level 3 - Digital Competitiveness: the ability to solve global challenges, and to create new learning experiences and opportunities in the digital economy (Deepak, 2017) .

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Regarding projects or resources that can give fruitful ideas or tools for cultivating Digital Intelligence, the Greek edition of the European Digital Competence Framework for Citizens DigComp 2.2, released in 2022 by the Joint Research Centre of the European Commission, is now available to the Greek public from the General Secretariat for Digital Governance and Simplification of Procedures. The Greek edition of DigComp 2.2 (DigComp 2.2: The Digital Competence Framework for Citizens) is part of the National Coalition for Digital Skills and Jobs.

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This is in alignment with the Digital Transformation Bible, which is the national strategy for the digital transformation of the country. Another example is the Citizen's Digital Academy, an initiative of the Ministry of Digital Government of Greece.

For Italy see the initiative CLICK HERE

See also the EU report on 'Promoting Effective Learning in the Digital Age – The European Framework for the Digital Competence of Education Organizations.'

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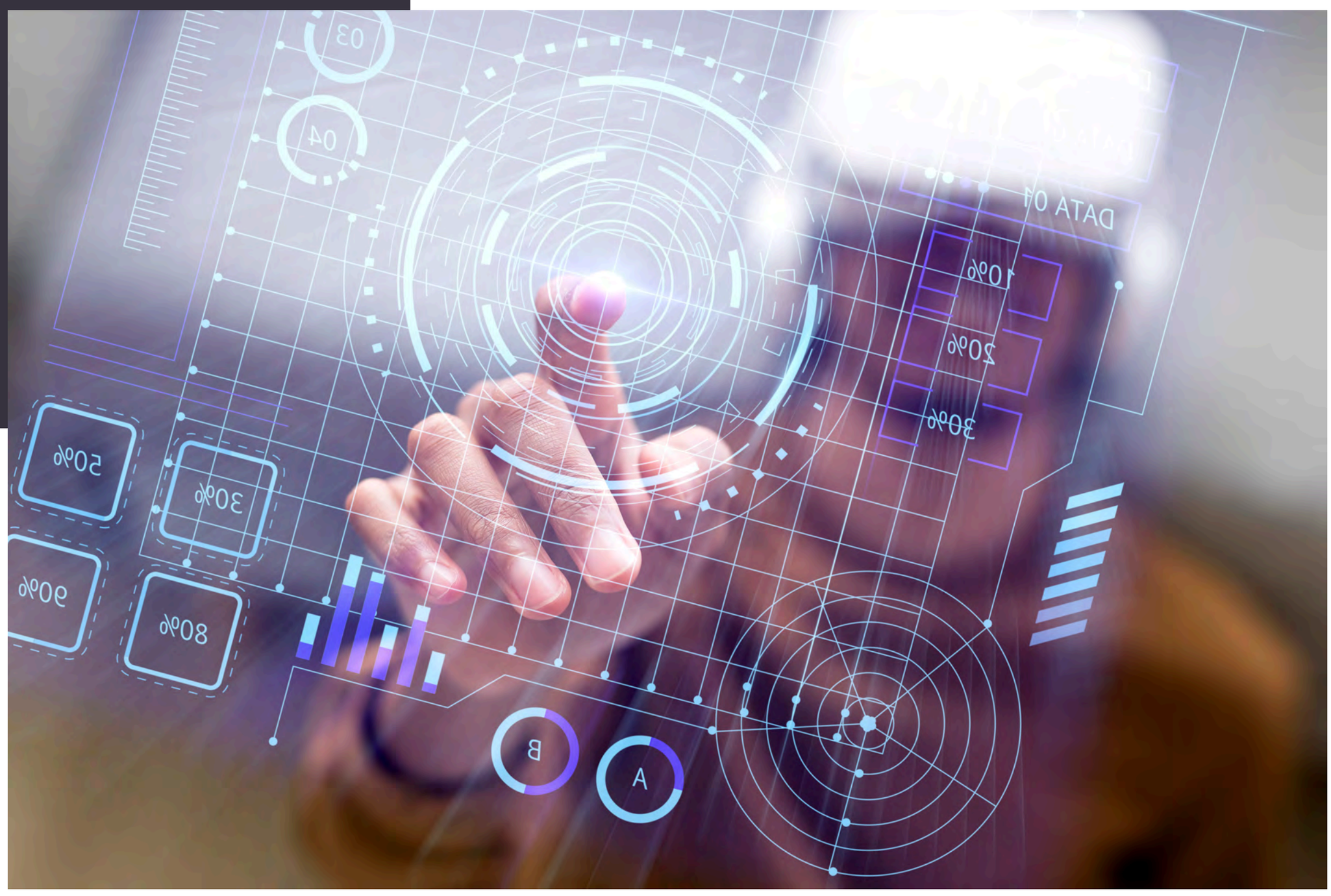
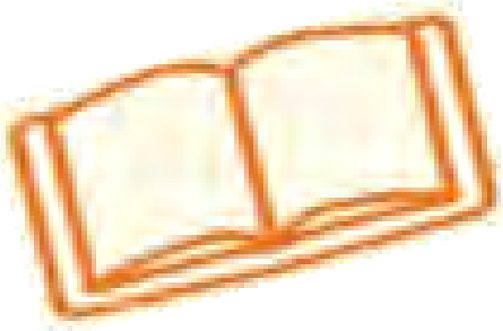


COMMUNITIES OF LEARNING

Through digital maturity, schools may become “communities of learning”, facilitating culturally responsive teaching, innovative school leadership, inclusivity, and education equity (Sackney et al., 2005).

Digital Intelligence may also encourage principals to more easily adopt the **transformational leadership role *vs* the instructional leadership style** (Hallinger, 2003).

See **Unit 1** for more info



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RESPONSIBILITY AND SUBJECTIVITY

Other dimensions of digital maturity involve **responsible digital consumption** and the ability to **organize digital subjectivity** (maintaining a healthy personality both in the virtual world and offline), as well as to **plan digital activities** in accordance with goal setting. The latter includes **adequate management of time** spent in front of the monitor screen and **self-control** to prevent information and network dependence.

Digital responsibility refers to using digital technology in a constructive, proactive and sustainable way for oneself and others. This particularly involve the use of appropriate language and behavior when interacting online with others (i.e., no cyberbullying; respect the opinions and ideas of others; do not use or share others' work without permission, and so on). All learners, regardless of socioeconomic status or gender, must have access to digital technologies.

DIGITAL AGILITY

For principals, Digital Intelligence also pertains:

- to evaluate the implications and dynamics of new digital technology adoption;
- addressing change management;
- and assessing the maturity of the primary school to handle e-learning and digitalization projects.

Moreover, the likelihood is that digital intelligence will prone actors to develop digital agility/capability which means that educational organizations are able to promote effective learning in the digital age. In this regard, the Digital Competence Framework for Citizens seeks to: facilitate digital participation and transparency; encourage education and training organisations to make effective use of digital technologies for teaching and learning; support principals and policymakers in designing and implementing actions to improve the digital capacity of education and training organizations.

As a way to promote digital responsibility and digital ability, the Citizen's Digital Academy in Greece offers a relevant self-evaluation tool:

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AVOIDING TECHNO-STRESS

By cultivating Digital Intelligence in primary schools context all learners will be aware of:

- using social media with empathy,
- creating a reflective digital identity and maintaining a proper e-reputation,
- avoiding techno-stress and burnout through mindfulness and other tech-detoxification activities.

DIGILOGUE CITIZENSHIP

By cultivating Digital Intelligence in the primary school context:

will also be aware of a common value-based language of the digital, a new type of open strategic intelligence. This involves building a **digilogue citizenship** (both digital and analogue) and an ethical digital ecosystem as a collective responsibility, with diversified digital skills, competencies, knowledge, and critical awareness.

The ultimate resource for digilogue citizenship is the Digital Intelligence (DQ) Framework and the DQ online tool.

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ENSURING EQUAL OPPORTUNITIES AND CORRECT USE

Digital Intelligence can promote a shared understanding of digital literacy and digital skills, thus avoiding a lot of conceptual confusion and inconsistency in education.

Principals can take Digital Intelligence initiatives by first realizing their role in ensuring opportunities for children's equal access to a wide variety of digital learning materials but also to assure the ability of using them correctly.

Principals have to assure the ability of using them correctly through the:

- development of information and media literacy
- recognition of reliable sources
- skills of fact-checking and content verification
- reliance on trusted recommendations
- sharing of online experiences and concerns

See **Unit 1** for more info about the maintenance of digital infrastructure in schools

See **Unit 1** for more info about the equity of digital education

THE COMPONENTS AND THE RATIONALE OF DIGITAL INTELLIGENCE

Which are the structural components of Digital Intelligence in primary school?

The main structural components are:

- high critical reasoning and the ability to reflect within the digital worlds;
- the ability to communicate effectively, involving the ability to build and maintain social contacts online (which in turn implies a high emotional intelligence);
- a high degree of self-regulation, ensuring the success of digital activities.

THE RATIONALE OF DIGITAL INTELLIGENCE

What is the rationale behind Digital Intelligence in primary school?

The situation where we only upgrade obsolete teaching content to new versions is becoming largely insufficient. And this is true not only about the digital technology-linked teaching content, but also about the teaching content of all primary school subjects. The current changes in knowledge and society require exponential thinking and a fundamental transformation of the education system. Digital technologies are no longer only about computer skills, writing in a text editor, or sending e-mails. They are something that inevitably penetrates our lives and changes our worldview; therefore, **we need a new mindset**. The primary school system must react to this fundamental change by cultivating futures-oriented Digital Intelligence.

HELPING PRIMARY SCHOOL PRINCIPALS AND AVOIDING TECHNO-STRESS

How can we help primary school principals obtain a scholarly understanding of children's engagement with digital technologies?

- First, by getting acquainted with scholarly research about children and digital technologies on online risks to children; youth digital skills; cyberbullying; children's data and privacy in the digital age; and digital technologies and children's well-being.
- Second, by using research in education which provides educators and practitioners practical ideas and tools to make their work more impactful (e.g., to inform awareness-raising campaigns, to apply for funding, to improve mentoring, etc.).
- Third, by staying up to date with information and tips on where to find high-quality interdisciplinary research, and a selection of high-quality resources for teachers, practitioners, and policymakers.

DIGITAL ETHICS

Is digital technology in primary education good or bad?

The technology itself isn't good or bad; neither it's neutral. It can be better evaluated and characterised when used at scale and, of course, it can be used by bad people to do bad things. This is why investing the time and resources in AI ethics –and digital ethics in general– is so critical for Digital Intelligence in primary school.

This will help us understand how to prevent abuse and promote responsible AI use (including social media use) among children and teachers. Because AI can't yet think for itself, **we need smart educators who can collaboratively build positive narratives and uses of AI.**

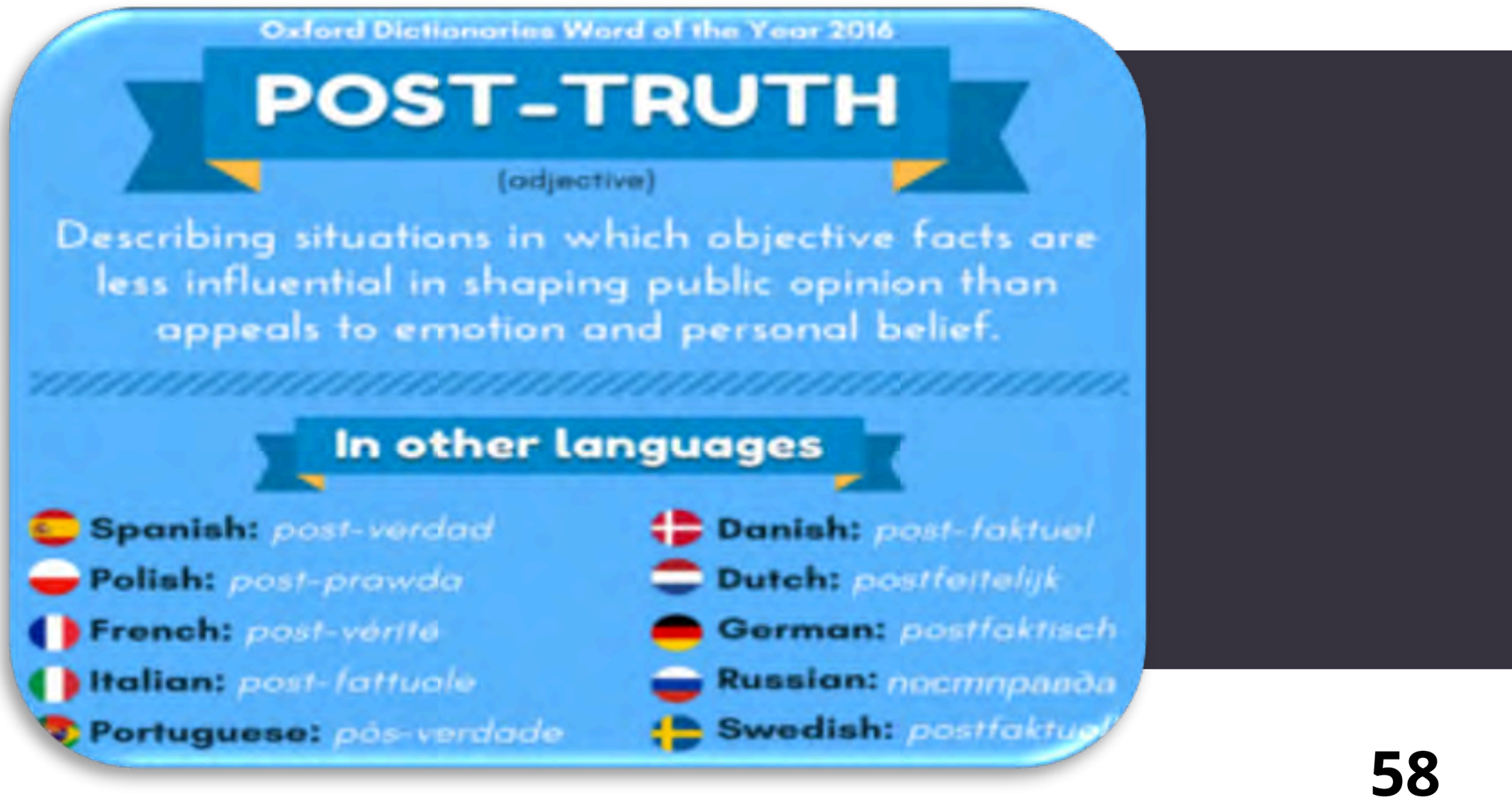
TRUTH AND DIGITAL INTELLIGENCE

For what reason Digital Intelligence is so important in order to defend the truth?

- If we do not educate children, or inform them, on how to make decisions on the trustworthiness of what they're consuming online
- if we do not introduce media and information literacy levels to discern between news and fake news
- if we do not cultivate data and algorithmic awareness

then

We will continue to advocate the problem of post-truth (and digital toxicity) and increase the issues history has taught us not to do.



CONTENT IV

Case Studies

CASE STUDY 1: THE CASE OF NIUE

A short story from the field

A case study on digital evolution and digital intelligence has taken place in Niue, a small island nation associated to New Zealand, a 250 Square Km coral island in the Pacific with a population of 1700 and some 400 children, attending two schools, elementary and primary. The island has been well connected by wi-fi and many laptops were given to children and teachers on the island, in parallel to digital education.

What is the point

Niue could be considered the first fully saturated “digital nation”. It is expected that the ‘stabilization’ of the new digital environment in different regions of the world will provide valuable information about the multiple ways of unfolding a digital culture. This fact reminds the story of Charles Darwin in the Galapagos Islands. Darwin discovered in those islands a variety of finches that were later described as thirteen different species, and this discovery became a landmark in the genesis of the theory of evolution.

Some questions for reflection

Are we going to find different varieties of digital natives depending on the culture of the different human societies?

How can we use the conception of Digital Intelligence as a means for dialogue, understanding and cooperation between these different varieties?

Source: Battro, A.M. (2009). Digital Intelligence: The evolution of a new human capacity, *Scientific Insights into the Evolution of the Universe and of Life Pontifical Academy of Sciences*, Acta 20, 2009.

CASE STUDY 2: EU CODE WEEK MOOC

A short story from the field

EU Code Week is a European grassroots initiative, organised in October every year. The initiative and the events aim at awakening citizens' and especially teachers' and children's interest in coding, computational thinking, robotics, and related digital skills. Millions of participants, including schools, institutions and people of all ages, cultures and backgrounds take part in the initiative each year.

Especially, the EU Code Week MOOC is a massive open online course, designed by European Schoolnet within the framework of the EU Code Week initiative - a large-scale European initiative, which aims to promote coding for everyone. The MOOC targets teachers from primary (and secondary) schools, interested in learning more about the different ways, in which they can encourage computational thinking and the development of programming skills in their classrooms.

What is the point

In this context, primary school principals and teachers have the chance to discover the potentials of the use of Artificial Intelligence in education and will be able to experiment with new learning materials, creating new personalised activities. The MOOC is structured following a blended learning approach that provides for on-site study groups, hand in hand with activities carried out online. This will allow principals and teachers to connect with like-minded colleagues and create an active community that will be able to exchange good practices and foster collaboration and teamwork in the classroom, thus boosting Digital Intelligence.

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Some questions for reflection

In which ways can we foster the exploration and understanding of the potentials of the use of Artificial Intelligence and Robotics in primary school education?

How can we be able to imagine and experiment with new learning materials in order to develop ethical practices and create new personalised activities in primary school?

CASE STUDY 3: PANHELLENIC OPEN TECHNOLOGIES IN EDUCATION COMPETITION

A short story from the field

The Panhellenic Open Technologies in Education Competition is an annual national initiative (Greece). It is carried out with the approval of the Greek Ministry of Education and Religious Affairs, and is co-organised with the Onassis Foundation, universities, research centres, regions, municipalities and bodies from all over Greece. It is addressed to groups of primary (and secondary) school pupils and teachers, with the participation of vocational schools. It receives space within primary (and secondary) schools.

What is the point

The Panhellenic Open Technologies in Education Competition seeks the systematic introduction of open materials, software and open educational content at all levels of education. It is also well known that open technologies open horizons, encourage creativity, enhance experimentation and support children's inventive thinking and initiative. All actors taking part in this contest try to reshape their and their community's daily habits, using tools such as open technologies, materials, educational resources and participatory creative activities. Pupils and teachers discover new forms of intervention in a variety of issues through the artefacts they create.

CLICK HERE

Some questions for reflection

In what ways the systematic introduction of open materials, open software and open educational content could advance Digital Intelligence in primary school? How could open contents, materials and technologies offer a sustainability model to address day-to-day challenges in improving human well-being, social equality, and environmental justice?

CONTENT V

Q&A

1.Digital Intelligence is the sum of:

a) social abilities.

b) emotional and cognitive abilities.

c) all of the above abilities.

2. Digital Intelligence enables individuals:

a) to solve digital problems.

b) to be robust in the digital world.

c) to face the challenges and adapt to the demands of life in the digital world

3. Recognizing Digital Intelligence will expand the scope of:

a) teaching in the 21st century.

b) learning in the 21st century.

c) teaching and learning in the 21st century

4. Recognizing Digital Intelligence will expand the scope of:

a) all aspects of one's personal and professional lives.

b) one's personal life.

c) one’s professional life.

5. Digital Intelligence is:

a) both measurable and learnable.

b) measurable but not learnable.

c) learnable but not measurable.

6. Digital Intelligence comprises of:

a) 6 areas.

b) 8 areas.

c) 10 areas

Self Evaluation

Question 1

Q.: What universal standards are promoted through Digital Intelligence?

A.: Digital Intelligence is the world's first global standard related to digital literacy, digital skills, and digital readiness.

Question 2

Q.: Which are the 8 areas of Digital Intelligence?

A.: Digital identity, digital use, digital safety, digital security, digital emotional intelligence, digital communication, digital literacy, and digital rights

Question 3

Q.: What is digital citizenship?

A.: The ability to use digital technology in safe and ethical ways.

Question 4

Q.: How can we support children's engagement with digital technologies?

A.: By staying up-to-date with scholarly research about children and digital technologies on online risks to children; youth digital skills; cyberbullying; children's data and privacy in the digital age; and digital technologies and children's wellbeing.

Question 5

Q.: Is digital technology in primary education good or bad?

A.: The technology itself isn't good or bad; neither it's neutral. Digital intelligence can help us ethically use and promote digital technology in primary education and in general.

Question 6

Q.: How can we defend truth using digital intelligence in primary school management?

A.: i) If we educate children on how to make decisions on the trustworthiness of what they're consuming online,
ii) if we introduce media and information literacy levels to discern between news and fake news,
iii) if we cultivate data and algorithmic awareness.

BIBLIOGRAPHY

Adams, N. B. (2004). Digital intelligence fostered by technology. *Journal of Technology Studies*, 30(2), 93-97.

Adams, N. B. (2011). Digital Intelligence: A New Way of Knowing. In G. Vincenti, & J. Braman (Eds.), *Teaching through Multi-User Virtual Environments: Applying Dynamic Elements to the Modern Classroom* (pp. 59-65). IGI Global.

Battro, A.M. (2009). Digital Intelligence: The evolution of a new human capacity, Scientific Insights into the Evolution of the Universe and of Life Pontifical Academy of Sciences, Acta 20, 2009.

Chawla, D.S. (2018). The need for digital intelligence. *Nature,* 562, S15-S16.

Council Recommendation of 22 May 2018 on key competences for lifelong learning, 2018/C 189/01.

Deepak, A. (2017). DQ is the capacity to be aware of, participate and contribute in the digital economy for professional and personal reasons. *ScooNews*, 30 May 2017. https://scoonews.com/news/news-dq-is-the-capacity-to-be-aware-of-participate-and-contribute-in-the-digital-economy-for-professional-and-personal-reasons-1773/

Dostál, J., Wang, X., Steingartner, W., & Nuangchalerm, P. (2017, September). Digital intelligence-new concept in context of future school of education. In *Proceedings of ICERI2017 Conference 16th-18th November*.

European Commission/EACEA/Eurydice (2019). *Digital Education at School in Europe. Eurydice. Report*. Luxembourg: Publications Office of the European Union.

Hallinger, P. (2003) Leading Educational Change: reflections on the practice of instructional and transformational leadership. *Cambridge Journal of Education*, 33(3), 329-352. DOI: 10.1080/0305764032000122005

Manasia, L., Pârvan, A., & Ianos, G. (2018). Memories from the future. Is digital intelligence what matters in the forthcoming society?. In *EDULEARN18 Proceedings* (pp. 7899-7906). IATED.

Park, Y., ed. (2019). *DQ Global Standards Report 2019*. DQ Institute.

Sackney, L., Walker, K., & Mitchell, C. (2005). Building capacity for learning communities: Schools that work. REICE. RevistaIberoamericanasobre Calidad, Eficacia y Cambio enEducación, 3(1), 9-16.

Sadiku, M.N.O., & Musa, S.M. (2021). Digital Intelligence. In: A Primer on Multiple Intelligences. Springer, Cham. https://doi.org/10.1007/978-3-030-77584-1_13

Vladimirovna, S. O., Andreevna, P. N., Mikhaylovna, B. N., Yuryevna, K. G., & Vladimirovna, P. J. (2020). Development of digital intelligence among participants of inclusive educational process. Propósitos y Representaciones, 8(SPE2). http://dx.doi.org/10.20511/pyr2020.v8nSPE2.675

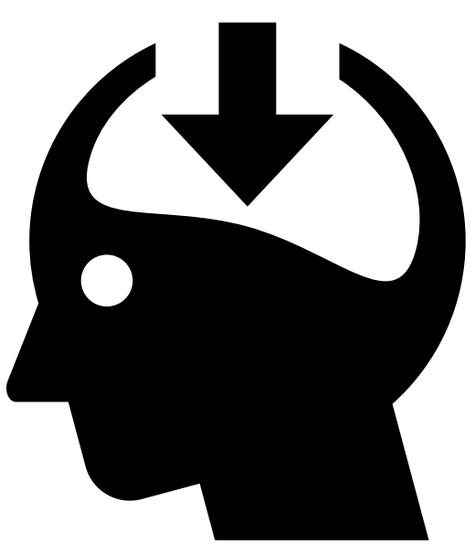
Learning Unit 3

Digital Learning Leadership for the Primary School Community

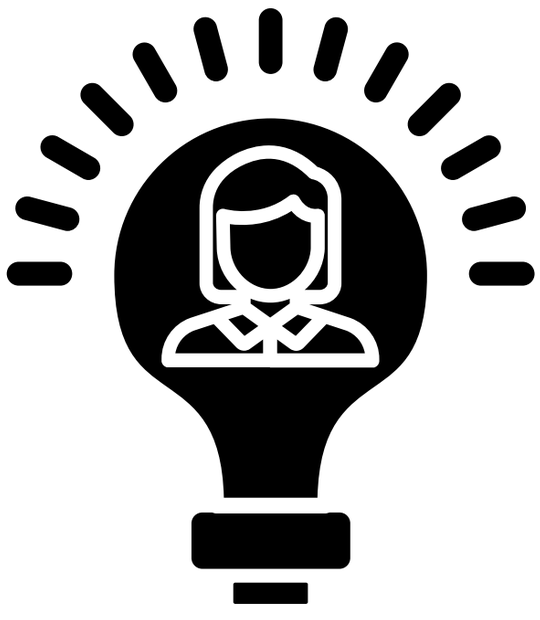
Daniela Herrera Rubalcaba, Pablo Pumares Fernández & María Jesús Cabezón Fernández

Content I

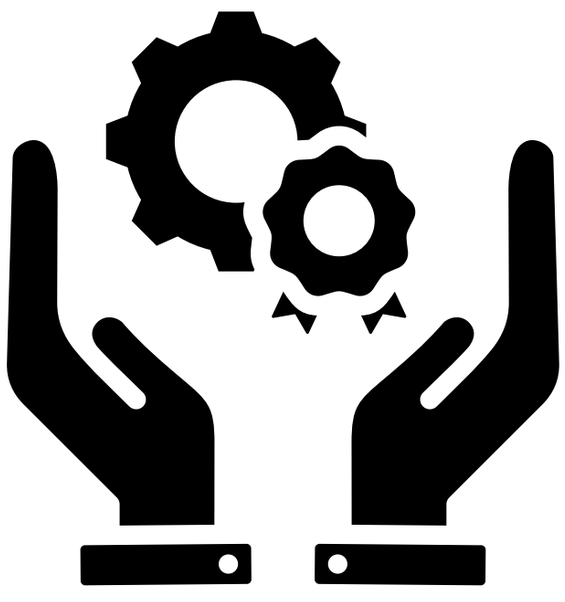
Introduction: Learning objectives



To know what digital learning leadership is.



To understand how to develop a shared vision and goals for Digital Learning in your school.



To be able to redefine your Leadership role in order to promote the school community's digital involvement

CONTENT II

Approach to the digital learning leadership concept in the primary school

Main considerations

It is first necessary to distinguish what is the main difference between...

SCHOOL MANAGER VS. SCHOOL LEADER

"MANAGING a School is making other do, while LEADING a School is making others want to do".

WHAT DO WE MEAN BY SCHOOL LEADERSHIP?

SCHOOL LEADERSHIP: is considered to be the work to mobilize and influence others in order to articulate and achieve the aims and shared vision at the School (Leithwood & Riehl, 2009)

WHO ARE THE SCHOOL LEADERS?

SCHOOL LEADERS: (or educational leaders) are not only school administrators in general but also school teachers.

TYPES OF SCHOOL LEADERSHIP

INSTRUCTIONAL LEADERSHIP: emphasizes the importance of the organizational and environmental context in order to get good students results. It also considers that the principals´ role is key in this regards (Heck et al., 1991).

TRANSFORMATIONAL LEADERSHIP: the school (and not the principal) is the center of educational change (Heck et al., 1991). The point is that an organization will not learn as long as it continues to promote the dependency on a person (Bolívar, 2001). (*) This vision has a strong connection with the Pedagogical Leadership approach. A concept we will develop in the following slides.

LEARNING-CENTRED APPROACH LEADERSHIP: This approach integrates instructional and transformational dimension of leadership (Lewis & Murphy, 2008). It can be described as "all that set of activities carried out by the principals that have relationship with the improvement of the teachers & students' learning processes".

- Digital technology is at the core of the ***21 Century skills*** as a main challenge for classrooms and schools.
- In parallel, the ***COVID-19 crisis*** has made school leaders encounter new challenges and it has delivered the need for principals to be educational leaders and not only administrators in order to involve and support the school community in the use of Digital technology to improve learning.

After previous considerations...

WHAT DO WE MEAN BY DIGITAL SCHOOL LEADERSHIP?

DIGITAL SCHOOL LEADERSHIP: is the educational leaders capacity of developing strategies to benefit from Digital technology in order to improve in-person and virtual education.

- One of the challenges schools principals face is to develop a better understanding of the competencies required for digital leadership. Facing this challenge will ensure that teachers have the resources needed to help students´ basic skills development for their integration into a democratic society
- In this line, there are several gaps between the integration of principal´s digital leadership with the implementation of technology by teachers (Alajmi, 2022). Because of this lack of information and digital technology competency many learners do not benefit from digital literacy in order to have an optimum academic performance. This poor integration of digital technology in schools could be linked to low leadership (Ugur & Tugba, 2019)

EUROPEAN FRAMEWORKS AS MAIN TOOLS FOR SCHOOL LEADERS

1

EUROPEAN FRAMEWORK FOR DIGITALLY COMPETENT EDUCATIONAL ORGANISATIONS - DigCompOrg

It helps educational institutions on how to manage their organizational strategies to improve their capacity for innovation and gain the full potential of digital technologies content

CLICK HERE

2

EUROPEAN FRAMEWORK FOR DIGITAL COMPETENCE OF EDUCATORS: DigCompEdu

It indicates School leaders the digital competences that teachers need to develop

CLICK HERE

3

DigComp 2.2: THE DIGITAL COMPETENCE FRAMEWORK FOR CITIZENS

It helps school leaders to know what digital skills their students need develop during their phase of schooling

CLICK HERE

HOW DIGITAL TECHNOLOGY CAN IMPROVE LEARNING IN PRIMARY SCHOOLS?

The importance of the School Pedagogical approach *when implementing the school Digital Plan*

- Although schools are making big efforts to incorporate digital technology in their classrooms, there is evidence that in most cases this integration is not being completely effective (Fernández Cruz et al., 2018)
- The main reasons are the fact that teachers still lack the skills needed to use digital technology in the classroom and the fact that there is a clear imbalance between the use of technological resources within and outside the schools
- In order to improve digital integration, it is necessary to implement long-term structured projects that have an impact not only on infrastructure and resources, but also on plans for techno-pedagogical training, methodological innovation, leadership, management and coordination

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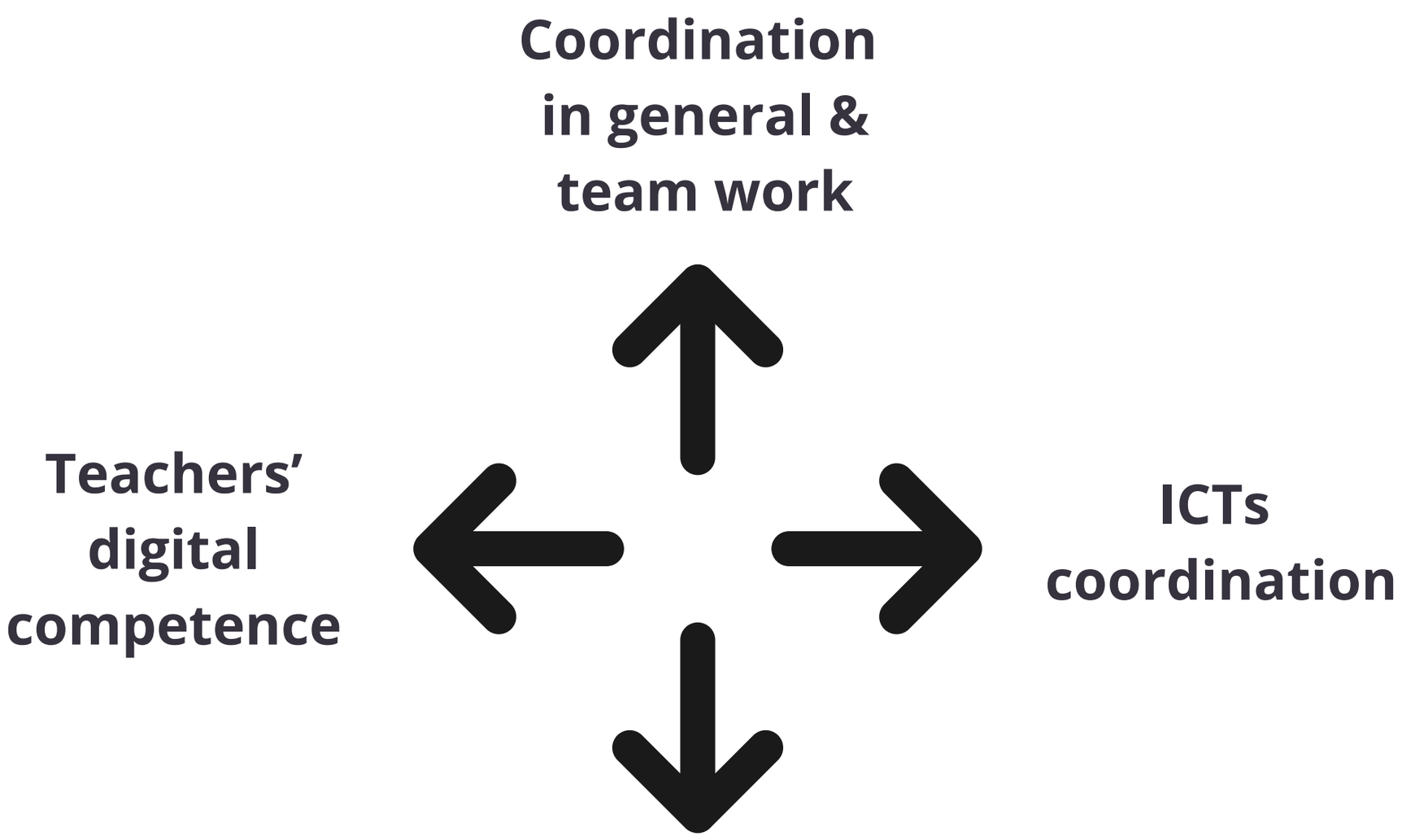
4 KEY ASPECTS THAT AFFECT THE PROCESS OF TECHNOLOGY INTEGRATION IN A SCHOOL COMMUNITY



Source: García-Valcárcel & Tejedor (2012)

The presence of technologicalinfraestructure & resources is notenough to ensure a **real integration of digital technology** in schools and in the classrooms

It’s necessary to overcome the tradicional visionon leadership and integrate programs focused on teacher training programmes capable of improving the **pedagogical** & innovation strategies in the school

Schools need to have a strong Digital Project that integrates its pedagogical and digital vision and such Project should be integrated and led by the principal and the school leadership team to ensure its successful implementation

PEDAGOGICAL LEADERSHIP TO REACH EFFECTIVE DIGITAL SCHOOL LEADERSHIP

Pedagogical leadership

- Common vision assumed by the principals and the School Community focused on the learning improvement
- Collaborative work dynamics
- Exchange of knowledge and skills between school leaders
- Effective transformation of attitudes, motivations and behaviours
- Subordination of administrative management tasks
- Management shared with the rest of the school staff

Pedagogical leadership enables the rest of the school staff "get involved in"

VS

Traditional leadership

- Individual who occupies a formal position of authority
- Focused on administrative tasks and normative compliance
- Management functions that consume most of their time
- Top-down decision making

Traditional leadership places all the responsibility in one person

Digital technologies can improve the learning processes through the innovative teaching materials and more active and efficient teaching methodologies (Gerwerc, 2022)

"Digital technology as a means to an end, not as an end in itself"

For this it is necessary:

- **Principals and teachers** should cooperate to solve the problems sharing the responsibility of achievements and failures
- They should **share knowledge** and solutions to individual and collective problems related to teaching and learning processes
- They should **share decision making** in order to redistribute power and authority and improve school performance
- Principals must create **favourable work environments** for learning
- Principals should **facilitate structures**, times and spaces to help school staff develop their *digital competence*

Following previous considerations...

WHAT WE MEAN BY DIGITAL PEDAGOGICAL LEADERSHIP?

DIGITAL PEDAGOGICAL LEADERSHIP: look for a shared vision of responsibility (not only for occupy a lead position) in where the whole educational staff has influence and a proactive role in its respective areas of work. Being a digital pedagogical leader implies address the digital perspective and tools from pedagogical leadership approach in order to give the students the better learning.

CLICK HERE

5 BASIC PRINCIPLES OF LEADERSHIP APPLICABLE IN THE DIGITAL LEARNING CONTEXT

suggested by The International Society for Technology in Education (ISTE) (AlAjmi, 2021, p.2-3:)

1

Excellence in Professional Practice: Excellence in learning and teaching means to have a strong awareness of the content that needs to be taught and delivered to learners (Christopoulous *et al.*, 2021). Teachers should also bear the needed pedagogical competencies to ensure that skills are conveyed to learners. School leaders should promote a conducive environment for innovation and professional learning, aimed at enabling students to learn through digital and technological resources.

2

Visionary Leadership: it focuses on the integration of a clear vision by the digital leader in terms of where they want to direct their organization. This vision improves the efficiency of decision-making processes. Digital leadership also improves school´s principals awareness and understanding of existing problems. In this sense, Educators must stay updated on current technology trends not only to communicate but also to articulate the visión of leadership and developement with the stakeholders (Botham, 2018). School leaders have to create and maintain the resources and connections that are required in the age of digital learning; implementing the shared vision of integrating technology in view of promoting school transformation.

3

Digital-age Learning Culture: educators now have to maintain technology use as a major learning resource. School leaders should create, facilitate, and sustain the dynamic digital age through a learning culture that embraces modern digital platforms and developments (Figueiredo, 2021). This well embracement of the digital-age learning culture will have an impact in the future. For these reasons, leaders have to ensure that educators are adequately aware of the strategies that constitute the framework of implementing a digital age learning culture within their respective settings or organizations.

4

Digital citizenship: it reflects the actions and consumption habits that target positive digital communities and contexts. When evolving digital culture and citizenship, principals take responsibility for modeling and mobilizing the understanding of ethical, legal, and social responsibilities. Digital citizenship involves embracing computer science, technological platforms, and the different trends that characterize digital development (Mihardjo & Alamsjah, 2019). The integration of digital citizenship into digital leadership improves the extent to which leaders can connect effectively with the needs of different stakeholders while also staying in touch with emerging trends and developments, both from within and externally.

5

Systemic improvement: A leader should manage continuous improvement in their school, and to accomplish this, they should manage resources and technological information effectively. School principals must be in charge to ensure that infrastructure fully supports both learning and teaching integration (ISTE, 2014).

CLICK HERE

See **Unit 2** for more info about digital intelligence

CONTENT III

Crisis & conflict management in the school community

"The **'transboundary'** nature of the COVID-19 pandemic has enriched the crisis definition, describing it as a situation that reaches across multiple domains with multiple manifestations; has a slow incubation but a rapid escalation; has causes that are hard to chart; challenges multiple actors who share conflicting responsibilities; and has no ready-made solutions" (Boin, 2019).

What is a CRISIS within the context of a school?

"**Crisis** can be regarded as any urgent situation that requires the school **leader** to take fast and decisive action" (Pearson & Clair, 2008:60).

5 types of school-based crisis (Smith & Riley, 2012)

1.Short term crisis: ones that are sudden in arrival and swift in conclusion

2.Cathartic crisis: ones that are slow in build-up, reach a critical point and then can be swiftly resolved

3.Long-term crisis: ones that develop slowly and then bubble along for a very long time without any clear solution

4.One-off crisis: ones that are quite unique and would not be expected to recur

5.Infectious crisis: ones that occur and are seemingly resolved quickly, but leave behind significant other issues to be addressed, some of which may subsequently develop into their own crisis

For a good handling of these types of crises, **school´s principals & educational leaders (all school community)** should operate:

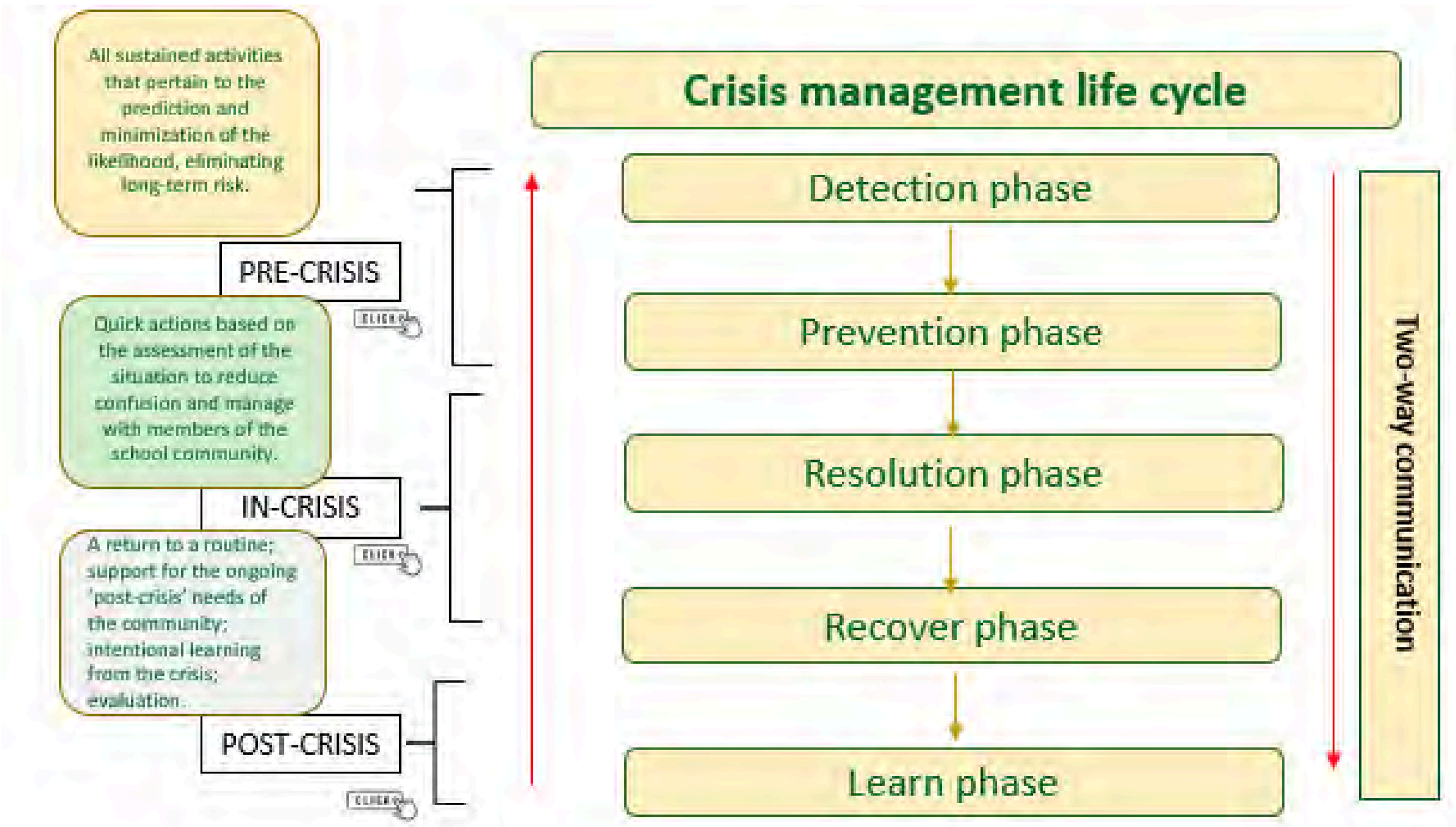
- Providing certainty and engendering hope
- Engaging a rallying point for effective and efficient effort
- Ensuring an open communication for all school community members

Handling crisis with these ***skills*** "would allow schools leaders to accurately assess the complexity of the situation, engage with effective decision-making, establish communicative lines with all interested stakeholders, employ recovery strategies upon termination of the crisis and adopt self-reflection on the valuable lessons learned during crisis as a guide for the resolution of future crises" (Chatzipanagiotou & Katsarou, 2023).

Gainey (2009) suggests as more appropriate for use in educational settings:

1) a cyclical approach to crisis management (allow reflection during a crisis);
2) an open two-way communication for decision making that minimizes misinformation.

Such an approach is usually divided into five stages:



Cyclical model of crisis management strategy. Source: Elaborated by CEMyRI, data from Smith &Riley (2012).

Source: Grissom's & Condon's framework (2021)

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WHEN A CRISIS COMES...

Importance of establishing a **LONG-TERM ACTION PLAN**. This Plan should be realistic; it must incorporate clear priorities and measurable objectives in order to check if they have been achieved

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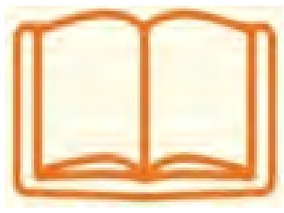
In case of a **NEW CRISIS**, this Plan should be centered in an ***Online Education***

Follow: **SCHOOL DIGITAL PLAN**: It will help to improve the teaching-learning process through the use of digital resources



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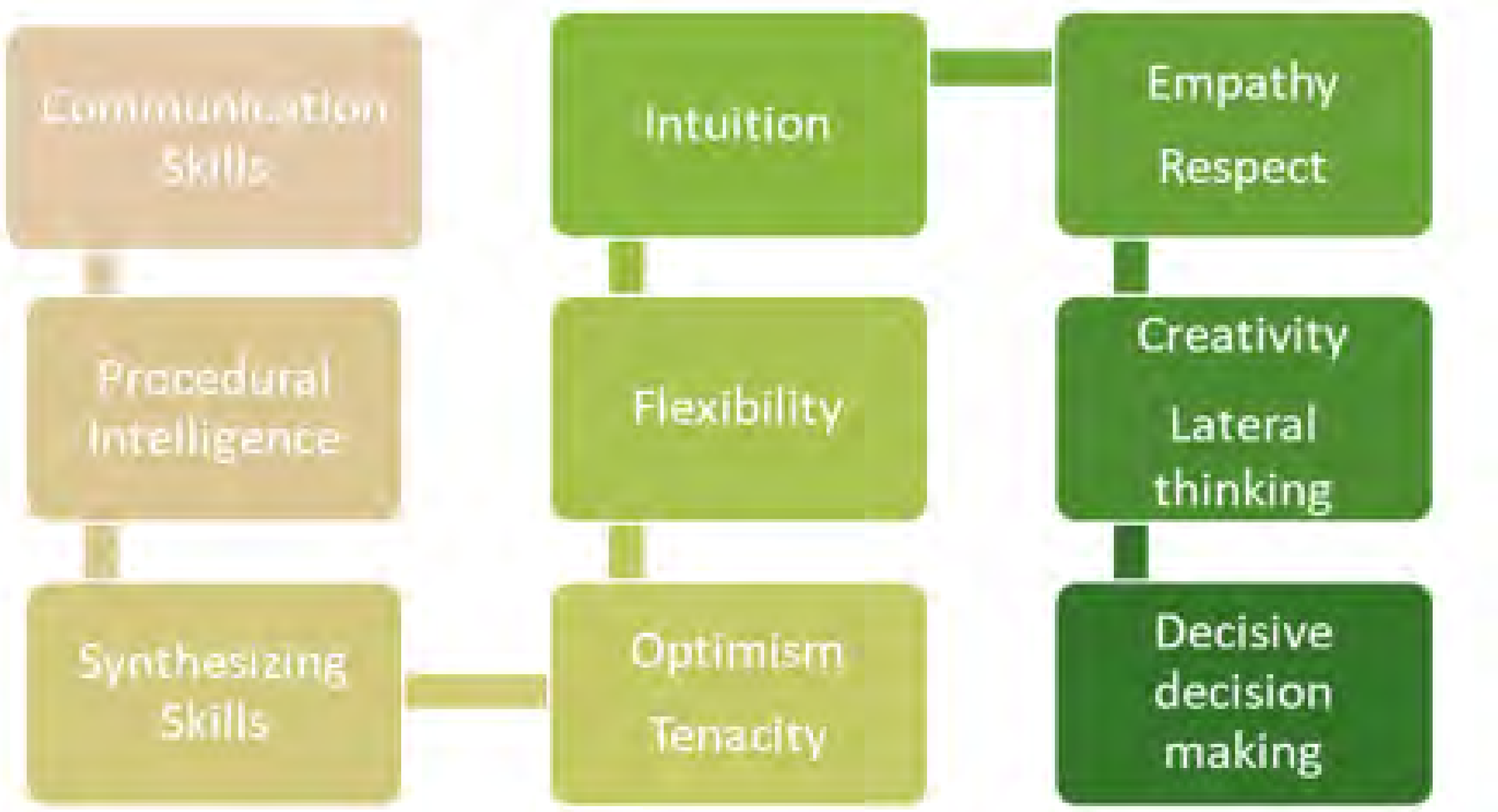
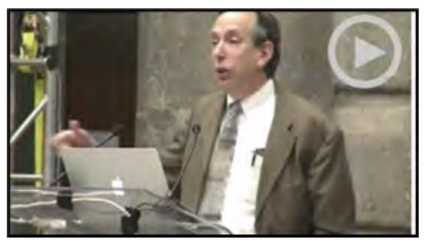
9 KEY ATTRIBUTES IDENTIFIED FOR THE SCHOOL'S PRINCIPALS & EDUCATIONAL LEADERS TO EFFECTIVELY MANAGE FUTURE CRISES



Source: Elaborated by CEMyRI, data from Smith & Riley, 2012, in Chatzipanagiotou and Katsarou (2023).



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HOW TO MANAGE A CONFLICT IN THE CONTEXT OF A SCHOOL?

"When we talk about augmented we refer to differences between people who can be resolved in productive, stagnant, polarized, or porital ways"
(Fried Schnitman, 2011)

- School leaders are expected to handle successfully the issue of school conflict
- Successful management intervention may not eliminate conflicts, but a good leader can increase the positive outcomes
- Conflict may result from differences of opinion, values, and feelings in the workplace
- Conflict in schools can be augmented by personal or organizational parameters but are leaders who set the tone for conflict management (their work experience and perceptions can moderate their priorities and strategies during the conflict)

- **The leadership style adopted** by the school leader can be **critical** for a successfull outcome
- School leaders may adopt **different leadership styles**

The school leader **role includes:**

1- Support to teachers, students and parents

2- Liaising with parents and other stakeholders

3- Handling with internal and external school variables

Source: Figure elaborated by CEMyRI, data from Chandolia & Anastasiou (2020)

DIGITAL RESISTANCE IN THE SCHOOL COMMUNITY

Digital resistance at the school can be described as the rejection by some members of the school community of incorporating digital tools in the learning process, causing barriers to the digitization of the center. Digital resistance is a clear example of a **school conflict.**

- European Commission (2018) establish **Digital Competency** as a key concept to be developed by all citizens in order to participate actively in the society today
- At European level, the **Digital Education Action Plan (2021-2027)** established two priorities that affect educational field: Digital technology should be integrated in the Schools and adapted to the students' needs
- This integration should facilitate School Leaders an efficient knowledge acquision in order to change traditional teaching paradigms as quickly as posible

CASE STUDY 1: DIGITAL RESISTANCE IN THE SCHOOL CONTEXT (FROM FAMILIES)

A short story from the field

"I was more than three years behind several families to get them to accept the digitization of the center. The causes of this opposition had to do, firstly, with the fact that their children would be many hours connected, on the other hand, that the acquisition of a digital device implied a very big responsibility in case of loss, breakage or that it would have a high cost" - School Principal in Madrid.

What is the point

This director explains the digital resistance presented by some families of the school despite the fact that from the institution various strategies were adopted such as including digital books in the ACCEDE Plan so that the materials have zero cost as they do not have any type of license. Or establishing agreements with companies so that families have the electronic device with payment facilities and that it is replaced in case of loss or damage. It was also explained to them that this tool would have a useful life of 12 years, so it also represented an opportunity for the student to learn about responsibility. Finally, long-term awareness campaigns were established with the parents on the importance of digitizing the center.

Some questions for reflection

As a leader, have you ever had to deal with similar situations? What solution have you found?

CASE STUDY 2: DIGITAL RESISTANCE IN THE SCHOOL CONTEXT (FROM STAFF)

A short story from the field

"From the moment I started to train the various educational leaders and teachers on the use of technological tools in the classroom I found great resistance among the older staff who were opposed to changing their usual work methodology, which indicated a great fear of the unknown, of not knowing how to manage new devices in the classroom and of making a fool of themselves“- School Principal in Madrid.

What is the point

This principal exposes a clear example of digital resistance among the teachers of her center that highlights the fear of the paradigm shift and not knowing how to deal with digital natives in the classroom in the face of possible questions. To solve this attitude, not only training courses were carried out, especially after the pandemic caused by the COVID-19, but also groups were created within the teaching staff capable of infecting the rest on how to work so they can feel supported.

Some questions for reflection

Have you encountered resistance to the adoption of digital tools among your own co-workers? Could you describe them? What solution has been given?

HOW TO ADDRESS CASES OF DIGITAL RESISTANCE AT SCHOOL

CONTENT IV

Models and practices of digital leadership

HOW DIGITAL TECHNOLOGY COULD BE USED TO IMPROVE PEDAGOGICAL AND KNOWLEDGE PRACTICES?

- In some countries as UK, the approach has been hierarchical top-down, whereas in the ***Nordic countries***, the emphasis is on ***democracy***, giving schools and teachers responsibility for the improvement (Sahlberg 2011; Wrigley 2003).
- In this sense, mutual trust, willingness to engage in open communication with the participants, teachers' shared values and visions, which focus on student learning, and collaborative knowledge-sharing are critical for continuous growth of both teachers and schools (Ilomäki & Lakkala, 2018).
- ***School leadership*** is best understood as a ***distributed practice***. For this, the role of the schools principals is essential (Ilomäki & Lakkala, 2018) in order to create suitable conditions for innovation processes and in leading these processes (Jong, et.al, 2022).

NATIONAL & INTERNATIONAL MODELS AND PRACTICES OF DIGITAL LEADERSHIP IN PRIMARY SCHOOLS

MODEL 1: Estonia #1 in Europe for digital leraning

Strong digital focus

School in mostly in the cloud

CLICK HERE

"Since 2014, Estonians have a lifelong learning strategy that includes also a digital transformation programme. The idea of the programme is to help develop the digital competencies of both, the teachers and the students."

See also: **Digital Competence: Empowering teachers and students**

CLICK HERE

THE ESTONIAN TEACHERS' DIGITAL COMPETENCE FRAMEWORK IS ADAPTED FROM **DigCompEdu** 2019 AND IT HAS **SIX DIMENSIONS**:

1. **Professional development and engagement** (i.e., communication, co-operation, reflection and professional development using digital technologies).
2. **Digital resources** (i.e., choosing, creating and sharing digital learning materials).
3. **Teaching and learning** (i.e., managing and using digital technologies in teaching and learning).
4. **Assessment** (i.e., using digital technologies to enhance learning).
5. **Empowering learners** (i.e., using digital technologies to actively engage learners, to support differentiation, individualisation, and the development of learners' general competences/skills).
6. **Facilitating learners' digital competence** (i.e., supporting students in developing the competences described in the next slide).

CLICK HERE

See also: **How did Estonia become a new role model in digital education?**

MODEL 2: FINLAND #1 IN EUROPE FOR DIGITAL LEARNING

CLICK HERE

Finnish ***digital leadership model*** evidence that "the addition of educational technology in supplementary projects cannot only improve cognitive skills likereasoning, attention and problem-solving but canalso equip students with additional non cognitive skills like motivation, collaborative learning and creativity which are all deemed vital aspects for future careers" (Lander, 2019).

See also: **Marking the "digital leap" in Finnish schools**

CONTENT V

Guidance on how to enhance the educational leaders on the learning of digital leadership

In order to reach a successful **school digitalization**, it is necessary educational leaders (school principals, teachers and intermediate positions in general) to become **digital Leaders**.

LEADERSHIP OF THE DIGITAL PLAN AT THE SCHOOL LEVEL

Educational leaders will be in charge of **accompanying and guiding the inclusion of digital technologies** in the school. This guidance will be reached through a methodological (sharing practices, favoring openness between classrooms, recognizing the initiative and talent of teachers) as technological approach.

DEVELOPMENT OF SCHOOL TEACHERS DIGITAL COMPETENCE

In order to lead the inclusion of technologies at the classroom level, there will be a need for the **teacher implication**. For this reason, they should be listened & valued. It is necessary recognize its initiatives and provide the with resources to easy **develop their digital skills** (through training, visits to other schools, collaborative work between colleagues).

PRACTICE ACTIVE LISTENING & CONSULTATION WITH FAMILIES

It is necessary to develop active listening competence that allows us to take into account families' needs and proposals to be able to integrate them into the programming of the school or to develop parallel non-formal actions that favor achieving this objective.

STUDENTS AS THE PROTAGONISTS OF DIGITAL CHANGE

The aim is **students to learn how to use digital technology with skills and competences,** from a critical, civic and ethical point of view that allows them to make the world a better place.

HOW TO PROVIDE MEANINGFUL GUIDANCE TO THEIR SCHOOL'S TEACHING STAFF IN THE LEARNING OF DIGITAL LEADERSHIP?

- Give technological resources an efficient use in order to extract the maximum potential (technology is really expensive when bought, and not used)
- Transmit your colleagues the positive side of digital technology and its well functioning
- Share good practices in your school. Principals should design moments and spaces wherein the staff could share their failures and successes from their digital experiences in the classroom
- Involve and give prominence to families in digital. School principals should implement small workshops to encourage digital competence of families. Some of those workshops can even be taught by the students themselves
- Be open to organise frecuently online meetings with other schools in order to know other experiences, experts and promove dialogue with students
- Take advantage of the technologies for customizing the didactic plan for each student ensuring that he/she plays an active role
- Take advantage of the technology versatility to foster inclusion. Break the physical, sensory, cognitive and cultural barriers that exist in the classroom to promote real inclusion that involves all students, and not just those with different abilities

TOŁWIŃSKA (2021), ALSO DEFINES TWO PRICIPALS ACTIVITIES GROUPS TO SUPPORT TEACHERS IN THE USE OF DIGITAL TECHNOLOGIES:

A. Ensuring Digital technology (DT) infrastructure

1.Give teachers best conditions possible for carrying out the educational process

2.Provide with the equipment for the schools (computers, laptops, tablets, multimedia whiteboards and projectors, software, Internet connections) not only in IT classrooms but in all classrooms

B: Promote culture of cooperation to develop Digital Technology (DT)

1.Vision oriented at a change in the mental model of the student, the teacher and the objectives of the didactic process (giving a new direction to pedagogical work; engaging teachers in discussions on the need to change the didactic methods, to depart from lecturing to more active forms of teaching, students need an active role in the educational process, using digital technologies helps to activate them; students learning from teachers and the other way round)

2.Knowledge sharing with the aim of facilitates collaboration; elimination of individual work and teachers' isolation (enabling teachers to improve DT skills e.g., exchanging materials, open lessons, initiating team learning)

3.Support innovation, encourage teachers risk-taking, arousing positive thinking, elimination of the fear of failure

4.Caring for the needs of all students, especially those from disadvantaged circles. The principal should act as the "first learner", revealing problems, looking for solutions, and using the teachers' potential (providing a good model for the other teachers)

CLICK HERE

CASE STUDY 3: DIGITAL LEARNING LEADERSHIP WITH ATTENTION TO DIVERSITY

A short story from the field

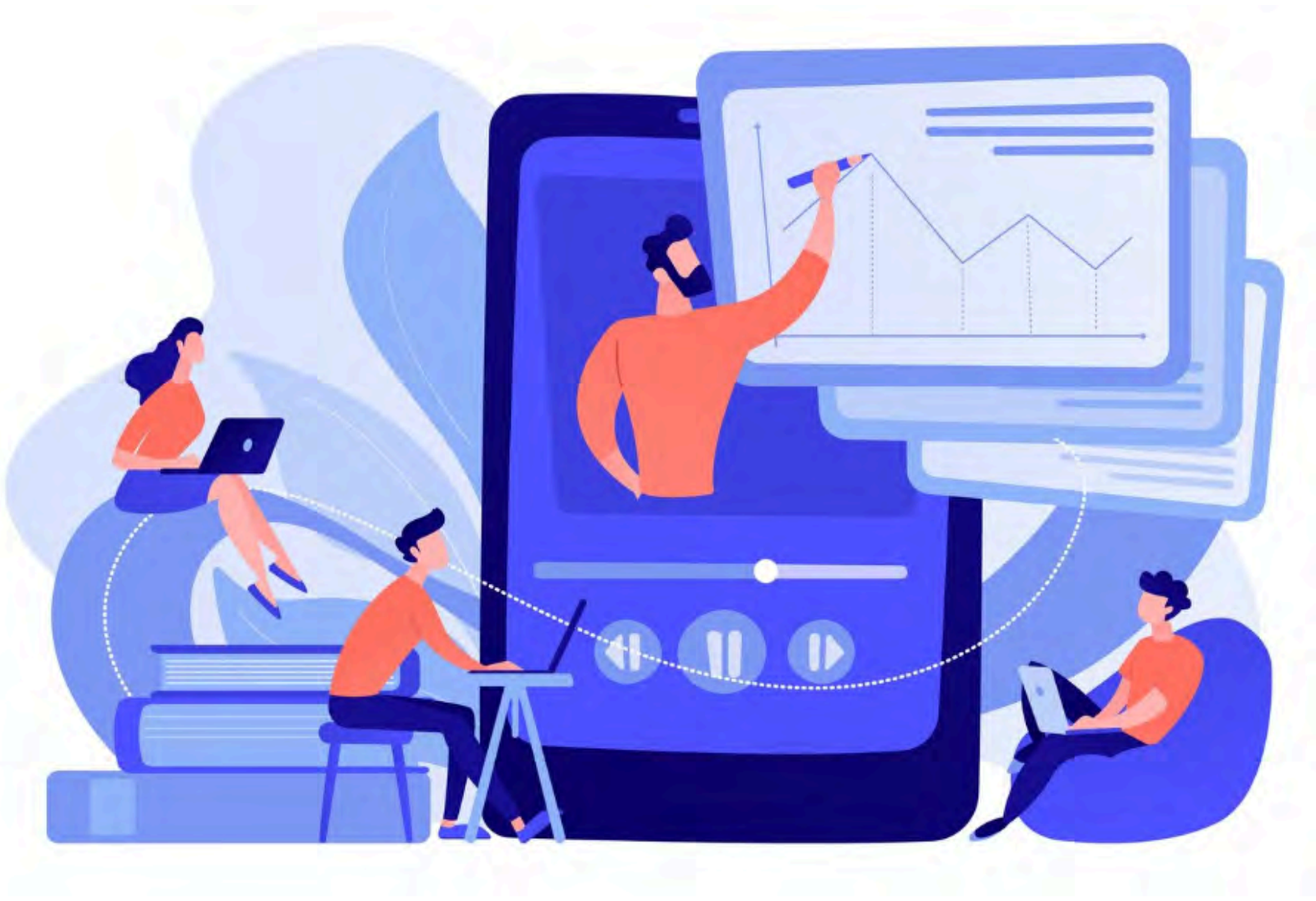
"Once we came across the case of a student who could not type on the keyboard because of a hand disability and some delay and he needed a specific tool that I called him " pen". In spite of adapting the Tablet for him we realized that he needed a tutor, an external help on the side to be able to handle that technology. We couldn't solve it with a voice command either" - School Principal in Almeria.

What is the point

This principal exposes a clear example of how, at times, technology does not always get to meet all the educational needs of diverse students. A digital leadership approach is crucial to deal sensitively with these cases, especially in times of pandemic, when they lose all personal contact with specialists.

Some questions for reflection

Have you encountered resistance to the adoption of digital tools among your own co-workers? Could you describe them? What solution has been given?



Q&A

1.What is the Pedagogical Leadership approach necessary for good digital learning leadership?

a) Pedagogical leadership promotes a shared vision of school management

b)Pedagogical leadership promotes the involvement of the school community in school issues

c) Both are correct

2. The main traditional vision od leadership is characterised by...

a) Establishing collaborative work dynamics between the staff to make decisions

b) Delegating all the responsibility in one person: Top-down decision making

c) Delegating administrative tasks in order to focus on other issues

3. What are the skills that better identify an effective educational leader managing a crisis?

a) Demanding their staff perfect results

b) Providing short autonomy to their staff in order to make better decisions

c) Being emphatic, communicative and flexible

4. What is the role of families in digital learning?

a) None. Families should keep in a secondary role in the educational digital transition

b) An intermediate role

c) An active role with, with a participatory vision, where promotes critical thinking

5. What were the main challenges faced by school leaders throughout the COVID-19 pandemic?

a) Educational leaders didn't have the skills needed to use Digital technology in the online classroom

b) Lack of information and communication technology

c) Both are correct

6. Why might some members of the school community consider Digital technology an obstacle ?

a) Lack of digital training makes educators not feel confident in digital contexts

b) Many families had unequal access to digital technology

c) Both are correct

BIBLIOGRAPHY

AlAjmi, M. (2022). The impact of digital leadership on teachers´technology integration during the COVID-19 pandemic in Kuwait. *International Journal of Education Research*, 112, 101928. https://doi.org/10.1016/j.ijer.2022.101928.

Bolívar, A. (2015). The comprehensive school in Spain: A review of its development cycle and crises. *European Educational Research Journal*, 14(3-4), 347-363. https://doi.org/10.1177/1474904115592496

Botham, K.A. (2018). The perceived impact on academics´teaching practice of engaging with a higher education institution´s CPD scheme. *Innovations in Education and Teaching international*, 55 (2), 164-165.

Chatzipanagiotou, P., & Katsarou, E. (2023). Crisis Management, School Leadership in Disruptive Times and the Recovery of Schools in the Post COVID-19 Era: A Systematic Literature Review. *Education Sciences*, 13(2), 118. MDPI AG. Retrieved from http://dx.doi.org/10.3390/educsci13020118

European Framework for Digitally Competent Educational Organisations: https://joint-research-centre.ec.europa.eu/european-framework-digitally-competent-educational-organisations-digcomporg_en

Ferrari, A., Punie, Y. & Redecker, C. (2012). Understanding digital competence in the 21st century: An analysis of current frameworks. A. Ravenscroft *et al*. (Eds.): EC-TEL 2012, LNCS 7563, pp. 79–92.

Fernández Cruz, F.j.; FernándezDíaz, M.J. yRodríguez Mantilla, J.M.(2018). El proceso de integración y usopedagógico de las TiCenloscentroseducativosmadrileños. *Educación XX1*, 21(2), 395-416, doi: 10.5944/educXX1.17907

Kampylis, P., Punie, Y. & Devine, J. (2015). Promoting Effective Digital-Age Learning: A European Framework for Digitally-Competent Educational Organisations, Publications Office of the European Union, Luxembourg, doi:10.2791/54070, JRC98209.

Leithwood., K. & Riehl, C. (2009). ¿Quésabemossobreliderazgoeducativo? En K. Leithwood (Ed.) ¿Cómoliderarnuestrasescuelas? Aportesdesde la investigación, pp. 17-33, Santiago de Chile: Fundación Chile.

Moos, L. & Huber, S. (2007). School leadership, school effectiveness and school improvement: democratic and integrative leadership. In International Handbook of School Effectiveness and Improvement, Springer, pp. 579-595.

Redecker, C. (2017). European Framework for the Digital Competence of Educators: DigCompEdu, EUR 28775 EN, Publications Office of the European Union, Luxembourg, doi:10.2760/178382 (print),10.2760/159770

Ugur, N.G., & Tugba, K. (2019). Leading and teaching with technology: School principals perspective. *International Journal of Education Leadership and Managemen*t, 7(1), 42.

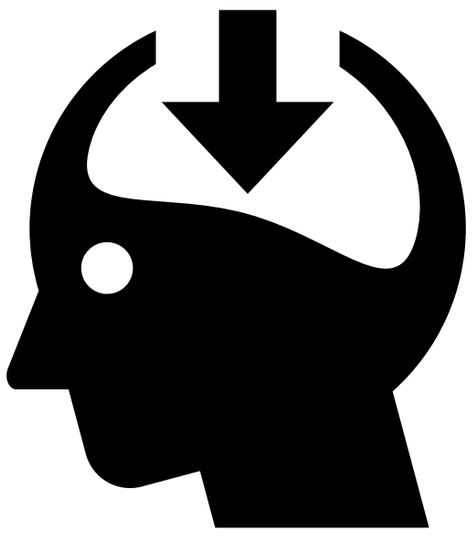
Learning Unit 4

Accessing and Maintaining Digital Infrastructure for All

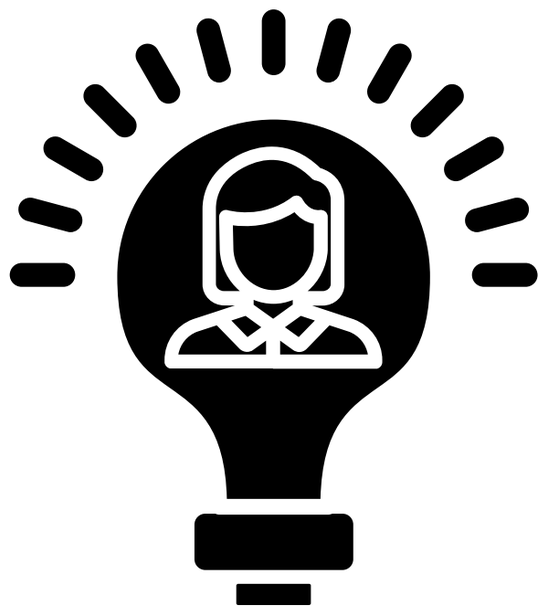
Joanna Bać & Małgorzata Nazimek

Content I

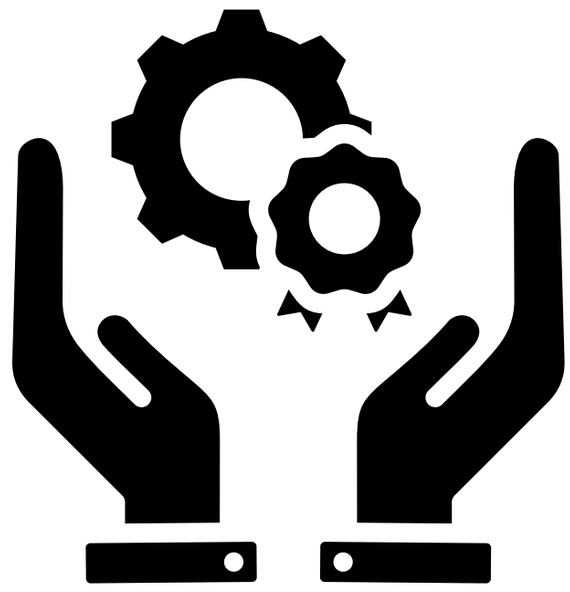
Introduction: Learning objectives



To know the available hardware and software infrastructure in relation to digital education platforms and tools in primary schools.



To understand the basic principles of evaluation and management of the available educational technologies.

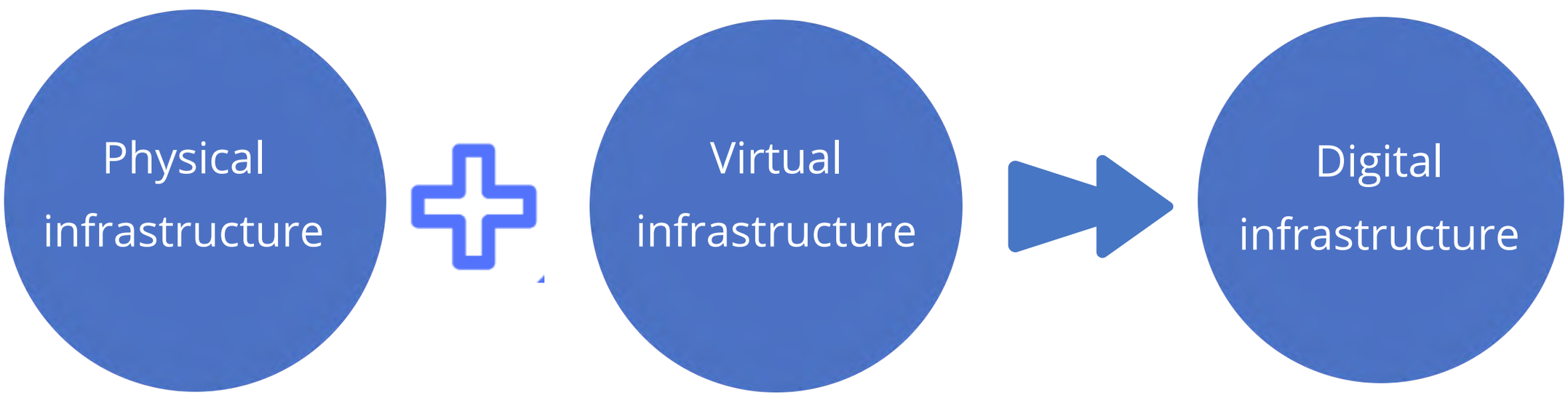


To be able to claim the appropriate digital infrastructure for their own school community. Also to be able to observe the digital learning infrastructure in your school community.

CONTENT II

Definition of digital infrastructure

Digital infrastructure refers to the underlying technological components and systems that enable the storage, processing, transmission, and access of digital information. It encompasses a wide range of interconnected physical and virtual elements necessary for the functioning of digital systems, networks, and services. Digital infrastructure includes both hardware and software components, as well as the necessary connectivity and supporting resources.



DIGITAL INFRASTRUCTURE ELEMENTS

Digital infrastructure can be broadly categorized into two main components: physical infrastructure and virtual infrastructure.

- Physical infrastructure refers to the tangible and visible elements of the digital ecosystem. It includes the hardware, networks, and data centers that form the backbone of digital operations.
- Virtual infrastructure refers to the software and virtualized components that operate on top of the physical infrastructure. It includes the software systems, applications, and platforms that enable the creation, management, and utilization of digital resources.

Physical infrastructure

- **Hardware**
- **Networks**
- **Data centers**

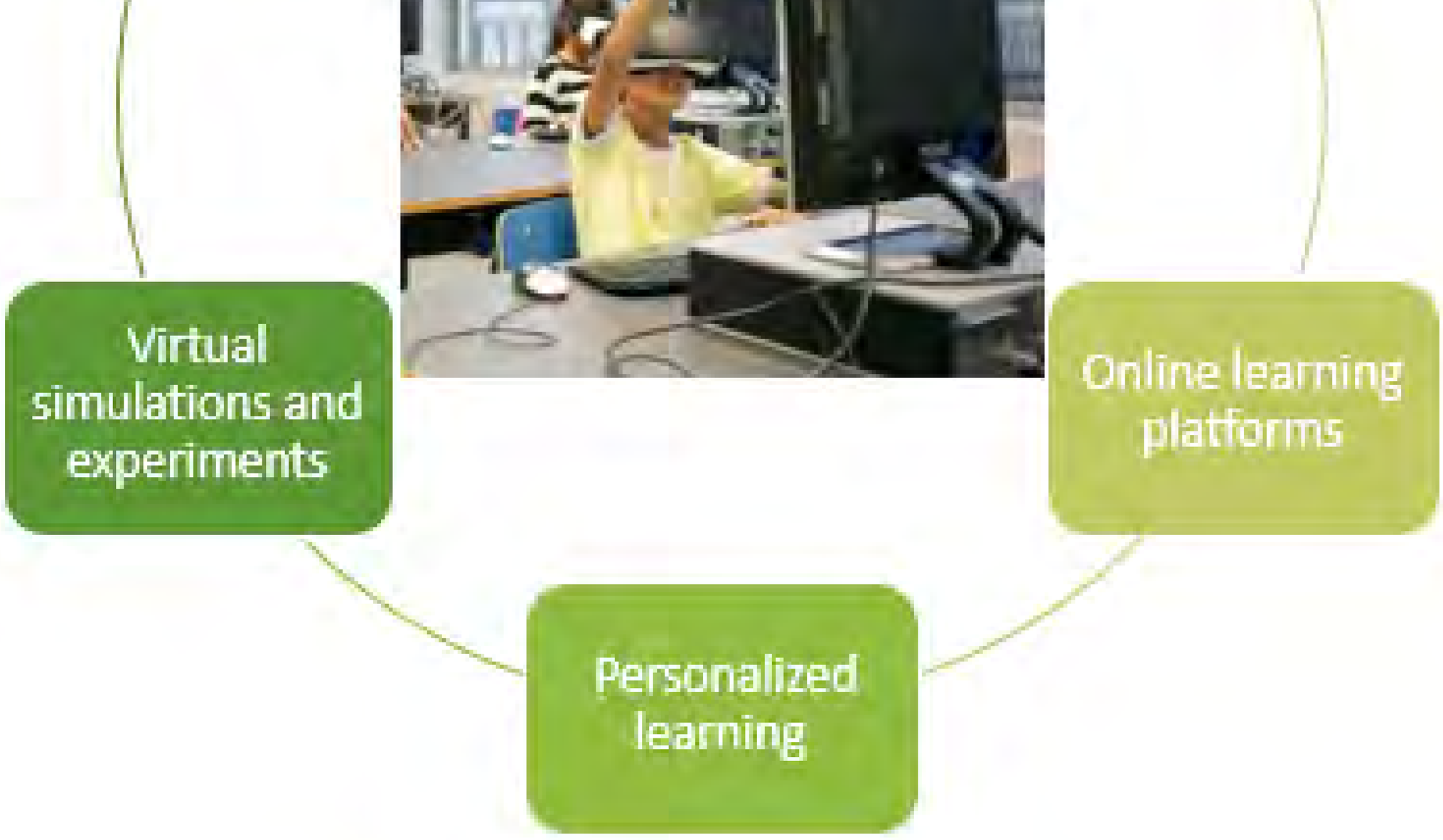
Virtual infrastructure

- **Software systems**
- **Applications and services**
- **Virtualization technology**
- **Cloud services**

These two components, physical infrastructure and virtual infrastructure, work together to enable digital operations, connectivity, and the delivery of digital services and applications. They form the foundation for digital transformation, innovation, and the seamless functioning of the digital ecosystem.

THE USE OF TECHNOLOGY AT SCHOOLS

Technology plays a crucial role in schools, enhancing education in various ways. It facilitates access to information, promotes interactive learning, and prepares students for the digital world. Some common uses of technology in schools include:



While technology has many benefits, it's essential to balance its use with traditional teaching methods and ensure that it is integrated effectively to support educational goals.

BENEFITS OF USING TECHNOLOGY IN SCHOOLS

1.Access to information: Technology provides students with instant access to a vast amount of information and resources, expanding their knowledge beyond the confines of textbooks.

2.Interactive learning: Digital tools and multimedia resources make learning more engaging and interactive, capturing students' attention and promoting better understanding of complex concepts.

3.Collaboration and communication: Technology facilitates collaboration among students and teachers, enabling seamless communication, group projects, and knowledge sharing.

4.Personalized learning: Educational software and platforms can adapt to students' individual needs and learning styles, providing personalized instruction and targeted feedback.

5.Preparation for the digital world: By incorporating technology into the learning process, students gain the digital literacy skills necessary for their future careers and everyday life in a technology-driven world.

6.Efficiency and productivity: Technology streamlines administrative tasks, such as grading and record-keeping, allowing educators to focus more on teaching. It also enhances productivity in research, organization, and content creation.

7.Accessibility and inclusivity: Technology provides tools and resources that accommodate diverse learning needs, making education more accessible and inclusive for students with disabilities or special requirements.

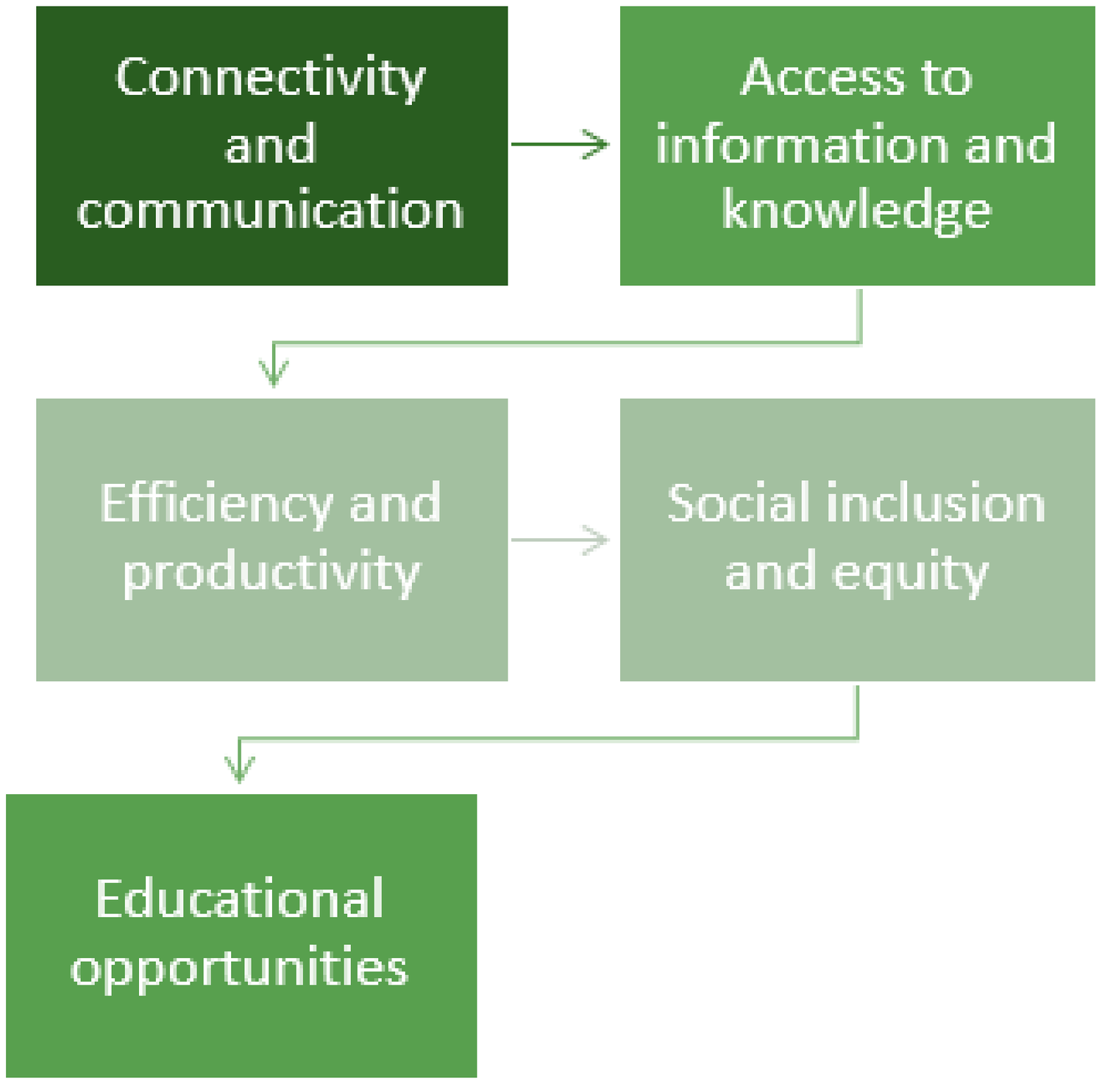
8.Real-world applications: Through virtual simulations, online experiments, and educational software, students can experience real-world scenarios and practical applications of their knowledge, enhancing their understanding and critical thinking skills.

These benefits demonstrate how technology can revolutionize education, making it more engaging, inclusive, and effective in preparing students for the challenges of the 21st century.

See **Unit 1** for more info about inclusive digital learning

DIGITAL INFRASTRUCTURE IMPORTANCE

Digital infrastructure is of paramount importance due to the following reasons:



- It facilitates connectivity and communication between individuals, organizations, and devices. It enables seamless and real-time data transfer, allowing for efficient collaboration, information sharing, and communication across geographical distances.
- It improves efficiency and productivity in various sectors. It automates processes, reduces manual work, and enables streamlined workflows. Digital tools and platforms enhance productivity by providing access to data analytics, project management systems, and cloud-based collaboration tools.
- It provides access to a vast amount of information and knowledge resources available on the internet. It enables individuals to acquire new skills, access educational content, and stay updated with current events, fostering continuous learning, and personal growth.
- It has the potential to bridge the digital divide and promote social inclusion. It provides opportunities for underserved communities to access information, education, and economic resources. Efforts should be made to ensure equitable access to digital infrastructure, minimizing disparities, and promoting digital literacy.

DIGITAL INFRASTRUCTURE FOR EDUCATIONAL OPPORTUNITIES

Digital infrastructure plays a crucial role in enhancing educational opportunities. It enables online learning platforms, virtual classrooms, and digital educational resources, making education more accessible and flexible. It empowers students and educators with tools for research, collaboration, and personalized learning experiences.

HARDWARE

SOFTWARE

When it comes to digital education platforms and tools in primary schools, there are several hardware and software infrastructure components that are commonly utilized. These components enable the implementation and effective use of digital tools for teaching and learning.

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HARDWARE INFRASTRUCTURE

1.Computers and laptops: Primary schools often have dedicated computer labs or classroom sets of desktop computers or laptops. These devices serve as the primary hardware for students and teachers to access digital education platforms and tools.

2.Interactive whiteboards: Interactive whiteboards, also known as smart boards, are large display screens that allow teachers to interact with digital content and present lessons more dynamically. They enable collaborative activities and enhance student engagement.

3.Tablets: Some primary schools provide tablets to students, either on a one-to-one basis or as shared devices. Tablets offer mobility and flexibility, allowing students to access digital education platforms and tools from anywhere in the school premises.

4.Projectors and document cameras: Projectors and document cameras are used to display digital content, including presentations, videos, and documents, to the entire class. They enable teachers to share resources and demonstrate concepts effectively.

5.Networking equipment: Schools require networking infrastructure, including routers, switches, and cabling, to establish a local area network (LAN) within the school premises. This infrastructure enables connectivity and internet access for students and teachers.

SOFTWARE INFRASTRUCTURE

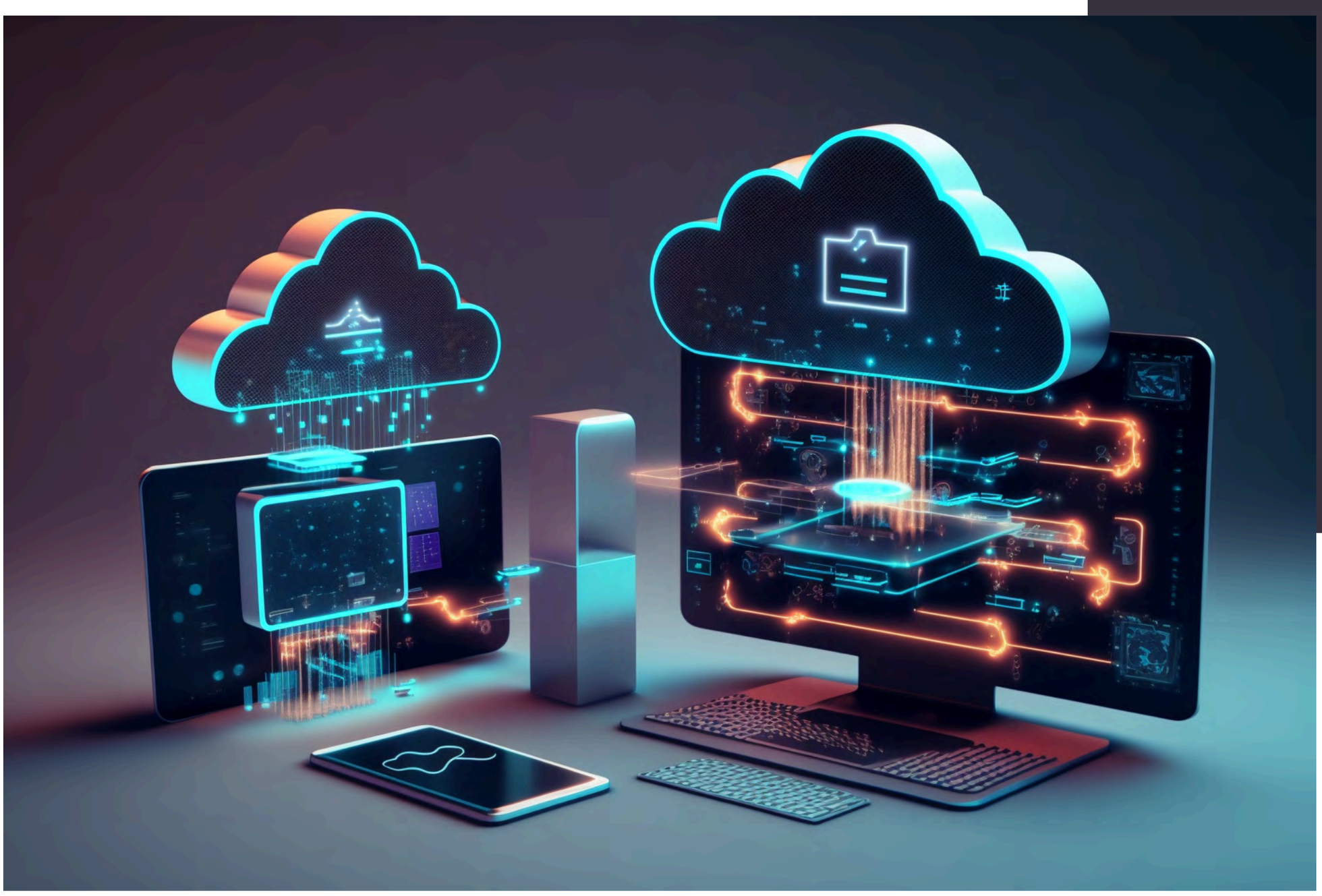
1.Learning Management Systems (LMS): Learning management systems provide a centralized platform for delivering and managing digital educational content. They offer features such as course management, content sharing, assessment tools, and communication channels between teachers and students.

2.Educational software applications: Various educational software applications are used in primary schools, covering subjects like mathematics, science, language learning, and more. These applications offer interactive exercises, simulations, and educational games to support student learning.

3.Productivity software: Productivity software tools like word processors, presentation software, and spreadsheets are used by students and teachers for creating and sharing documents, presentations, and assignments.

4. Internet browsers: Internet browsers enable access to online educational resources, digital libraries, educational websites, and other web-based tools. They facilitate research, online collaboration, and access to multimedia content.

5. Security software: To ensure the security and safety of digital infrastructure, primary schools utilize antivirus software, firewalls, and content filtering tools to protect against cyber threats and restrict access to inappropriate content

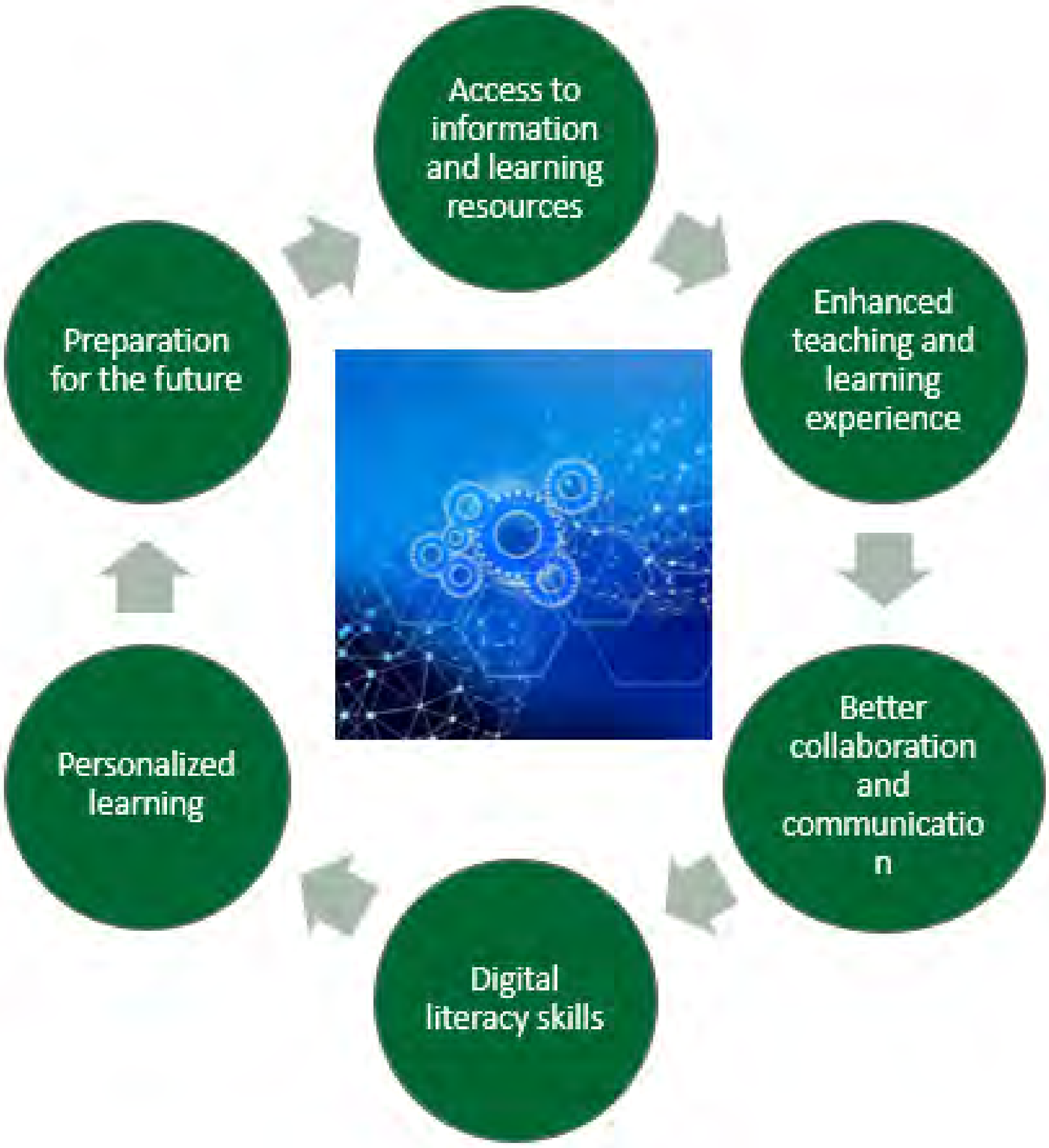


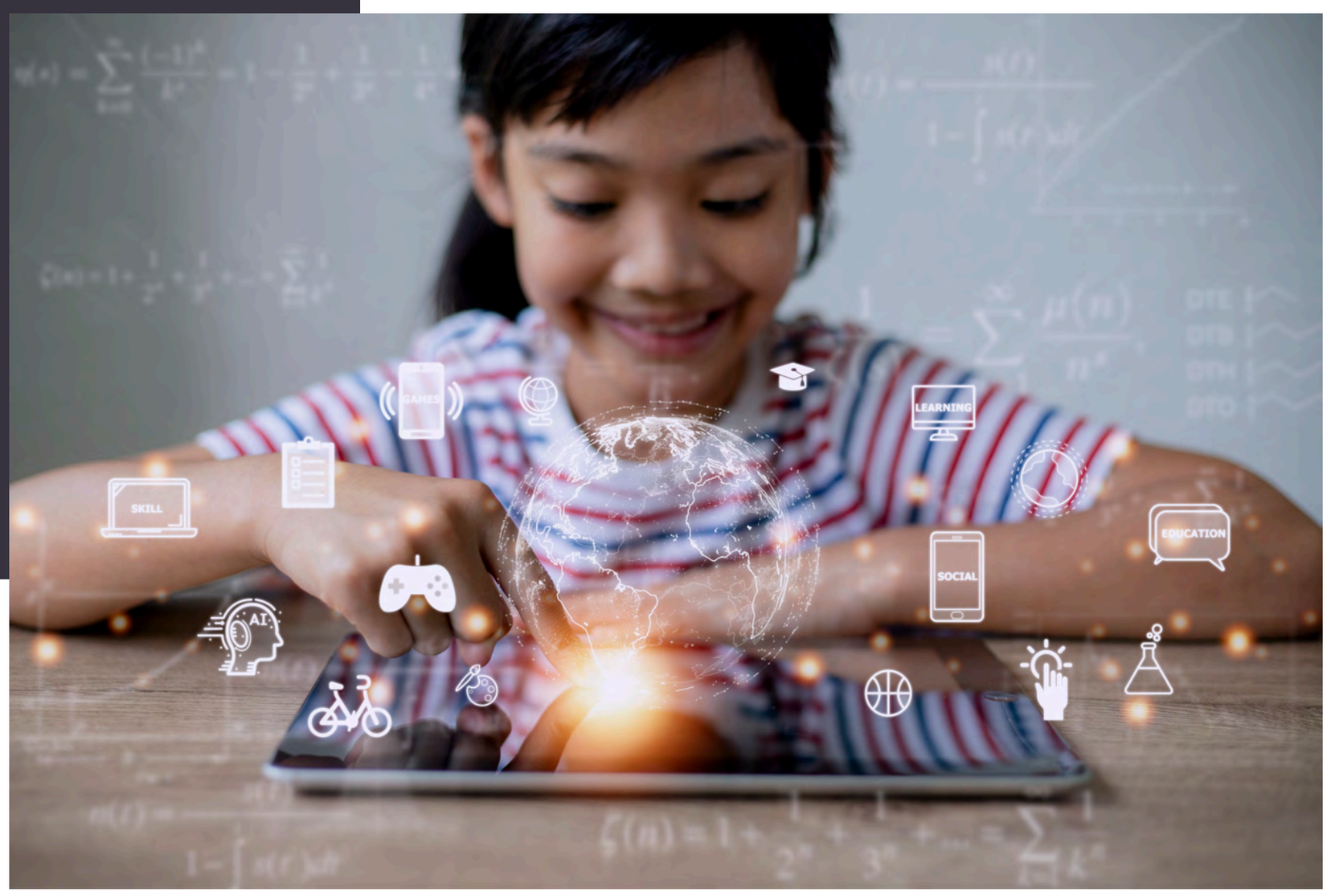
The specific hardware and software infrastructure in primary schools can vary depending on various factors.

These factors are primarily budget, technological readiness, and local policies.

Therefore, it is important for schools to assess their specific needs and select appropriate hardware and software solutions that align with their educational goals and resources.

DIGITAL INFRASTRUCTURE PROVIDES SEVERAL BENEFITS TO PRIMARY SCHOOLS. AMONG THEM:





CONTENT III

Access to digital infrastructure in education and beyond

Access to digital infrastructure in education refers to the **availability and utilization of digital technologies and resources in the educational sector.** It encompasses the accessibility of devices, internet connectivity, software applications, online platforms, and other digital tools that support teaching, learning, and administrative processes in educational institutions.

Ensuring access to digital infrastructure for everyone in the school promotes equitable educational opportunities, as it allows all students, teachers, and staff members to benefit from the resources and tools available. It fosters inclusivity and eliminates the digital divide, enabling equal access to information, learning resources, and technological skills.

Primary schools need access to digital infrastructure for several reasons.

- Firstly, it enables them to integrate technology into their teaching methods, enhancing the learning experience and engaging students in new and interactive ways.
- Secondly, digital infrastructure provides access to a wide range of educational resources, enabling teachers to supplement traditional materials with online content to enrich the curriculum.
- In addition, it helps develop digital skills in students, preparing them for life in a technology-driven society.
- Finally, digital infrastructure facilitates communication and collaboration between students, teachers and parents, creating a more connected and inclusive learning environment.

I. BASIC PRINCIPLES OF EVALUATION AND MANAGEMENT OF THE AVAILABLE EDUCATIONAL TECHNOLOGIES

Evaluation and management of educational technologies involves a systematic approach to assessing their effectiveness and implementing strategies for their effective use. Following are some basic principles to consider when evaluating and managing available educational technologies:

1. Clearly define goals and objectives: Begin by establishing clear goals and objectives for integrating educational technologies. Determine what you want to achieve through their use, such as improving student engagement, enhancing learning outcomes, or increasing efficiency in instructional delivery.

2. Conduct a needs assessment: Before selecting specific technologies, conduct a thorough needs assessment to identify the requirements and challenges of your educational context. Consider factors such as infrastructure, resources, learner characteristics, and instructional needs. This assessment will help align technology choices with the identified needs.

3. Research and evaluate options: Explore the available educational technologies that align with your needs assessment. Research and evaluate different tools, platforms, and software to determine their suitability for your educational goals. Consider factors such as functionality, usability, accessibility, scalability, cost, and support services.

4. Involve stakeholders: Involve various stakeholders, including teachers, administrators, students, and IT staff, in the evaluation and management process. Seek their input and perspectives to ensure that the selected technologies meet the needs and preferences of all parties involved. Consider conducting surveys, focus groups, or pilot programs to gather feedback.

5. Assess pedagogical alignment: Examine how well the educational technologies align with your instructional strategies and pedagogical approach. Consider whether the technologies support active learning, collaborative activities, differentiated instruction, assessment, and feedback. Ensure that the technologies enhance and complement your teaching methods rather than replacing them.

6. Consider scalability and sustainability: Evaluate the scalability and sustainability of the educational technologies. Consider factors such as the ability to integrate with existing systems, compatibility with different devices and platforms, ease of implementation and maintenance, and long-term cost-effectiveness. Choose technologies that can grow and adapt with your institution or organization.

7. Provide professional development and support: Recognize that successful implementation of educational technologies requires adequate training and support for educators. Plan and provide professional development opportunities to familiarize teachers with the selected technologies, enhance their digital skills, and help them integrate the technologies effectively into their instructional practices.

8. Monitor and evaluate effectiveness: Continuously monitor and evaluate the effectiveness of the implemented educational technologies. Collect data on student performance, engagement, and satisfaction. Use assessment tools, analytics, and feedback mechanisms to measure the impact of the technologies on teaching and learning outcomes. Adjust your strategies and make improvements based on the gathered evidence.

9. Stay informed and adapt: Educational technologies are continuously evolving. Stay updated with emerging trends, research, and best practices in the field. Regularly evaluate the effectiveness and relevance of the technologies you are using and be willing to adapt and explore new tools or approaches when necessary.

- When these principles are followed, the assessment and management of educational technologies can be improved, leading to better teaching and learning.

See **Unit 3** for more info about digital learning leadership for school community

I. CLAIMING THE APPROPRIATE DIGITAL INFRASTRUCTURE FOR SCHOOL COMMUNITY

Claiming adequate digital infrastructure for the school community refers to advocating for and securing the necessary technological resources and infrastructure to support teaching, learning, and administrative functions.

It covers various components such as **reliable internet connectivity, sufficient computer hardware** (desktops, laptops, tablets), **interactive displays, educational software and applications, networking infrastructure, data storage solutions, and technical support services.**

Adequate digital infrastructure also encompasses **cybersecurity measures** to ensure the safety and privacy of digital resources, as well as **ongoing training** and **professional development opportunities** for teachers and staff to effectively utilize the technology.

In simplest terms, appropriate digital infrastructure refers to the suitable and necessary technology, devices, connectivity, software, and support systems that are in place to facilitate effective digital learning and communication in an educational setting.

It ensures that students, teachers, and administrators have access to the required tools and resources to engage in digital activities and maximize the benefits of technology for teaching, learning, and administrative tasks.

II. CLAIMING THE APPROPRIATE DIGITAL INFRASTRUCTURE FOR SCHOOL COMMUNITY

Primary schools can claim adequate digital infrastructure for the school community by following these steps:

1.Needs assessment: Conduct a thorough assessment of the school's digital infrastructure requirements. Identify the existing infrastructure, including hardware, software, networking capabilities, and internet connectivity. Evaluate the gaps and determine the specific needs of students, teachers, and staff members.

2.Funding and resources: Seek funding sources and resources to support the implementation and maintenance of digital infrastructure. Explore government grants, educational technology programs, partnerships with private companies, and community fundraising initiatives. Allocate a budget for hardware upgrades, software licenses, internet connectivity, and ongoing technical support.

3.Infrastructure planning: Develop a comprehensive plan outlining the specific digital infrastructure requirements for the school community. Consider factors such as the number of devices needed, internet bandwidth, networking infrastructure, and security measures. Collaborate with IT professionals, educational technology specialists, and relevant stakeholders to design an efficient and scalable infrastructure plan.

4.Partnership and collaboration: Engage with technology vendors, educational organizations, and local communities to establish partnerships that can provide support, resources, and expertise. Seek guidance from technology experts who can offer insights into best practices and assist in the implementation and maintenance of digital infrastructure.

5.Training and support: Provide adequate training and professional development opportunities for teachers and staff members to ensure they are proficient in using the digital tools and resources effectively. Offer ongoing technical support and troubleshooting assistance to address any challenges or issues that arise.

6.Monitoring and evaluation: Regularly assess the effectiveness of the implemented digital infrastructure. Monitor its impact on teaching and learning, gather feedback from teachers, students, and parents, and make necessary adjustments to improve its functionality and address emerging needs.

CONTENT IV

Maintenance of digital infrastructure

Maintenance of digital infrastructure in school

Maintaining the digital infrastructure in schools is crucial for supporting effective teaching and learning in today's digital age.

By effectively maintaining the digital infrastructure in schools, educational institutions can ensure that students and staff have access to reliable and secure technology resources that support their learning and teaching goals.

Key aspects of maintaining digital infrastructure in schools are:

Hardware and software maintenance

This involves ensuring that computers, laptops, tablets, interactive whiteboards, projectors, and other hardware devices are properly maintained. Regular hardware checks, updates, and repairs should be conducted as needed. Similarly, software systems, including operating systems, educational software, and security software, should be updated and patched regularly to ensure optimal performance and security.

Network and internet connectivity

Schools need to maintain a reliable and secure network infrastructure to support internet connectivity throughout the campus. This involves regular monitoring of network equipment, such as switches and routers, to identify and resolve any issues that may arise. Additionally, schools should have appropriate web filtering and firewall systems in place to protect students and staff from accessing harmful or inappropriate content.

Data management and security

Schools handle a significant amount of sensitive student and administrative data, so it's crucial to have proper data management and security practices in place. This includes regular data backups, implementing access controls and user privileges, and educating staff and students about data privacy and security measures. Schools should also have protocols for responding to and recovering from potential data breaches or system failures.

Technical support and helpdesk

Schools should have dedicated technical support personnel or an IT department to provide assistance to staff and students. This includes addressing hardware and software issues, troubleshooting connectivity problems, and providing guidance on using educational technology effectively. Having a helpdesk system in place, such as a ticketing system, can streamline the process of reporting and resolving technical issues.

Equipment upgrades and future planning

Technology evolves rapidly, so schools need to regularly assess their digital infrastructure and plan for future upgrades and improvements. This may involve budgeting for equipment replacements, evaluating emerging technologies that could enhance teaching and learning, and staying informed about trends in educational technology.

OBSERVING THE DIGITAL LEARNING INFRASTRUCTURE IN YOUR SCHOOL COMMUNITY

Observing the digital learning infrastructure in a school community involves assessing the availability, accessibility, and effectiveness of the digital tools and resources used for teaching and learning purposes.

By observing these aspects of the digital learning infrastructure in a school community, one can gain insights into its strengths, weaknesses, and areas for improvement. This information can guide decision-making processes to enhance and optimize digital learning experiences for students and teachers.

The main goal of observing digital learning infrastructure in the school community is to ensure that it supports effective and inclusive education, improves the teaching and learning experience and prepares students for the digital world.It is very important to evaluate its efficiency, identify areas for improvement and ensure that it is aligned with the learning objectives and needs of students and teachers.

See **Unit 1** for more info about inclusive digital learning

Below are some key aspects to consider during such an observation:

1.Availability of devices: Take note of the number and types of devices available to students, such as computers, laptops, tablets, or interactive whiteboards. Assess if there are sufficient devices for all students and if they are in good working condition.

2.Internet connectivity: Evaluate the quality and reliability of internet access in the school. Check if there are any connectivity issues or limitations that could hinder the use of online resources or communication platforms.

3.Software and digital learning platforms: Observe the variety and suitability of digital learning platforms and educational software being utilized. Assess if they align with the curriculum, offer interactive and engaging content, and provide opportunities for personalized learning.

4.Teacher proficiency: Pay attention to the level of teachers' digital literacy and their ability to effectively integrate technology into their teaching practices. Evaluate if teachers receive adequate training and support to utilize digital tools and resources to enhance instruction.

5.Student engagement: Look for signs of student engagement and active participation during digital learning activities. Assess if students are effectively using the digital tools and resources provided, collaborating with peers, and demonstrating understanding of the content.

6.Technical support and maintenance: Evaluate the availability of technical support for troubleshooting and addressing technical issues promptly. Check if there are mechanisms in place to regularly maintain and update devices and software.

7.Equity and accessibility: Consider whether the digital learning infrastructure is accessible to all students, including those with disabilities or from marginalized backgrounds. Assess if efforts are made to address any potential inequalities in access to technology.

CONTENT V

Summary

Accessing and maintaining digital infrastructure for all in primary school is crucial for ensuring equitable and inclusive education in the digital age. It involves providing students, teachers, and schools with the necessary tools and resources to access and utilize digital technology effectively. This includes hardware such as computers, tablets, and internet connectivity, as well as software and digital learning platforms.

Furthermore, maintaining digital infrastructure requires ongoing support and maintenance to ensure its optimal functionality. This includes technical support, regular updates, and security measures to protect against cyber threats. Training and capacity building programs for teachers and administrators are also essential to empower them with the necessary digital skills to integrate technology into their teaching practices.

To achieve this, governments, educational institutions, and organizations need to prioritize investments in digital infrastructure, particularly in underprivileged areas where access to technology is limited. This may involve establishing computer labs, providing devices to students, and improving internet connectivity in schools.

By ensuring that all primary schools have access to and can maintain digital infrastructure, we can bridge the digital divide, enhance educational opportunities, and foster digital literacy and skills among students, setting them up for success in the digital era.

CASE STUDY 1: POLISH GOVERNMENT PROGRAMME TO IMPROVE SCHOOL INFRASTRUCTURE AND THE ICT COMPETENCES STUDENTS AND TEACHERS

A short story from the field

The 'Aktywnatablica' (Active Blackboard) programme is a Polish government programme to develop school infrastructure and the competences of students and teachers in the field of information and communication technologies for the years 2020-2024. The programme aims to increase the availability of modern technologies in schools and to develop the skills of students and teachers to use them. Under the programme, schools receive grants to purchase multimedia equipment, including interactive whiteboards, multimedia projectors, computers and software. In addition, the programme provides training for teachers in the use of modern technologies in the teaching process.

What is the point

The programme will run from 2020 to 2024 and will provide schools with the necessary digital infrastructure in the form of: modern equipment, teaching aids as well as therapy tools (as the programme also covers students with special educational needs), so that the financial support is tailored to the needs and capabilities of all students and teachers who are beneficiaries of the programme

Some questions for reflection

Do you think programmes such as this one are currently needed?

Who will benefit most by being a participant in such a programme?

Were you aware of the existence of similar programmes? What does it look like in your country?

CASE STUDY 2: INCREASED INVESTMENT IN DIGITISATION OF SCHOOLS IN POLAND

A short story from the field

In recent years, financial outlays for the digitisation of schools have amounted to around 8 billion PLN. These funds were earmarked for, among other things, the development of school infrastructure and other projects. One of them is the All-Poland Educational Network, i.e. fast and secure Internet with a capacity of 100 Mb/s. More than 90 per cent of eligible schools have already been connected to the project. The increase in expenditure on digital education was also linked to distance learning. The additional funding benefited, among others, teachers who received funding for the purchase of computers, tablets and other accessories for remote learning. The Ministry of Education and Science is also continuously developing the Integrated Education Platform. This is a comprehensive teaching-learning environment with a database of almost 10,000 free e-materials for general education, vocational education and inclusive education. At the peak of the platform's popularity, a record 4.5 million page views per day were registered. There are currently around 8 million user accounts on the platform

What is the point

As part of the plan to digitise schools in Poland, it is envisaged, among other things, to equip schools with modern multimedia equipment and build network infrastructure while training staff in its use. The government has allocated large amounts of money to the digitisation of schools, to broadband access. It is worth noting that these measures and investments in school infrastructure were of great importance during remote learning during the COVID-19 pandemic.

Some questions for reflection

Why is it so important to ensure that schools have the right digital infrastructure?

Is funding sufficient in this regard?

What other ways would you see to raise funds to improve access to digital infrastructure in schools?

CONTENT VI

Q&A

1. Among other things, what benefits does digital infrastructure bring to primary schools?

a) preparation for the future, greater trust in educational institutions, implementation of softskills

b) personalised learning, enhanced teaching and learning experience, better collaboration and communication

c) understanding the utility of ICT, enhanced teaching and learning experience, greater trust in educational institutions

2. What brings effective digital infrastructure maintenance to schools?

a) Through this, schools can ensure that students and staff have access to reliable and secure technology resources that support their learning and teaching objectives.

b) Through this, schools are demonstrating their commitment to educating students.

c)Through this, schools provide access to data analytics, project management systems and cloud-based collaboration tools.

3. What is not among the principles when evaluating and managing accessible educational technologies?

a) Involving stakeholders.

b) Looking for the best alternatives.

c) Assessing pedagogical alignment.

4. What does not count as a key aspect of digital infrastructure maintenance in schools?

a) Technical support and helpdesk.

b) Network and Internet connectivity.

c) Needs assessment.

BIBLIOGRAPHY

Brown, S. (2021). Digital education platforms and how they're helping schools. Retrieved from: https://dfedigital.blog.gov.uk/2021/02/12/digital-education-platforms/

Buhere, P., Kitari, J.W., Obaki, S. (2019). ICT infrastructure and Pupils Learning Outcomes: A Case of Matete Sub-County Primary Schools, Kakamega County. International Journal of Scientific and Research Publications, Volume 9, Issue 10, 381. Retrieved from: https://www.ijsrp.org/research-paper-1019/ijsrp-p9450.pdf

Dannecker, A., Khalek, J.A. (2021). Accelerating access to digital infrastructure: The time is now. Retrieved from: https://blogs.worldbank.org/digital-development/accelerating-access-digital-infrastructure-time-now

Dolan, J., Vora, P. (2022). What is 'good' digital infrastructure? Measuring digital infrastructure to maximize development outcomes and mitigate risks. Brookings Global Working Paper #167. Global Economy and Development program at Brookings. Retrieved from: https://www.brookings.edu/wp-content/uploads/2022/02/Good-Digital Infrastructure.pdf

Falck, D., Peirano, C., Severin, E. (2012). Technologies for Education. Basic Guidelines for Project Evaluation. Inter-American Development Bank, No. IDB-TN-390. Retrieved from: https://publications.iadb.org

International Telecommunication Union (ITU). (2021). School connectivity equips learners for education, work, and life. Retrieved from: https://www.itu.int/hub/2021/11/school-connectivity-equips-learners-for-education-work-and-life/

Pata, K., Tammets, K., Väljataga, T. et al. (2022). The Patterns of School Improvement in Digitally Innovative Schools. Tech Know Learn 27, 823–841. Retrieved from: https://doi.org/10.1007/s10758-021-09514-5

Soft Egg. (2021). Assessing Your School ICT Infrastructure. Retrieved from: https://www.softegg.co.uk/blog/assessing-school-ict-infrastructure#

Rządowy program rozwijania szkolnej infrastruktury oraz kompetencji uczniów i nauczycieli w zakresie technologii informacyjno-komunikacyjnych na lata 2020-2024 - „Aktywna tablica”. Retrieved from: https://www.gov.pl/attachment/9696548c-421f-49b0-8bcb-4867af139cb7

Sustainable Digital Infrastructure Alliance (n.d.). Definition for Digital infrastructure. Retrieved from: https://sdialliance.org/dictionary/digital-infrastructure/

teachonline.ca. (2020). Ten Guiding Principles for the Use of Technology in Learning. Retrieved from: https://teachonline.ca/tools-trends/how-use-technology-effectively/ten-guiding-principles-use-technology-learning

UK Department for Education. (2019). Assessing your school ICT infrastructure. Retrieved from: https://www.gov.uk/government/publications/assessing-your-school-ict-infrastructure/assessing-your-school-ict-infrastructure

QUIZ ANSWERS

Learning unit 1

1.a 2.c 3.b 4.b 5.c 6.a

Learning unit 2

1.c 2.c 3.c 4.a 5.a 6.b

Learning unit 3

1.c 2.b 3.c 4.c 5.c 6.c

Learning unit 4

1.b 2.a 3.b 4.c

Integration guidelines

The Digital Manual for primary school principals in online and inclusive education leadership is a complementary material for delivering effective training to primary school principals, as well as for educators, trainers and education facilitators, acting as a T&L tool.

RECOMMENDATIONS ON USING THE DIGITAL MANUAL

The Digital Manual for primary school principals in online and inclusive education leadership is a complementary material for delivering effective training to primary school principals, as well as for educators, trainers and education facilitators, acting as a T&L tool.

- An independent educational material to learn about online and inclusive education leadership.
- Resource to understand and find out about inclusive education, digital leadership and open educational resources.
- Self-explanatory methodology for teaching on the introduction and use of digital infrastructure, resources and tools at school.
- Supporting the preparation of workshops on inclusive digital learning, promoting digital intelligence in the primary school community, digital learning leadership for primary school community, and accessing and maintaining digital infrastructure for all – topics of the learning units.
- Aid for blended and flexible learning environments targeted at digital competence upskilling, when part of the training is completed through the online course and remaining in the classroom or e-reading at home.
- Available to download to desktops in order to be used in offline format without the need to have active Internet connection and regardless of location of the learner/trainer.
- Resource available for the school personnel and parents, in relevance to raising awareness on the importance of providing and supporting inclusive education, as well as contributing to the development of a culturally inclusive school demonstrated by individual attitudes and behaviours of those involved.
- Resource supporting the organization of meetings with parents when speaking about diversity, inclusion and equal opportunities, use of technology in education.

- Resource to understand and find out about inclusive education, digital leadership and open educational resources.
- Supporting resource to the Massive Open Online Course (MOOC), including key definitions and visual elements to better understand the topics in the learning units.
- Result that can be supplemented by the e-PRI4ALL mobile game-based application for revision and knowledge retention, as well as mobile learning.

ADDITIONAL SOURCES

Convention on the Rights of Persons with Disabilities

https://social.desa.un.org/issues/disability/crpd/convention-on-the-rights-of-persons-with-disabilities-crpd

Legislation Updates 2023 from the European Agency for Special Needs and Inclusive Education:

https://www.inclusive-education-in-action.org/resources/legislation-updates

Recommendation on Open Educational Resources (OER)

https://www.unesco.org/en/legal-affairs/recommendation-open-educational-resources-oer

Guidelines for Accessible Information (available in 26 languages):

https://www.european-agency.org/resources/publications/guidelines-accessible-information

Open digital educational tools for interactive online teaching and learning for teachers and students:

https://www.unicef.org/serbia/en/open-digital-educational-tools-interactive-online-teaching-and-learning

fbclid=IwAR067v6JOrSBC9qTn0quIvc6w7AJr2Txc85PclGnwYZsTN9EiEAe1-TBA9I

ePRI4ALL

Upskilling School Leaders

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