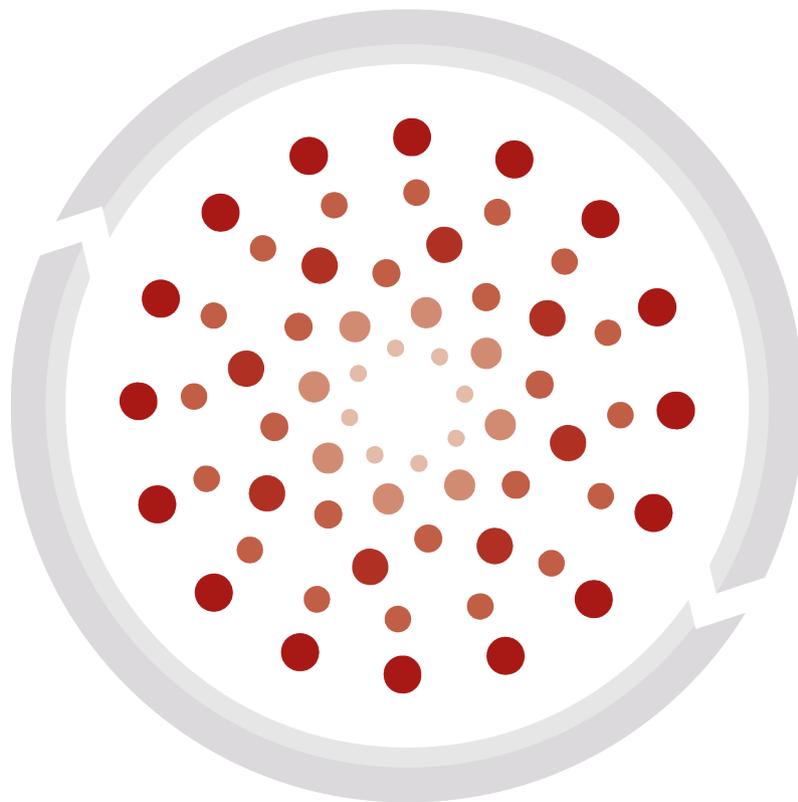




Digital Inclusion in Teacher Education

# Handbook 1

## Train the Trainer



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# 1 Introduction

This comprehensive Train the Trainer Manual for teacher educators should equip them with contents (chapter 3), didactical methods for teaching digital inclusion. University staff will be able to be trained with this Manual to apply and teach with the recommended Software Applications and didactic tools (chapter 4), developed in the project DIGITclue. It will enable/help them to enhance their work with pre-service and in-service teachers about digital literacy and inclusive pedagogy. The interdisciplinary team that worked on this project has been challenged by the question what can be useful knowledge for teachers. Generally, new strategies are needed to incorporate new ideas, approaches, and definitions into curricula and schools (Schensul, Gonzalez Borrero, & Roberto, 1985) and science sometimes lacks the innovative ideas to implement theory into diverse fields of practice. Many anthropologists work in practice or combine the work in theory and practice. Especially ethnography is a good method, also in schools, to explore a variety of topics and problems. Being trained in the method of (auto)ethnography is valuable for practice. It teaches one to withhold one's own judgment, to listen more than to just speak, to respect diversity and differences, and to not make conclusions until one has collected data in a long-term immersive process. On the other hand, some scientists gained practice experience before entering into research. This practical experience helped them to later gain positions in the academia. The combination of practice and theory is often an advantage, as they are closely intertwined.

The theory that is brought to the table must then be transformed for other practitioners, as purely theoretical concepts are often not useful in the practice of education. Teachers without an anthropological training often do not know how to apply the, sometimes very complex, theories in the classroom. At the same time, it is helpful, if anthropologists have practical experience, because they then know better how to meaningfully apply theory in practice (Schensul, Gonzalez Borrero, & Roberto, 1985). To enhance and connect both experiences and processes is the basic in this Train the Trainer Manual. The Team worked together with educational anthropologists, media experts, technologists, educational scientists, teachers and teacher trainers in order to meet this demand.

Research can contribute more to the solution of a problem than just writing theoretical texts about it. Low (2011) also argues for the approach that engagement in "real world" problems should be central to anthropological practice. Low argues for theories of anthropology to actively engage practice, such as issues of social inequality or racism. He understands engaging problems, on the one hand, using engaged anthropology to gather the problems and based on that, using theory to find solutions to those problems, especially for vulnerable and marginalized groups. (Low, 2011)

In doing so, engaged science attempts to address both how theory affects practice and practice affects theory. The advantage of converting theory into practice, as well as converting practice into theory, lies in the responsiveness of the two perspectives. If theory is transformed into practice by being part of the practice itself, one can thereby gain insights that would not be possible without this participation. From these insights, new theories can in turn be generated. Kirsch (2018) describes it as not only understanding what is happening in a field, but also actively responding to it, so that the actors in the field benefit from the researcher's work.

Practice refers to being a part of social reality and being embedded in parts of social life. Therein lies the very possibility of improving the relationship between theory and praxis. On the one hand,

there is the attempts, to understand and explain the (social) world by foregrounding interconnected phenomena and processes, the theory. On the other side, there are the subjective experiences and the social reality, the praxis. Both sides affect the knowledge produced.

We believe that Digital Inclusion can be a powerful tool for being part of building inclusive and pluralistic democratic societies. Democratic principles, including, among others, gender/LGBTQIA\*equality, education free of racism, freedom of speech and religion in the context of ongoing digitalisation of the world are not self-understood. They need to be taught. Moreover, various studies have shown how experiences of discrimination and exclusion have a negative impact on students' academic performance, if not on their motivation to attend school in the first place. Considering these challenges in European societies, the overall aim of this manual is to improve the quality of teaching in order to support the creation of inclusive schools that provide young people with the necessary skills to participate in democratic life and global knowledge. We would like to equip teachers with the skills, knowledge and tools to use ICT-based interactive and E-Learning technologies for inclusive teaching. A central and innovative aspect of the project is to ensure the inclusion of teachers with special needs, multilingual teachers or hard-to-reach teachers working in remote and marginalised areas in every step of the development and delivery of teaching materials.

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## 2 Didactic Framework behind DIGITclue

Authors: Christa Markom & Magdalena Steger

For the didactic embedding of the concepts, we have focused on several didactic, methodological, as well as pedagogical concepts and categories of analysis. The concepts are structured according to the so-called “subject analysis”. It goes beyond a mere collection of knowledge and focuses on concrete aspects and their relationship to each other (Lehner, 2012; Becker, 2012). The overall didactic approach is based on Klafki’s idea of categorical education as well as the five basic questions he asks of education (Kron, Jürgens & Standop, 2014; Klafki, 1964).

### 2.1 Subject analysis

Subject analysis is a part of lesson planning and is one variant (among others) to structure and build up the lesson.

Central to it is the problem that subjects are often very broad and difficult to narrow down. Especially in the classroom, a topic should be shortened so that the learners can study as much as possible and in the least amount of time possible. However, narrowing down something, so that all-important aspects are present is a challenge. This is where the subject analysis comes in. It works with two steps. In the first step, you are working with the subject analysis and based on that, on the didactic level. It assumes that, before working with the learners, the teachers themselves have a good understanding of the content. Therefore, the basic idea is that educators in the first step deal with specialized literature, read up, and accumulate knowledge (Becker 2012, p. 86-91). The idea is not necessarily to simplify the content, but to reduce it while not compromising the quality. (Lehner, 2012)

At the first level, the following questions can be asked:

- Which subject-specific scientific foundations are significant for the topic?
- What larger disciplinary contexts need to be considered?
- Which subject-specific characteristics need to be taken into account?

At the second level, the didactic analysis comes into play. Here, the meaning of the topic for the learners should be considered. Based on their experiences, as well as access opportunities, the content that was previously accumulated is reduced. (Lehner, 2012)

The following questions can be asked at this level:

- What is the significance of the individual contents for the target group, i.e., which terms, principles, methods, and theories are of fundamental importance for the learners?
- From which perspective should the contents be developed and which approaches to the topic can be used?
- In which order and according to which didactic logic should the content be developed? (Lehner, 2012, p. 67-69)

For this purpose, a so-called "subject map" (in German: Fachlandkarte) can be used. The basic idea follows that of a mind map. Content is presented as a concept network for a better overview and orientation (Lehner, 2012, p. 160). This can be done according to the following points:

- Write down/research terms
- Relate/order them to each other/find central categories: Sub-terms, umbrella terms, concepts....
- Note important people and literature next to them
- Write current and/or unresolved issues next to it

Once the subject map has been created, the second step is to reduce the content to adapt it to the time available for this topic. Partial aspects can be formulated in such a way that they can be added or omitted depending on the time available.

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*The goal of the subject analysis is to present the content in a structured way, to classify a chosen topic scientifically, and to prepare scientific problems.*

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## 2.2 Basic didactical questions according to Wolfgang Klafki

While we have focused on the subject analysis for the creation of individual concepts, we have used the concept of categorical education and the basic didactic questions according to Klafki (1964) for the overall didactic preparation, as well as their extension by Kattmann et al. (1997).

The idea of Klafki's categorical education is based on his critique of the educational theory approach. This is based on the approach that the human being is in a dynamic relationship with the cultural world and interprets it in a way that makes sense to oneself. In this process of understanding, the learners are considered to play a central role. Thereby this is seen as education, which is divided into material and formal education.

Klafki criticizes this division, since both types of education are interrelated. Education must, according to him, always be seen as a whole process and therefore he develops the concept of "categorical education" (Kron, Jürgens & Standop, 2014, p. 71-72).

Based on the approach of categorical education, Klafki developed the didactic analysis for lesson planning. For this purpose, he thought of five basic didactic questions according to which he forms a concept for teaching.

1. What is the meaning of the educational content?
  2. What is the present meaning of the subject?
  3. What is the future meaning of the subject?
  4. What is the structure of the content and what is the educational goal?
  5. What are favourable teaching and learning conditions for this topic?
- (Kron, Jürgens & Standop, 2014, 77-78)

Each question can be further expanded and concretised to be more specific about the content and meaning of the individual topic. Teachers should ideally go through and answer these questions before the lesson in order to address the learners and their life situation best. The following section uses the concept of *Digital Inclusion* to provide some reflection on these questions, as well as further in-depth questions.

### **What is the meaning of the educational content?**

Thematically, the questions in this category, address the importance of the content and the importance of engaging with it. The idea is to think about where it might help learners to engage with it later.

- ▶ How can the aspects, which are learnt in Digital Inclusion, be helpful in life later? Think not only about Digital Inclusion as a whole, but also of individual ideas, concepts, techniques and working methods.

Teachers are no longer only responsible for imparting subject knowledge, but also for addressing social and socio-critical competencies. In this case, this also applies to Digital Inclusion. Getting to grips with this aspect at an early stage and reading up on it, can help teachers in their lessons to become more aware of it itself.

Furthermore, thinking about this topic helps teachers to deal sensitively with it in the classroom and perhaps recognize better and faster where digital inclusion is necessary. It can also make them realize how diverse Digital Inclusion is.

#### Further questions:

- ▶ What is the larger or general context of meaning or subject matter that Digital Inclusion represents?
- ▶ What is digital inclusion supposed to exemplify/represent?
- ▶ What basic principle/problem/attitude can be grasped in the discussion of digital inclusion?

### **What is the contemporary significance of the topic?**

The focus in this category is on the current significance of the topic for the group. This is about prior knowledge, ideas, and meanings by and for the group of learners.

- ▶ What is the current meaning of digital inclusion for this group?

Topics like inclusion have long been a part of the social debate. As the Internet and the online world become more and more important, also in education, the idea of digital inclusion also raises significance. In many areas of the media world, people are confronted with it. Some members of the group have certainly already had to deal with these different aspects of (digital) inclusion. One example would be the inability to read and understand a website, because of the lack of language translation. Another example would have to go to a coffee shop to study because you do not have an internet connection at home.

#### Further questions:

- ▶ What does this group already know about digital inclusion?
- ▶ In what institutional and non-institutional contexts might they have already had access?
- ▶ What "wrong", limited views, and what prejudices does the group possibly associate with digital inclusion?
- ▶ What is the significance of digital inclusion or the experience, knowledge, ability, or skill to be gained from this topic in the group's intellectual life?

### **What is the future significance of the topic?**

This category is about what the study of this topic brings to the learners for the future. Pupils in particular like to ask the question, "Why do I need to learn this? Why do I need this in my future?" The following questions and considerations address this very issue.

- ▶ What is the significance of digital inclusion for the future of this group?

For student teachers, dealing with this topic is so important because it will be a part of their future professional life. Digital media are becoming increasingly popular in the classroom. This also raises the question of digital inclusion when these media are used. Teachers should also ask themselves how they could use digital media inclusively in their lessons. Dealing with this topic during training is an important aspect in order to be able to cope well with the challenges later on.

#### Further questions:

- ▶ What general insights should the group gain?
- ▶ Can the group become aware of this future reference? Can it be communicated?

### **What is the structure of the content and what is the educational goal?**

These considerations are about how the content needs to be structured and built up so that learners understand it well. Furthermore, it is about what goal one wants to achieve by teaching the topic. For this, one should think about how the group is composed and what knowledge they already have.

- ▶ What subject knowledge must already be available?

Working on digital inclusion requires basic knowledge of inclusion and of the term digital.

#### Further questions:

1. What is the indispensable minimum knowledge/skill that will be taught/should be known/mastered at the end?
2. What elements, aspects, structures, and relationships form the subject and logical framework?
3. In what larger factual context is digital inclusion?

### **What are favourable teaching and learning conditions for this topic?**

Learners prefer to hear about concrete examples or life-experiences than attending a purely frontal lecture.

- ▶ Which views, hints, situations, observations, stories, experiments, models, etc. are suitable to help the learners to answer questions as independently as possible directed to the essence of the matter, the problem?

In order to convey questions or topics as well as possible, application-oriented ones are often the best idea. Learners could be put in situations where they are asked to think about digital inclusion. Based on this, it would be possible to make suggestions for improvement.

Further questions:

- ▶ What are the particular cases, phenomena, situations, experiments, persons, events, forms, elements, in or on which the structure of Digital Inclusion can become interesting, questionable, accessible, and comprehensible, to the learners of this educational level, this class?

The in-depth questions partially overlap and build on each other. They are meant to give an overview of how to approach a topic critically, as well as to reflect before starting teaching.

### 2.3 Didactic Reconstruction - An Extension of Klafki's Concept

Based on Klafki's classical didactic analysis, the concept of "didactic reconstruction" was developed (Kattmann et al. 1997) and is supposedly based on the learner's prior knowledge (Duit, 2004, p. 21-22). It is assumed that they already have some prior knowledge or assumptions about a topic. These perspectives should be taken into account in the didactic planning and, in the best case, be complemented by further professional knowledge (Reinfried, Mathis & Kattmann, 2009, p. 406-407). In addition to the five basic questions according to Klafki, the concept of didactic reconstruction asks further questions that relate to the learner's perspective.

In the context of the concept of Digital Inclusion, the questions can be as follows:

- ▶ What are the differences in how learners and academics think about Digital Inclusion?

Most people probably think of digital inclusion in terms of reading aloud text or captioning video. However, digital inclusion goes much further. It also includes the technical infrastructure, the clarity of a website, or the different languages in which something is written.

Further questions:

- ▶ How can we increase interest in digital inclusion?
- ▶ What could be the long-term effects of digital inclusion?
- ▶ What content do learners want when it comes to digital inclusion?
- ▶ How should the content be delivered?

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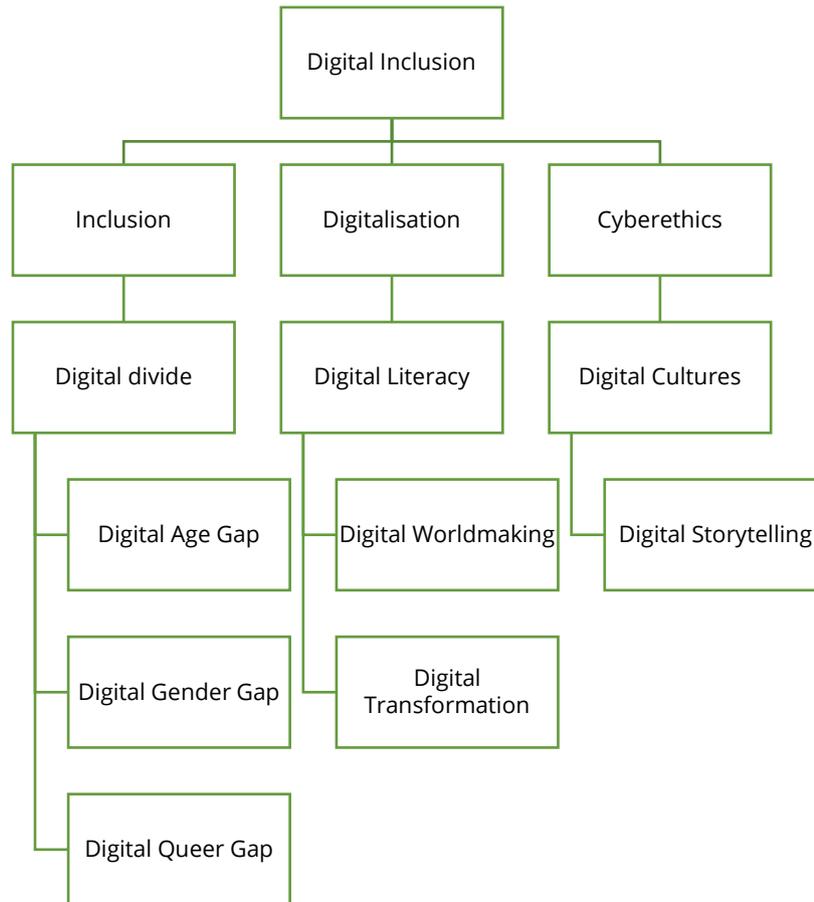
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### 3 Concepts

Every concept was developed concerning the context of education. The output was developed based on a meeting.

#### SCHEME OF THE CONCEPTS



#### 3.1 Digital Inclusion

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

**Digital Inclusion** can mean different things in different contexts unlike digital accessibility, which focuses on the use of digital systems and services by people to the widest extent possible. Depending on the social environment, someone is inhabiting, working or studying in, it can be defined in various ways. Furthermore, different disciplines (including anthropology, sociology, educational science and technology studies, humanities, and architecture, engineering, and math domains<sup>1</sup>) and research fields explore and apply knowledge on digital inclusion.

Digital inclusion refers to the ability of individuals and groups to access and use information and communication technologies regardless of their gender, age, socio-economic position, location, language, physical challenges etc.

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<sup>1</sup> STEM

Jochim (2021) defines digital inclusion as the possibility for everyone to participate in the digital media world. Here the term primarily refers to digital participation and related core issues of social inequality, and the unequal access to media and the internet. This implies not only having access to the internet, but exclusion due to lacking infrastructure. A number of authors (Norris, 2001) also refer to the notions of the **digital divide/inequality** and **digital inequality** (Robinson et al., 2015). Additionally, the individuals' competency is of high relevance, which is addressed by comprehensive discourse about digital competencies (Vuorikari et al., 2016). Only rarely discussed, is the momentum of different **digital culture(s)** and **cyberethics**, i.e. further concepts, which may lead to a different perception of the meaningfulness of digitality for any purpose (Köhler, 2021). There is an absence of competences to communicate due to lack of knowledge of sign language, braille, using captions, generate image descriptions and other media as specified by Web Content Accessibility guidelines.

Dickel and Franzen's (2015) sociological approach to digital inclusion, highlights that the digital change in the last decades, leads to new opportunities for digital participation and interactions in and through digital media. They view the increase of digital usage, as a sign of increased inclusion of society to participate, even in the scientific world. There are new possibilities to share and comment on developments in society. Franzen and Dickel here refer to "democratization of science". The base of this definition is Dirk Baecker's (2016) application of Luhmann's theory of the epoch change to the context and processes of digitalisation. The idea is that **digitalisation** has the potential to change social formations. This means that digitalisation not only refers to new possibilities of participation, but also changes society and reconfigures social relationships, and thus the dynamics and understanding of inclusion (Dickel & Franzen, 2015).

Lea Schulz's (2020) phenomenon of digital inclusion is captured in her novel concept of "Diclusion", which is an attempt to think about digitality and inclusion in an integrative and holistic way. This term refers to the handling and use of the digital media seen through the lens of **inclusion**. As it is thought of an integrated concept, both phenomena (digital and inclusion) mutually influence each other and can benefit from each other. Schulz uses this word in the context of the educational sector, but it can also be applied within other social spheres and with regard to different social phenomena and processes such as; race, gender, ethnicity, multilingualism, migration, sexual orientation, mental, sensory or physical disabilities, family, religion, world-making, culture, age, social class, and many others (Schulz, 2020).

The term diversity means variety, dissimilarity or heterogeneity. This includes various dimensions such as gender, sexual identity, age, worldview, social and ethnic origin, health and many more. Inclusion takes up this concept and is illuminated in all social areas of life, work and learning, in a versatile and cross-thematic way. Through the new possibilities of digital usage, approaches like activism can be transferred from the offline world into the online world, which is then called digital activism (Disability rights movement to acknowledge lobbyism of organisations and individuals representing people with a disability e.g. "not without us about us"). Political confrontation can be transferred to the virtual sphere. Together with the political dimension, comes the question whether digital inclusion should be considered a human right (Flavo, 2017)? With the internet, it is possible to spread ideas, ideologies, and stories all over the world. For young people in particular, who are growing up with digital media, it is a medium for sharing stories, experiences and wishes, processes and practices, captured by the concepts of **digital storytelling/narrative** (Dogan, 2021).

Besides the numerous advantages that accompany the usage of digital media, there are also aspects of exclusion. Like in many other areas, there exists a **digital gender gap** as well as a **digital queer gap**, which varies across the world (Mobile Gender Gap Report, 2020). Another aspect is the **digital age gap**. Digitalisation can lead to social inequality for people 65+, who as research shows, tend to use digital media to a lesser extent for a number of reasons (Schumacher Dimech & Misoch, 2017) and this provides a less pronounced digital literacy (Jones & Hafner, 2021; Falloon, 2020). These gaps can be summarized under the term **digital divide**, which describes the inequality concerning usage and access to digital media (Hartung-Ziehlke, 2020).

Today it is common in well-off countries (and beyond) to have access to the internet and digital devices. However, digital inclusion is also related to socioeconomic factors, since it is not possible for everyone to buy the required “digital infrastructure”, like PCs, laptops, smartphones, and internet access such as Wi-Fi-devices. A second point that is important in this context is related to education and labelled as “**digital literacy**” (Jones & Hafner, 2021; Falloon, 2020). Many apps and websites presume that every user can handle the sometimes-complex requirements. Thus, apart from the needed infrastructure, users need to have specific digital skills (Garmendia & Karrera, 2019). Two important related terms here are digital native and digital naive. They are describing to what extent and in what way people can make use of digital media in a critical, creative, and varied way (Ganguin & Meister, 2013). Indeed, it has been addressed earlier (Frindte & Köhler, 1999) that there are communicative techniques that serve inclusive practices. Most recently, just before and within the pandemic, the aspect of providing appropriate skill sets and programmes for development of competencies leads to unifying approaches on an international level with European (DIGCOMP, 2022) or even global standardization (UNESCO OER, 2022; UN SDGs, 2022).

Social exclusion is related to digital exclusion, since the category of language must be considered as well when trying to understand the digital as a space of in-/exclusion. Especially for ethnic minorities it is difficult to navigate through the internet, as there are seldom websites in their native language (such as Romani) or the possibility to translate does not exist (Garmendia & Karrera, 2019).

The so-called digital transformation does reach out to every domain of society. Among them, the conditions of knowledge access, including learning and other forms of participation, are influenced by technological conditions worldwide. Not only in Europe, educators are faced with the challenge of using digital media extensively in teacher training and at any educational institute, or to allow and support its usage. Most recent media concepts such as BYOD (bring your own device) or OER (open educational resources) represent only some aspect of comparatively extensive development dynamics. Industry itself does trigger further dynamics in the context of the so-called 4.0-metaphor and the respective new production technologies, which call for extensive momentum in potentially inclusive practices (Köhler & Marquet, 2017).

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## 3.2 Inclusion

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

In today's society, people are often discriminated against because they do not look or behave according to societal norms. Everything not corresponding to the "norm" is seen as (too) different and often associated with negative attributes. Paniagua calls this the "Myth of the normal child". (Paniagua, 2017) It implies that there is only one right way how children should act and behave. This often leads to misunderstandings, which manifest through language issues some pupils may have because they speak another primary language. Some teachers consider this to be a learning problem, perceive, and label the pupils as "lazy". Paniagua refers to this context of language and inclusion with the acronym LCSD (Linguistically, culturally, and socioeconomically diverse). He

uses this to include not only people with disabilities, but also people from ethnic minority groups (whose primary language is different from the language spoken in the country of residence), and people who are from low-income households. In his article he suggests that how people respond to diversity, is often mediated through their habitus (Paniagua, 2017).

Lang-Wojtasik & Schieferdecker employ a wide definition of inclusion as they define it as the right of participation within the society, independent from an attributed or official status. Within this definition, everyone should get the help needed for moving forward in life. It is important that not the individual have to adapt to society, but rather society to the individual. Here inclusion refers to the unlimited participation in every aspect of society, independent from the individual condition (Lang-Wojtasik & Schieferdecker, 2016: 78-80).

Naraian goes beyond this and defines inclusion as the attempt to create a framework where everyone can achieve the same output. Within this definition, the focus is on reaching the same result, and not receiving the same education. The central point here is the participation for all pupils, which should be ensured through diverse curricula and other educational structures. Pupil's differing socio-cultural backgrounds are addressed in this way (race, gender, ethnicity, disability, multilingualism, migration, sexuality, family, religion, world making, and age; cf. Naraian, 2011).

Saalfank & Zierer also define inclusion as the participation in education and knowledge in a broader sense. They highlight three ways in which inclusion can be seen: The role theory in general, as well as communication theory and in particular the network theory. Here, diversity and heterogeneity figure as two additional important concepts for understanding and defining inclusion (Saalfank & Zierer, 2017).

Another possibility to define digital inclusion is conceptually differentiating it from other terms like exclusion, separation, integration, and assimilation.

Inclusion can also be understood on border and boundary work. Thinking inclusively means to think about inclusion in a relative and relational way, since inclusion always implies and is constituted by forms of exclusion. This characterises every situation, in which a separation is pursued and a boundary between the inside and the outside is drawn. These boundaries can and need to be critically analysed (Nguyen, 2015).

Inclusion is negotiated in different societal areas such as media, the political sphere, and of course, very prominently in the context of education; different scales such as global, national, and local. The issue of power figures prominently within the discourses and practices of inclusion. Within exploring power and government, the question if (digital) inclusion should be a human right is also being raised (Nguyen, 2015).

According to Nguyen (2015), the discussion about inclusion and exclusion is strongly structured by government policies, as this is the base for the legal and normative coordinates of framing, regulating, and legitimising inclusion in society.

The problem here is that within norms and laws, the voices of individuals and communities particularly affected are not taken into account. One response to this problem is the reference to "voice", as highlighted by Naraian, as a tool to ensure participation in inclusive communities. If people are allowed to raise their voice and talk about what they want and need, this could account for and enhance an increased participation in society. However, the requirement here is that the voices are indeed heard. (Naraian, 2011) Another research example working with the notion of

“voice” are two projects in the UK with the aim of reducing discrimination of the GRT community (Gypsy, Roma, and Traveller). Here, the concept of voice is also used to show how the children can contribute to designing the lessons. (Brook Lapping Productions, 2006)

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## 3.3 Digitalisation

Authors: Danijela Birt Katić, Jadranka Brkić-Vejmelka, Ines Cvitković Kalanjoš

Digitalization is one of the main driving forces of contemporary society and could be considered one of the key elements of society's sustainable development (Jovanović & Dlačić, 2018).

Before we explain what is meant by the term digitalization, it is important to distinguish between another term and its meaning in order to understand and discuss the importance and steps of digitalization, and to properly observe these phenomena. This is the concept of digitization, which carries the following meaning: a process by which existing analogue records are converted into the digital documents. The data is not changed by this process but is only encoded in digital format. Digitization would be the first step in the digitization process.

Today's world has made a big step into the fourth industrial revolution, in conjunction with the process of digitalization, which is pervading all aspects of our life. Different definitions of the digitalization process can be summarized as follows: Digitalization is defined as a process by which various contents, texts, photography, sounds, films, and videos are changing from analogue to digital; transformed to a binary code. In this way all data could be processed, saved, and communicated. Most definitions would agree that digitalization has helped create inclusive environments in which everybody could be involved, enabled more open communication, and has accelerated the process of creating and exchanging knowledge (Martinoli, 2019).

For generations that are educated today, from pre-school to university education, digitalization is not a new technology but rather a natural environment and a part of everyday life. For these generations, the analogue world and the offline life is unthinkable. At the same time, today's world is partly digitalized because there are still parts of the population who are excluded from the digital world (see [Digital Divide](#)) as well as those resisting the process of digitalization. Thus, it would be more appropriate to say that we are living in a hybrid digital time.

In 2018 the European Commission published a Digital Education Plan (as most member states or even local authorities did) reflecting the challenges of digitalization in education. In this document education is considered as the basis of growth, development, and inclusion in all member states

and it has become the task for all participants to adhere to the Plan's suggestions as much as possible, while also considering all the challenges that digitalization brings along (e.g., Digital Divide, Digital Gender Gap). To ensure successful implementation, the suggested document highlights three priority measures: 1) Improvement in using digital technology in learning and teaching, 2) Development of digital competences and skills, 3) Education improvement by better data analyses and better predictions.

In education, digitalization contributes to a more inclusive environment with fair accessibility to learning materials, especially for students with special needs. By developing digital technology that is available to a larger number of users (for example laptops became more affordable because of the price reduction) and with the improvement of teachers' skills, better conditions are established for a growing number of users. At the same time, educational content and teacher-student connections through digital applications could increase the inequality among students and teachers (Tonković, Pogrančić, Vrsalović, 2020). On the other hand, the use of technology in teaching creates additional interest, fun, and dynamics for students. During the use of digital technology, it is observed that students are more motivated and research for content more independently (Gjud, Popčević, 2020). As we progress, new types of digital divide are appearing and becoming a big challenge (Kim, Yi, Hong, 2021).

During the time of the Covid-19 Pandemic, the intense development of digitalization in teaching was clearly shown, however we still do not have a sufficient explanation of how the acceleration of the digitalization process potentially contributes to the reduction of inequality, or how it enables more participants to become involved in and make use of digital resources. Although digital technology is quite helpful in teaching, it should be used in order to facilitate learning and accessing certain materials, but not to replace the onsite interaction between students and teachers. In the context of the pandemic, learning materials were prepared in a digital mode. By now, it is increasingly evident that this way of transmitting learning materials enables more creative, more innovative, and more flexible mode in the teaching process. Digital materials enable the implementation of new teaching methods and learning and enable flexibility for teachers during the process of preparation and structuring of the classes. The Pandemic accelerated digitalization, and hybrid teaching showed that it is necessary to have a ready-made system that could respond to new challenges of the digital era.

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### 3.4 Cyberethics

Authors: Robert Kleemann, Thomas Köhler

The basic idea of the “Theory of digital learning” (Köhler 2021) is that interaction in educational settings is taking place on the basis of data, with both real persons and their digital representations. Furthermore, it is about how the theory of digital learning and its main focus on data; do include both learners and teachers. The Theory suggests that on the first level of digitization there will be databased representations of the actors in education, i.e. teachers and learners. In the second level, only the data of both learner and teacher interact, i.e. there is no physical awareness in real life. Finally, in some cases, a third level may occur where even physical configurations (machines) interact with the learner or teacher or with each other. In every case, the data is the source of the interaction, whether it is a human or a robot as a computer-based machine.

Type of Digital Student	Description	Type of Digital Teacher	Description	Representation
Online Student I	Real student synchronous online	tele-teacher / online-tutor (synchronous)	‘real’ teacher but online	physical person
Online Student II	media representation of the students to be interacted with (perhaps asynchronously)	media representation of teacher / tutor to be interacted with (perhaps asynchronously)	peer 2 peer	mediated person
Virtual Student	student’s data to be interacted with	virtual teacher	avatar or AI	data representation of the person
Learning Robot	learning machine	teaching robot	machine teaching	Physical engine

Taking into account this manifold interrelation between humans and computers, a number of psychological, societal and ethical aspects become highly relevant to any practice. Cyberethics is the philosophic study of ethics pertaining to computers, encompassing user behaviour and what computers are programmed to do, and how this affects individuals and society (Tavani et al., 2013; Marquet & Köhler, 2017). Any didactic modelling of digitally processed perception, construction and evaluation in education, has to consider ethical perspectives, especially when it comes to the implementation of Artificial Intelligence (AI). In any educational technology (so-called “ed-tech”) system, ethics are nowadays considered as highly relevant. This orientation may focus on ethical, anthropological, legal (to a lesser extent) and social aspects of socio-technical arrangements. In consequence, educationalists should be prepared with comprehensive (media-) didactic expertise. Ideally, any educational expectation should be built on a (media-) didactic model. As well, it is recommended to follow a generic orientation as a key approach for ethically, legally and socially sensitive and responsible development of complex IT environments. For example, one may apply the principles of the PAPA Model (Ng, 2020) as it meets the interests of teachers or other educators in a fine way:

- **Privacy:** The right to keep or release certain information about a person.
- **Accuracy:** This is about the integrity and truth of a piece of information.
- **Ownership:** This dimension includes the ownership of a piece of information as well as the property rights.
- **Accessibility:** Meaning the possibility for a person or a company to obtain information.

The PAPA model has been modified for adolescents to meet their cyber education needs. From 10-19 years old, this age group is trying to find their own identity. They are associated with risky behaviour, especially in the online world. To protect them from harm, they need their own education on cyberethics.

Technically, such reflection may be summarized in any digital tool, becoming easily accessible to educators and learners. This may include any direction of a multimedia, interactive web application, whereby the media design and the media implementation should be derived from the (media-) didactic modelling (Köhler, 2021). Subsequently, options for media didactic framing may be developed, focusing first on recent trends of digital didactics and second on the meaning of the respective subject for the digital learning.

In order to have a practical showcase for a cyber-ethical approach, a practical application may be visited. For example, such has been developed by the Complex Ethics project, which delivers an easy-to-use tool.<sup>2</sup> By using this tool for example, AI-related ethical issues may be modelled and understood in their meaning for the construction, perception and evaluation of educational practice in ed-tech based worlds.

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## 3.5 Digital Divide

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

Today people must deal with the digital world in many parts of daily life. Areas such as healthcare, school, banks, government, and libraries are using ICT (information- and communication technology), which thus becomes a necessary instrument for citizens to use the respective services. In order to do this they must know how e.g., to use and access internet browsing, emails, blogs, or social networks. Even many companies are using various forms of ICT, which turns ICT knowledge into a precondition to acquiring a new job. However, not everyone has this knowledge. That is how the Digital Divide or digital gap appears. (Cruz-Jesus, Vicente, Bacao, & Oliveira, 2015: 73)

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<sup>2</sup> <https://www.complexethics.de>

The Digital Divide can be defined as:

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*“...the gap between individuals, households, businesses and geographic areas at different socio-economic levels with regard both to their opportunities to access ICT and to their use of the Internet for a wide variety of activities.”*

*(Cruz-Jesus, Vicente, Bacao & Oliveira, 2015: 72)*

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With this definition, the authors claim that there is not only digital inequality between individuals but also between countries, which is important to keep in mind when discussing the digital gap. Another definition comes from the NTIA (US Department of Commerce's National Telecommunications and Information Administration) and describes the digital divide as:

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*“...the divide between those with access to new technologies and those without.”*

*(Cruz-Jesus, Vicente, Bacao & Oliveira, 2015: 73)*

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Another way of defining the Digital Divide would be to highlight, that people with a low socio-economic status often participate less often in the digitalised world and therefore benefit less from it. Within this definition, there is a special focus on socio-economic status. Using healthcare as an example, some scholars see the Digital Divide as a barrier to accessing digital health supply (Müller, Wachtler, & Lampert, 2020).

Zillien (2009) also focuses on socio-economic status in regards to the Digital Divide. Here she describes the “knowledge-gap-hypothesis” in the context of digitalisation. People with a better socio-economic status use digital media to widen their knowledge and to gain information. This does not mean that people with low socio-economic status do not gain knowledge via the digital, but they often lack competence to cope with the complexity of information. This leads to higher inequality regarding the use of digital media (Zillien, 2009: 70-72). Zillien also refers to the definition provided by Pippa Norris, who separates the digital divide into three areas: the global divide, the social divide, and the democratic divide. The global divide explains the divergence of internet access between societies. The social divide explains the gap between the information-rich and information-poor within a society. The democratic divide concerns the differences between those who use digital resources and those who do not use it (Zillien, 2009: 90-92). This does not explain developments in rather ‘wealthy’ countries, or cultures where research often finds a certain level of hesitation in adopting technological innovations (cf. Fischer 2012).

The use of digital technology can be divided into “first level” or “first order digital divide” and in “second level” or “second order digital divide”. The former refers to the access gap, in terms of general usage of the internet or the usage frequency. The latter refers to the use, skills, and literacy with regard to internet-related technology (Friemel, 2016), (Cruz-Jesus, Vicente, Bacao, & Oliveira, 2015). Müller, Wachtler and Lampert (2020) also refer to these two levels, but also add a third one. They explain the differences in using digital technology to improve individual health (Müller, Wachtler, & Lampert, 2020: 186).

The aim of digitalisation should imply that everyone is able to create access, utilize and share information via digital means. Through the years, the understanding of new technologies has evolved from owning a computer to internet access and using a broadband connection. Today it refers primarily to the usage of online media (Cruz-Jesus, Vicente, Bacao, & Oliveira, 2015).

Research has shown that a gap exists between European countries regarding the aim of digitalisation. In Romania, for example, only 45% of the population uses the internet regularly, while in Luxembourg 93% are regular users. The reason is, among others, the socio-economic imbalance, which can be seen in the differences regarding income, age, and education. Education has a tremendous impact on ICT usage. People with higher education tend to use ICT more in professional and personal areas, and also tend to have fewer problems with the complexity of the technology (Cruz-Jesus, Vicente, Bacao, & Oliveira, 2015: 72-73).

Besides one is educational status there is also a difference between age groups. Whereas the educational status is an important factor for the younger generation, another impact appears when talking about the 65+ generation. Within this setting, the social environment has a greater impact on the digital inclusion or exclusion of this generation, as previous communication research shows (Fulk et al., 1990). Within this context, the literature also speaks of the “grey divide” (digital age gap). Older people tend to use digital services more if they are being motivated by family and friends (Friemel, 2016: 313-314), and can be seen in terms of social capital. It is even more important in this age group than economic capital. Friemel (2016) showed that social capital not only has an influence on internet usage but is also the main factor in this regard.

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## 3.6 Digital Literacy

Authors: Danijela Birt Katić, Jadranka Brkić-Vejmelka, Ines Cvitković Kalanjoš

If one has to list all basic skills that a child needs to acquire before enrolling in first grade, most of us will answer reading and writing. Even though this can hardly be questioned, it should be pointed out that in today's Digital Age, digital literacy, on the one hand based on literacy, is already taking precedence over these basic literacy skills.

It is important to clarify the concept of digital literacy in all its scope. In general we can say that it implies and incorporates different work skills; from working with software tools for word processing, spreadsheets and photos, e-mail, internet, and web browsers, to applications that

create presentations and access to online communication channels, as well as all other practical knowledge that helps us access existing digital content or in creating our own.

In the last ten years we have encountered several concepts that can replace, or rather complement each other, that sometimes appear and are used as synonyms: information literacy, computer literacy, library literacy, media literacy, network literacy, and finally digital literacy (in some texts the term digital information literacy is used). Much has changed since 1990, when the UN Declaration launched a 10-year program aimed at reducing illiteracy and at the same time generated and increased interest on the issue of literacy in the context of the emerging new information society.

During the 1990s a number of authors as an ability to read and understand hypertextual and multimedia texts has referred to the term "digital literacy". In that context, Lanham uses the term as being synonymous to "multimedia literacy". For him, literacy in the digital age, means the ability to understand information however presented, and in that sense digital literacy involves the skill of deciphering images, sounds, etc. as well as text. For Lanham it is crucial that we are aware of the difference between print and digital literacy (Bawden, 2001: 246). Digital literacy refers to a way of reading and understanding information that differs from what we do when sitting down in order to read a book or a newspaper. To put it simply, the difference between various types of literacy is inherent to the media itself.

The definition, which is used most often, is one from 1989, that defines information literacy as the ability of efficiently finding, evaluating, transferring, and generally using the information available through a wide range of media, which happens in the ever more complex information environment. The definition is broader than the notions of information and digital literacy, which are contained within it and create a precondition for the successful utilization of services and tools available via information-communication technologies (ALA, 1989 according to Novkovic Cvetkovic, Stošić & Belousova, 2018: 1091).

Paul Glistner was the one to popularize the term defining it as the ability to understand and use information in multiple forms from a wide range of sources when it is presented via computers (Martin 2018: 18). According to Glistner, there are four core competencies of digital literacy, invariant to technology changes: knowledge assembly, internet searching, hypertextual navigation, and content evaluation (Bawden, 2001: 248). Glistner goes so far as to define digital literacy as an "essential life skill", almost a "survival skill" needed to survive in the Digital Age that we are currently living in (Martin, 2018: 18).

An important element of digital literacy is the skill in using the tools available as well as critically questioning these tools as one uses them. This means recognizing and using their power, but also all threats and weaknesses that come with using these tools (Lapat, 2017: 50). It is Glistner who emphasizes this segment of digital literacy, which implies a critical understanding of the content versus technical competence, and singles it out as a key skill when talking about digital literacy (Martin, 2018: 18). For this reason, he considers digital literacy a life skill. Security is an extremely important aspect of accessing and searching for digital content and it is necessary to develop critical thinking in this area in order to successfully separate the content we need at a given time. It is extremely important to learn how to search safely because it can happen that we find fake or unverified content.

In addition to enabling or facilitating access to content, simpler processing, and processing of information, an individual should always keep in mind the ethical component when searching,

using, and sharing content. Browsing social networks, gaming, or using other social content resources are just a few aspects of digital literacy. It should be noted that digital literacy includes creating your own digital content, while web pages are just one of the possible types of content that can be created. In this context, digital literacy is considered an ongoing and dynamic process, and digital literacy depends on the requirements of a single person. (Martin, 2018: 20) emphasizes that it is most likely dependent on the needs of the situation: since digital literacy is connected with digital competence, it is something that is changing in content, related to rapid changes in the educational and technological landscape.

We can say that literacy is ultimately a relative concept, because as in traditional literacy, media literacy and digital literacy are not the same in Austria, the Czech Republic, Albania, or Croatia. Given that we live in a time when knowledge in the context of technology is changing and evolving rapidly, we need to react in the same way, ready and fast, all in order to slow down the generation of established models and differences.

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## 3.7 Digital Culture in Education

Author: Thomas Köhler

Digital culture is a concept that describes how technology and the internet are shaping the way we interact as humans or groups. Always a shared, collective phenomenon is learned from one's environment. One may narrow it down to mean for example: An organization or digital reality, which leads to focused concepts. Digital culture is the way we behave, think, and communicate within the current society (Gergen, 1991; Frindte & Geschke, 2019). In this interpretation, digital culture is the product of digital technology, which we are finding evermore around us - and is itself transformed through our use of technology.

Digital culture arose from covering cultural and social perspectives on information technology, electronic text and edition, semantic web, and the philosophy of networked knowledge society (Apollon & Desrochers, 2014). Following Hofstede (1984), a culture is "The programming of the human mind by which one group of people distinguishes itself from another". Meanwhile, due to the widespread distribution of technologies and practices, everyday life can be seen as digital cultural practice (Köhler, 2003). Nevertheless, such practice is not new and not restricted to *digital* technology (Bijker, Hughes & Pinch, 1987).

Additionally, digital culture is the result of technological innovation, and through the adoption of these innovations, has led to changing cultural practices for social entities (Fischer, 2012). Digital culture is applicable to almost any topic. Thus, it not only has a societal, but also an overarching, epistemological meaning (Koschtial, Köhler & Felden, 2021). It is to be expected that any

relationships between humans will also include a relationship with and via technology (Kahnwald, 2013; Köhler, 2021).

What does that mean for education? If we consider digital technology becoming a means of cultural practice, we should accept its relevance in the realm of education as well, especially in light of the recent corona pandemic. Obviously educational practices could have profited from the inclusion of digital media. However, only if a changing (dynamic) educational culture is accepted can it be considered innovative in terms of supporting accessibility and heterogeneity in any educational context, for example learning at home or without the support of teachers.

Inclusive educational practice may be in conflict with formal education, namely general and higher education, as it does not always have an educational mandate and is encouraged to submit innovative offers for social participation. Teaching at school and university - so that it is accessible to everyone - must be more clearly oriented and personalised to an individual's various learning skills and characteristics. In particular, digitally supported forms of micro learning may be offered. In addition, databased approaches to learning behaviour open up diverse, and above all, new methods of teaching staff – Learning analytics and tailored training (Köhler & Kahnwald, 2005).

It is suggested that the implementation of digital technologies within the educational system provides considerable benefits to educators by eliminating routine work and can additionally assist children with disabilities in fulfilling their tasks (Akhmetova et al., 2020). Yet to allow such a shift, digitalization and the use of artificial intelligence must be mastered, leading to new teaching concepts (Köhler et al., 2019). Thus, some attention is given to modularized online-based formats for the individual. Therefore, modularized online-based formats for the further, individual development of teachers, must be taken into account in order to prepare them for inclusive educational practice (Akhmetova et al., 2020; Open School Doors Project, 2019).

While recent research deals, for example, with the user experience and the usability evaluation of personalized adaptive E-Learning systems (Hariyanto, Triyono & Köhler, 2020) as well as the function of peer groups in response to digital exclusion of older adults (Barczik & Köhler, 2019), it did and does not always systematically address the domain of digital culture. Moreover, developments are often driven by either technological opportunities or special conditions of a specific case. Yet, with the wide distribution of smart devices and their combination with new digital assistants and augmented technologies, the landscape of technical artefacts has become much more diverse, powerful, and ubiquitous (Moebert et al., 2019), i.e. influencing every activity in a very broad sense. Digital technology with a fine inclusive potential is everywhere (Zörner, Moebert & Lucke, 2017). Taking this assumption to mind, inclusive educational practice may serve as a concept to suggest a review of recent approaches in formal and continuous education, which apply digital technologies for inclusive practices. Resultantly, it is expected that both theoretical consideration and case-based practices may contribute to a broader image of an inclusive digital culture, providing evidence of effective measures and dysfunctional approaches as well.

Conceptually one may focus on educational technologies as an interface between computer science and educational science, ideally located to detect and reflect the potential application toward inclusive practices in an inspiring way. Yet, perhaps the most astonishing feature of digital culture is not the speed of technical innovation, but rather the speed by which society takes all of these for granted and creates normative conditions for their use. Within months, a new capacity becomes assumed to such a degree that, when it breaks down, we feel we have lost both a basic human right and a valued prosthetic arm of who we now are as humans. (Miller & Horst 2012: 28).

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## 3.8 Digital Queer Gap

Authors: Christa Markom, Magdalena Steger, Jelena Tošić, Yvonne Wandl

The Digital Queer Gap (DQG) is a subsequent form of the Digital Gender Gap, and refers to the difference and inequality in the access to and use of digital technologies. The key difference however, is that the DQG does not only refer to the difference between men and women, but takes into account the entire LGBTIQ+ society. Most importantly, the Digital Queer Gap is also used to describe the injustice faced by members of the LGBTIQ+ community (DiGiacomo, 2021). LGBTIQ+ is an acronym for the corresponding sexualities and gender identities. The individual letters stand for the following: L stands for Lesbian (women attracted to women), G stands for

Gay (men attracted to men), B stands for Bisexual (no preference for a particular gender), T stands for Transgender (gender identity is different from that determined and established at birth), I stands for Intersexual (people, who have physical sex characteristics that are not exclusively male or female) and Q stands for Queer (a collective term for people who are not cisgender, that is, people for whom the subjective gender coincides with the biological gender, or heterosexual) or Questioning (a term for people who are unsure of their sexuality and identity). The plus denotes all other sexualities and identities (Cherry, 2020).

Older LGBTQ+ people in particular have problems affording digital technologies and the Internet. Above all, low income and pension might prevent them from taking advantage of the many opportunities to get in touch with like-minded people through digital media and spaces. There are now many companies and organizations that want to enhance access to the digital world for people from the LGBTQ+ community and thereby reduce the DQG. One of these organizations is SAGE (DiGiacomo, 2021). SAGE is a New York-based organization that aims to help older LGBTQ+ people. SAGE provides service and programs through which LGBTQ+ individuals can seek help to better engage with and use digital media (SAGE, 2022). Another program is the Bohnett Foundation's Cyber Center. This program has approximately 60 locations in cities and at universities. Here students and young adults can seek information about LGBTQ+, learn about this topic, and also talk to other people about it. This is especially important for people who feel uncomfortable at home and are afraid of being "discovered" because they have not yet come out, or do not want to come out at all (DiGiacomo, 2021).

The Internet has played an important role in the development of LGBTQ+ communities. It serves as a tool that helps people connect, to building and joining networks, as well as to acquire information and knowledge about LGBTQ+ issues, as well as health and politics. Moreover, especially in recent years, it has become an important weapon in the political struggle to express, spread, and strengthen demands (Edri, 2019). However, LGBTQ+ members also face problems online. For instance, it is difficult to express one's sexuality and desired identity online, both in the sense of standing up for oneself and one's intimate preference and choice, but also in terms of informing about LGBTQ+ issues and encouraging other people to stand up for themselves. There are many standards and guidelines within social media that restrict or prohibit these activities. Additionally, posts in which LGBTQ+ people are supported are often reported and subsequently deleted, whereas homophobic, sexual, and transphobic posts remain online. The algorithm is often responsible for this injustice, as it cannot adequately distinguish between positive and negative posts and therefore often excludes LGBTQ+ members. For transgender people another problem has become apparent, especially in recent years, being that when registering on a social network, a real name is required. This is verified by means of documents, which one must upload. As long as transgender people have not officially changed their name and gender, they must provide their birth name, with which they no longer use to identify themselves with. However, if they indicate their new identity, the accounts will be blocked after a short time and they will lose any possibility of contact with new acquaintances. Another black spot on the internet is that it is increasingly common for people to create a fake profile in order to use it to track down people with a particular sexual orientation. This was the case in Egypt for example, where people were found who had a sexuality that did not conform to the norm and were then tortured and murdered. In order to prevent this, there are now specific apps and websites, which were created only for homosexual people. There are also demands from the LGBTQ+ community to be included in the production of apps and related policies (Edri, 2019).

Another example of discrimination against the LGBTIQ+ community, specifically queer men, can be seen in India. India was a British colonial territory and therefore the British colonial penal code prevailed there, which states that any sexual acts defined as unnatural are punishable by life imprisonment. This means, among other things, that homosexuality is prohibited. The Court passed this law on September 6th, 2018 (Kolmannskog, 2018). Despite these legal conditions, the topic of LGBTIQ+ and especially being queer is discussed in the print media and in films as well as TV shows in India (Dasgupta, 2017).

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## 3.9 Digital Age Gap

Authors: Danijela Birt Katić, Jadranka Brkić-Vejmelka, Ines Cvitković Kalanjoš

Comparing age gaps in digitalization differs through the world and even within Europe. For example, research showed that elderly Europeans use the internet less often than their American counterparts do. Similarly, there is a difference between western and northern Europe compared to eastern and southern Europe with the latter using digital services less often. Each country should enact laws and regulations that favour the spread of information and communication technologies and allow citizens the right to information no matter where they are. As a social aspect of overcoming digital inequality, awareness should be raised of the need to acquire skills in the use of new technologies and encourage vulnerable groups such as the elderly on the use of new technology.

For this reason, more and more research dealing with digital technologies is being done to try to understand the demographic picture of users, i.e. their age, gender, place of residence, level of education, and income are taken into account. It is believed that all these categories affect the digital divide i.e. inequalities.

One of the key factors influencing digital inequality is whether one possesses skills to use new technologies. Schaarschmidt et al. (2012) did focus on age differences and its meaning for acquiring a certain innovative digital culture as well as related educational activity of mostly younger people. Author Van Dijk emphasizes the most important skills: operational, formal, informational, communication, creative and strategic skills, and defines digital inequality as the difference in possession of the afore mentioned skills. Furthermore, in his text Dijk mentions

several levels of digital inequality: access to digital technologies, skills of using digital technologies, and the independent use of the technologies (Van Dijk, 2014: 140).

If we consider the matter as being a young vs. old relationship, we oversimplify it. The use of digital tools is influenced by several factors: gender, socio-economic environment, level of education, and location (rural-urban). The availability of networks, connectivity, and computers is also important, as well as the creation of the environment, sensitization of the population, and incentives, i.e. motivation to use. Therefore, non-formal learning and teaching the elderly (through courses and seminars) are common practices. An example would be offering free computer use courses organized by associations or other institutions (Zadar City Library is one possible example).

Many elderly, lacking the latest digital knowledge, are at risk of being left behind. There are some examples, especially during COVID-19 such as a woman, who had not set up mobile payment, and was left alone in the service centre at a loss. In another case, an elderly Chinese man without a phone was asked to get off the bus after failing to show the driver his health-status code via the app used at all public places. These incidents are strong reminders of the widening digital gap for the elderly (<https://bigthink.com/the-present/digital-divide-age-gap>).

Given the aging population, in Europe, China, and the developed world, the digital gap is a pronounced problem. Given the development of digitalization around the world, it is not fair or desirable to say that someone is “too old” for technology or that technology is only “for the young”. Globally, tech companies are trying to educate the elderly, giving them in-store support on how to make digital payments. Advanced technologies are being specifically adapted with the elderly in mind, with the goal of improving their quality of life, for example The Davos Agenda 2021.

According to Dimić-Vrkić (2014), we must be aware of the need for continuous investment in the education of young people as new technologies change and complement very quickly, while on the other hand we must raise awareness of the need for greater intergenerational solidarity to reduce all these divisions (Dimić-Vrkić, 2014: 421).

The generation gap in using digital services exists because younger generations are more open to using new technology but is also connected to one's education and cultural capital. When digital inequality is decreased, then social inequality is also decreased. (Krištofić, 2007).

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### 3.10 Digital Gender Gap

Authors: Christa Markom, Magdalena Steger, Yvonne Wandl, Jelena Tošić

The Digital Gender Gap (DGG) or Digital Gender Divide describes the difference between men and women regarding the possibility of participating in the digital world. This starts with different ways of accessing the internet, as well as using the internet via smartphones, the general ability to own a cell phone, and the resulting disadvantages in professional life (IGI-Global, 2021). In quantitative terms, the DGG is the difference between the proportion of male and female internet users in relation to the proportion of male internet users. This value is expressed as a percentage (Sorgener, Mayne, Mariscal & Aneja, 2018). Especially in the last two years, the COVID-19 pandemic has made the difference between men and women concerning digital participation even more pronounced. This is evidenced by the fact that gaps between men and women are reappearing that have already been closed (Global Gender Gap Report, 2021). The gender gap refers to the inequality between women and men in all areas of life. The Global Gender Gap Report uses the following areas to identify the gender gap:

- Economic Participation and Opportunity
- Educational Attainment
- Health and Survival
- Political Empowerment

(Global Gender Gap Report, 2021: 5)

When people talk about the digital gender gap, they usually refer to the gap in the use of digital technologies between women and men. This is also reflected in various articles and reports that talk about the difference between women and men, such as the UN report on the DGG among women in Africa, or the Global Gender Gap Report. What is missing here is a non-binary gender definition. According to Lüth, non-binary is:

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*"...a self-designation of persons who locate themselves outside the binary gender order, that is, who are neither (only) female, nor (only) male."*

*(Lüth, 2021: 281)*

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The assignment of a gender at the birth of a child is based on a dominant gender regime that is oriented towards heteronormativity and is only slowly deviating from the female-male dichotomy. In this context, social media such as YouTube channels, Instagram, or TikTok play a major role for young people, in which this topic can be exchanged. (Lüth, 2021)<sup>3</sup>

In general, women have more difficulty accessing the internet, and in this sense, they are disadvantaged. In terms of statistics and figures, it can be seen that especially in countries of the Global South and in countries with poorly developed infrastructure, and where women are excluded from many areas of society, the women (and girls) are strongly discriminated in terms of their access to the internet. Approximately half of the human population - 3.7 billion people,

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<sup>3</sup> More information on this can also be found in the text Digital Queer Gap.

47% - has no access to the Internet. Half of this population are women, which means that about a quarter of the world's population is disadvantaged in terms of internet access (UN Women, 2021). In numbers, this means that men are on average 21% more likely to have internet access (Hingle, 2021). Reasons for this massive inequality include the following:

- ▶ Women do not feel safe on the internet because harassment is more frequent.
- ▶ The infrastructure sometimes makes it impossible to have internet access.
- ▶ In schools, girls and women are not equipped with digital knowledge, as this competence realm tends to be attributed to the male part of the population.
- ▶ Women often cannot afford digital technologies (USAID, 2021).

In terms of usage behaviour, we also find gender differences. Women use the (mobile) internet more often for e-mail correspondence, to look at routes and maps, to obtain health information, and for personal communication and care work, whereas men inform themselves about the news or the weather, obtain information in the areas of sport, politics or finance, carry out job activities online, or listen to and download music. In summary, this means that women are more likely to go online for practical activities and tasks while men are online for entertainment (Fallows, 2005). Similarly, men and women behave differently when it comes to digital communication. The male part of the population participates more often in online discussions, whereas women tend to hold back here. One reason for this is the mentioned lack of security on the internet (EIGE, 2021). Women use online communication mainly to keep in touch with friends and family, while men interact with several different groups online (Fallows, 2005).

Even in statistics, differences can be found in usage, competence, and general ownership - broken down by region. The smallest Digital Gender Gap can be found in America with only 2% (Chisiza, 2017). Europe is close behind with 3% (Sarpong, 2021) and Africa has the largest DGG worldwide with 23% (Chisiza, 2017). When looking at internet usage figures by gender, we find large differences. In North America, the difference is almost imperceptible, where 90% of both men and women have access to the Internet and are online. In Latin America, on the other hand, only 60% of women and 65% of men have the chance to access the internet. The Digital Gender Gap in Asia depends on the region, which can be divided into South Asia, Central Asia, Southeast Asia, and East Asia. The biggest DGG can be located in South Asia and the smallest DGG can be found in East Asia. (Hingle, 2021). Australia has developed its own system and index, the Australian Digital Inclusion Index (ADII), to stay on top of their digital development. The higher this index, the more pronounced the digital inclusion. In 2019, the ADII was at 61.9 points. Again, there are numbers that illustrate the difference between women and men within the digital world. On average, women have an ADII of 1.8 points lower than men do. In terms of access to the Internet, men have an ADII of 88.2 points and women of 87.7 points (Thomas et al., 2019).

As mentioned at the beginning, in some parts of the world, the current COVID-19 pandemic has also further increased gender differences. Especially for women, who did not use digital technology before the pandemic, the costs are now even higher in gaining access to digital technology.

Due to the pandemic, everything has to work remotely and many domains, including workplaces, education, and social life, have switched to distance learning or home office. This is usually brought by digital technologies and internet use, which allows for staying in touch with each other across (national) borders. However, since women have less access to the internet and often cannot afford or otherwise obtain access, they are experiencing a great deal of discrimination in

the course of the pandemic. Social life, administrative, medical information, and advice are provided online, often leaving women dependent on their families to follow the latest research results and government measures (Aggarwal, 2020; USAID, 2021; Nefresh, Orser & Thomas, 2020). Another issue that has gained prominence since the onset of the pandemic is domestic violence. This can affect both genders but poses far greater problems for women. Although there are now dozens of homepages, hotlines, etc. to report domestic violence or talk to someone about it, women who have neither the digital literacy nor the chance to access the internet have a limited opportunity to get help, and sometimes not at all (Nefresh, Orser & Thomas, 2020).

As mentioned above, the Digital Gender Gap has consequences in the workplace as well, especially for those who are hindered or prohibited from accessing the internet. More than 90% of jobs worldwide require digital skills from their employees, which women cannot provide due to the lack of appropriate training (Plan International, 2021). Women and girls are therefore limited in their professional opportunities and as a result, greater barriers are created in their professional lives (UNICEF, 2021).

There are many different suggestions and ways to reduce the digital gender gap. Most of them agree on one point, namely that the first step towards improvement should be taken in schools. Schools are the first stations through which children and young people across gender(s) have equal opportunities to acquire digital knowledge. Furthermore, teaching in the (natural) sciences, also referred to as the STEM subjects, should generally be promoted<sup>4</sup> (Plan International, 2021; OECD, 2018; Sorgener, Mayne, Mariscal & Aneja, 2018; BMBWF, 2021). In addition, it is demanded that access to the internet is equally allowed and possible for everyone, regardless of origin, gender, age, religion, sexuality, and socio-cultural background. Thus, both the infrastructure and the affordability of internet and digital technologies should be improved (Davaki, 2018; OECD, 2018).

Another important point concerns network security. This must be changed under any circumstances so that girls and women no longer have to be afraid while being online. Here, for example, it is recommended that more research and data analysis be done to find out what needs to be improved. However, the data should also include different genders (Davaki, 2018; Sorgener, Mayne, Mariscal & Aneja, 2018). The fourth and last point refers to stereotypes. Various socio-cultural barriers and associated stereotypes make it impossible for women and girls to engage more with technology and the digital world. It is considered an important goal to enable both genders (and beyond) to deal with digital technologies and to be able to work in these areas (Davaki, 2018; Sorgener, Mayne, Mariscal & Aneja, 2018).

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<sup>4</sup> It is helpful here to promote teaching in the STEM subjects (mathematics, computer science, natural sciences, technology).

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### 3.11 Digital Worldmaking

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

Worldmaking, "making/shaping a world", is often related to the concept of "reality". However, this approach to worldmaking implies that at the same time there are worlds that are not real, but constructed or invented. Especially when speaking of online worlds, the term virtual world or non-real world is often used. Yet, the offline world can be constructed just as the online world can be real. Anneesh, Hall, and Petro (2012) describe the construction of a world as made out of networks and different layers: across art, media, and social practices. Thus, there is no such thing as an objective, universal world that is the same for everyone. The "real" world is that world in which a particular person lives in at a certain point in time. This can be both online and offline. (Aneesh, Hall, & Petro, 2012: 1-3)

A strict distinction between the offline and online worlds cannot be made. For many individuals, the digital world is a part of the offline world and cannot be separated. The communication- and social scientist Ahmet Atay (2021) talks about the fact that life and identities exist as well between the online world and the offline world. The everyday life of many people is shaped by the digital. In addition to social media, such as Facebook, Instagram, or Twitter, people also use digital technologies such as smartphones, laptops, or MP3 players. In recent years, the pandemic has also shown that aspects of everyday life that previously took place in the "real" world can easily be transported into the "digital" world. Online classes or work meeting via ZOOM blurs the line between the real and digital world. (Atay, 2021)

In addition to social media, so-called "virtual realities" are also part of the digital world. Virtual realities are used, for example, to help children with autism cope better with challenges in the offline world. Virtual reality can be used to practice dealing with different situations in the "real" world in a safe environment. Sometimes virtual reality also contains an image of the "real" world. However, a completely new world can also be built. (Bellani, Fornasari, Chittaro, & Brambilla, 2011) That similar activities are possible online as in the offline world is shown by computer programs, the so-called "Second Lives". Users create an avatar with which they "live" in a certain environment. The idea is to do the same as in the offline world. Different users meet and go to the cinema, to dance classes, or to a café. Therefore, it cannot be called a computer game, because there is no final goal to achieve, but a (second) life is built and lived. (Boellstorff, 2015) As mentioned, users design their own avatars. Among others, this benefits people from the LGBTIQ+ community, as identities can be changed more easily than in the offline world. Therefore, the identity one adopts online can sometimes be closer to one's own "reality" than the one they have in the offline world. (Boellstorff, 2015)

In his article, Atay (2021) also focuses on queer identities in relation to the digital world. According to him, the online world brings entirely new ways of negotiating and expressing issues of queerness.<sup>5</sup> Atay calls this "digital queer worldmaking". As a mode of digital activism and empowerment, he sees the digital world as a new way "...to empower silent and marginalized queer and trans voices within our discipline." (Atay, 2021, p. 183)

People imagine the world from different perspectives and think about the world as a whole. The reflections, ideas, and understanding of the world always happen from a certain perspective. The idea of how the world is ordered can be through political systems, religious ideas or a connection between different parts, elements, spaces, and times. (TRANSCA, 2022) This also manifests in the links between the online and offline world. As described above, they are not separate, but condition each other and sometimes-even overlap. Life in different collectives and groups can also be conceptualized differently. Examples of this are the "Second Life" or groups on social media where people can exchange ideas and experiences.

In summary: when we speak of "worldmaking", we must take into account both the offline world and its intersections with the online world.

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<sup>5</sup> For more information see Digital Queer Gap

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## 3.12 Digital Transformation

Authors: Robert Kleemann, Thomas Köhler

Digitalisation is leading to a change in cooperation. Initial conditions are changing rapidly in all sectors, also in Europe. How can we reach the target groups of education? Which formats are sustainable and economically feasible? Which developments can we consciously address? Teachers and learners are currently gaining experience with the digital transformation of education on an almost daily basis. New media concepts such as CoP (Community of Practice), MOOCs (Massive Open Online Courses) or OER (Open Educational Resources) represent only a small selection of new forms of cooperation in the context of digitalisation. However, the idea of a digital transformation for knowledge cooperation, also with and between society, education and industry, is still not given enough attention and its importance is not understood (Köhler et al., 2019).

What is it about? Digital transformation can be seen as the ongoing process from the beginning of digitalisation to "full digitality". The basis of the transformation is the digital infrastructure and digital technologies, whereby the process goes hand in hand with the digital transformation and, in addition to industrialisation 4.0, also refers to an overall societal development towards society formation 5.0 (Blossfeld et al., 2018). For teachers, this means that they have to network with each other and that the use of digital media leads to increased cooperation (Seufert, 2018). With regard to digital competences, a basic distinction can be made between two requirement situations:

1. shaping the digital transformation of one's own profession and
2. the co-design of the digital transformation of the entire organisation

Seufert et al. (2018) understand the digital transformation in the school context as a systematic process. The starting point is the stage of digital education in predominantly informal and separate worlds, with rigid organizational structures for educational processes, which in a next stage is digital sovereignty as the main goal of digital education with then new organizational logic in the form of integrated learning in a (also legally protected) digital connecting room. In the final stage of development, personality development in a new social formation is in the foreground, it is about "personalized intelligent learning in an ecosystem with certified network partners" (ibid., p. 178, translated by author).

In the context of the digital transformation, will schools be more strongly or newly networked with society? Cress et al. (2018) describes that currently schools can hardly keep up with the high speed of digitalisation. Rather, schools must be enabled to become active shapers of the transformation themselves.

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## 3.13 Digital Storytelling

Authors: Danijela Birt Katić, Jadranka Brkić-Vejmelka, Ines Cvitković Kalanjoš

Digital Storytelling is the idea of combining the art of telling stories with a variety of digital multimedia, such as images, audio, and video. Digital stories bring together a mixture of digital graphics, text, recorded audio narration, video, and music to present information on a specific topic. As is the case with traditional storytelling, digital stories revolve around a chosen theme and often contain a particular viewpoint (Robin, 2011). Aline Gubrium defines digital storytelling as an innovative community-based participatory research method, that enables community members to participate more actively in studies relating to local issues (Gubrium, 2009: 5). It is a bottom-up approach that while in the process of policy making, those that are part of the community, have an opportunity to construct and represent their own experience (Gubrium, 2009: 8).

In his trainings Joe Lambert, co-founder of the Centre for Digital Storytelling (CDS), a non-profit, community arts organization in Berkeley California, assists people interested in creating and sharing their personal narratives.

The CDS is also known for developing and disseminating the Seven Elements of Digital Storytelling: (1) Point of View – what is the perspective of the author?, (2) A Dramatic Question – a question that will be answered by the end of the story, (3) Emotional Content – serious issues that speak to us in a personal and powerful way, (4) The Gift of your Voice – a way to personalize the story to help the audience understand the context, (5) The Power of the Soundtrack – music or other sound that support the storyline, (6) Economy – using just enough content to tell the story without overloading the viewer with too much information, (7) Pacing – related to Economy, deals with how slow or quickly the story progresses (Robin, 2011: 2).

In his paper titled, “The Educational Uses of Digital Storytelling”, Robin presents a categorization of digital stories and accordingly sorts them in three major groups: (1) personal narratives which incorporate stories that contain accounts of significant incidents in one's life, (2) historical

documentaries which include stories that examine dramatic events that help us understand the past, and (3) stories designed to inform or instruct the viewer on a particular concept or practice (Robin, 2011: 2).

Not only in education, can Digital storytelling be used to facilitate discussions about difficult but current issues such as “race”, multiculturalism, pandemics, and globalization. One of the proposed examples to implement is titled “Almost Paradise”.

([http://digitalstorytelling.coe.uh.edu/view\\_story.cfm?vid=244&otherid=featured&d\\_title=Featured%20Digital%20Stories](http://digitalstorytelling.coe.uh.edu/view_story.cfm?vid=244&otherid=featured&d_title=Featured%20Digital%20Stories)).

According to Robin, stories that are created in the digital world, through digital storytelling, allow users to share their work and communicate about it with other stakeholders closely connected to the respective project, and others interested in the topic. The very way of creating a story through digital storytelling, enables the participation of students with different learning styles, and as the emphasis is on group work, it is an opportunity to strengthen and develop several types of literacy: digital literacy, visual literacy, information literacy, etc. (Robin, 2011).

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## 4 Didactic Tools and Applications

### 4.1 Digital Inclusion

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

Depending on the social environment, one is inhabiting, working or studying in, digital inclusion can be defined in various ways. Digital inclusion refers to the ability of individuals and groups to access and use information and communication technologies regardless of their gender, age, socio-economic position, location, language, physical challenges, etc. Besides the numerous advantages that accompany the usage of digital media, there are also aspects of exclusion. Like in many other areas, there is a digital gender gap as well as a digital queer gap, which plays out in different ways and to different extents across the world.

#### What is it about?

Teachers should analyse a website they like. This can be their own schools or another website. You can choose whatever you like. It should be analysed with regard to (digital) inclusive aspects. There will be a framework provided by the DIGITclue project team.

#### Try it out

As a first step, read the concept about Digital Inclusion on the HUB and make notes what digital inclusion refers to. Then analyse a website based on the concept Digital Inclusion and the framework. Present the results via an online tool in the classroom and discuss it with the students. Let them suggest what could be changed. Pick one aspect together with the students and make a suggestion how a change can be realised.

Alternative: Analyse the website together with the students.

Suggested Apps: Mural, Prezi, Power Point

#### Tell your colleagues

After creating the whiteboard and extending it with the students, you can share your work with colleagues all over the world. For this, you can share the whiteboard on the Digital Inclusion Map on the Website of DIGITclue. The D.I. Map is a map of the world, where users can share projects, materials, ideas, and comments on digital inclusion in their own country.

#### Thinking further

You now have discussed and thought about Digital Inclusion from your own perspective, as well as from the perspective of the students. We invite you now to change your perspective and think about it from another perspective.

#### Example 1

You have learnt that Digital Inclusion can mean and define different things, in different contexts. You know the ideas from your students as well as your own approach. Think about how a six-year-old child versus a person of eighty years would define Digital Inclusion? Do they differ from each other or are they similar? In which aspects would they differ from your own definition of Digital Inclusion?

Optional: Do you know an 80-year-old person and/or a six-year-old child, maybe in your family or the neighbourhood? Ask them how they would define Digital Inclusion and compare it with the idea you had.

### Example 2

In addition, between disciplines there can be differences in how Digital Inclusion is defined. How would a sociologist describe Digital Inclusion and how would a computer scientist describe it? In which aspects would they be similar and which aspects would be different?

## 4.2 Inclusion

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

In today's society, people are often discriminated against because they do not look or behave according to societal norms. Everything not corresponding to the "norm" is seen as (too) different and often associated with negative attributes. Lang-Wojtasik & Schieferdecker employ a broad definition of inclusion, as they define it as the right of participation within the society, independent from an attributed or official status. Within this definition, everyone should get the help needed in order to move forward in life. It is important that the individual does not have to adapt to society, but rather society adapts to the individual. Here, inclusion refers to the unlimited participation in every aspect of society, independent from the individual condition.

### What is it about?

The basic idea is to create an audio collage, made by the students. The aim is to include children in the teaching process and to show that teachers can also learn something from their students. The topics can be related to Digital Inclusion, but may also differ, which is important for the students to talk about.

### Try it out

Read the concepts about Inclusion and Digital Inclusion on [www.digitclue.net](http://www.digitclue.net). Note the most important aspects. Concentrate on the concept of the "voice" as a possibility of inclusion. Explain the two concepts as well as the idea of "voice" with the help of a mind map. After that, the children should think about and prepare in groups, what they can teach their teachers. It can be any topic they want. It can be something they do at home or a topic that is important to them now. In the next step, the children should present their topics to the teachers and teach them something new. The idea is that children are often not heard in the process of teaching and therefore excluded. Teachers are not only able to teach, but also to learn something in a classroom. With this tool, children should be included in the teaching process and the reciprocity of learning and teaching should be highlighted.

After talking about the individual topics, the children should record their presentations with the audio editor "audiomass". You can find the program under this link: <https://audiomass.co/>

With this program, you can collect the presentations and ideas from the pupils and make an audio collage out of it. There are two options how it can be realised.

1. Record the presentations of the children with your smartphone, transfer it to your computer and upload it in the program under the button **file ► load from your computer**. You can string them together and create the audio collage. You can save and download it under the button **file ► Export/Download** and create an mp3-audio format.
2. Record the presentations of the children directly with your computer in the program. For this, you have to click on the red button in the menu or via the button **file ► New Recording**. A new window will open, where you have to select “**Start Recording**”. When the first group is finished, you can select “**pause**” or start a new recording. You can save and download it under the button **file ► Export/Download** and create an mp3-audio format.

### Tell your colleagues

After finishing the steps, you can share the audio collage on the website [www.digitclue.net](http://www.digitclue.net). For this, you can upload the created collage on the Digital Inclusion Map on the Website of DIGITclue. The D.I. Map is a map of the world, where users can share projects, materials, ideas, and comments on digital inclusion in their own country.

### Thinking further

You now have thought and discussed about inclusion from your own perspective, as well as the perspective of your students. Now we invite you to think about this topic from another point of view.

Depending on the context and the situation a person is living in, inclusion can mean different things. Below you can find a list of individuals. Think about how each of them would describe inclusion. What would be important for each of them? Would it be all the same or can you imagine differences?

1. A Spanish-speaking person, who lives in South Korea
2. A seven-month-old baby
3. A dog living at a cat shelter
4. A woman living in France in the 18th century
5. A non-binary person
6. A figure in a video game

## 4.3 Digitalisation

Authors: Danijela Birt Katić, Jadranka Brkić-Vejmelka, Ines Cvitković Kalanjoš

Digitalisation is a process that includes the transfer of various contents such as text, photos, sound, and video into a digital record. This is precisely why digitalisation is considered a way of protecting, archiving, and sharing created content. It is important to point out that digitalisation should also encompass the creation of inclusive environments in which everybody can be involved, it enables open communication, and has accelerated the process of creating and exchanging knowledge (Martinoli, 2019).

## What is it about?

The digitalisation process strongly affects education at all levels. It enhances the creation process of new teaching materials that are used in classes, which take place live, online, or hybrid. The students' motivation is a challenge in any time and context. We consider digital tools and apps helpful in this sense, and we tried to consider different aspects of "going digital" in the context of education. The need for digital materials and digitization of education was highlighted during the Covid-19 pandemic. This accelerated the processes that started earlier, but at this moment attention is placed on those members of the community who were not able to participate equally or use all benefits that digitisation has to offer.

## Try it out

### Example 1

Before you read the extended version of the concept digitalisation, you can make a concept map together with your students. This will help you to familiarise yourself with the alternative visions and ideas about the concept "digitalisation" that you and your students might have. The idea behind making a concept map is that you do not describe the meaning of the concept to students, but rather get an understanding of each student's perception. After you prepare the concept map, you can read the extended version of the concept on [www.digitclue.net](http://www.digitclue.net) and compare together, the definitions and ideas you had prior to reading the written concept.

A concept map helps in the process of building knowledge. The students will have to think about what they already know, how they understand the meaning of digitalising, and maybe become aware of any lack of knowledge or words to explain it, showing that sometimes we take the process of digitalisation for granted and don't understand it at its core. The concept map can help you connect different data and information you have about the concept. Additionally, you can continue building on it, combining existing knowledge and new information you come up with. We recommend the Popplet Concept Maps (<https://www.popplet.com>), but you can use the ones you are best familiar with (Mural, Power Point, Coggle, Mindmeister or any other tool for mindmaps available online, etc.).

### Example 2

#### Digital courses in education

Ask students if and why they have taken an online course. Let them list which and what was most useful to them. Discuss the advantages and disadvantages of this type of teaching. Try to find online courses on different platforms (Coursera) and direct students to register. Divide them into groups, where each group chooses a different course on the topic of digitization and how it affects education. Attending different courses is necessary in order to later compare the differences and similarities of the performance and teaching of the chosen topic. Students can take notes while taking courses to share together within the group. It is important to record your reflections on digitization and its effects on education at the very beginning of attendance, but also as the course progresses. After completing the course, you discuss the notes together and reflect on the future of education. After the discussions, it is recommended to make a digital poster about online courses, their advantages and disadvantages, using the Canva tool (Canva, Piktochart).

### Example 3

Start a discussion with students about the positive and negative effects of digitization on their health. Once they have written down their thoughts, you can share them through the Mentimeter digital tool (<https://www.mentimeter.com/>) and talk about it.

The next step can be a collaborative creation of a social game with the theme “How does digitization affect your health?”. For this purpose, you can use the DeckToys digital tool (<https://deck.toys/>). When creating the game, you go through all the steps together, from choosing the background, the track, or the idea for the questions or obstacles that you will design, that the player must solve in order to move on the board. Students have to design puzzles or tasks for the players that will answer the basic question of the game. After designing the game, you can share and develop the idea with students from other classes.

### Example 4

Discuss with the students how they search and download materials from the Internet when creating their presentations or posters. For example, when they make a poster or presentation, do they download photos or some other materials without considering the copyrights? Are these materials allowed for download, or is there an indication under what conditions the use of these materials is allowed. Explore together what the Creative Commons license is.

Consider the questions together:

- ▶ Are we allowed to download just about everything on the Internet?
- ▶ How can copyright be protected in the digital environment?

### Tell your colleagues

The examples you create working with your students can be shared in any case with colleagues in your collective, but we would like to suggest that you share it via the Digital Inclusion Map on the Website of DIGITclue. The D.I. Map is a map of the world; you can enter your own projects, materials, ideas, and leave comments on digital literacy in your own country.

### Thinking further

This part is imagined to take you a step further, to think together with your students completely outside the framework of the context in which you live and create.

- ▶ Think about if the process of digitalisation would be reversed. That the world from now on develops in a way that we quit using IT technologies. What would this mean for their everyday life, for their free time? How would they organize it? How would they imagine informing themselves about the world without social media, Internet, and the like?
- ▶ Imagine that you and your students use a time machine to transport yourselves to the 1960ies. Can you imagine talking with people, teachers, and students of your age and explain to them that in the future they will communicate with wireless phones and use video calls with colleagues from other parts of the world?

## 4.4 Cyberethicss

Authors: Robert Kleemann, Thomas Köhler

Cyberethics is the philosophic study of ethics pertaining to computers, encompassing user behaviour and what computers are programmed for, and how this affects individuals and society. Any didactic modelling of digitally processed perception, construction, and evaluation in education, has to consider ethical perspectives. In any educational technology (ed-tech) system, ethics are nowadays considered as highly relevant. This orientation may focus on ethical, anthropological, legal (to a lesser extent), and social aspects of socio-technical arrangements. In consequence, educationalists should be prepared with comprehensive (media) didactic expertise.

### What is it about?

The aim of the exercises is to gain a deeper understanding of the fact that people also write "with ink" on the Internet. Teachers and students should realise the impact of their user behaviour and at the same time develop a more inclusive way of dealing with each other. Furthermore, a (first) sensitisation with regard to the individual needs of pupils should be achieved. Please read the concept on Cyberethics from the DIGITclue project website, before you start with the examples.

### Try it out

#### Example 1

- ▶ Think about what cyberethics means to you before and after reading the texts.
- ▶ Develop a Learning Snack (<https://www.learningsnacks.de/#/welcome>) for your students to introduce the topic to them.
- ▶ After they have used the snack, discuss the differences and similarities with the offline world?

Cyberethics can mean, in a simple sense, that there is a reflection on the responsibility in dealing with information. However, children and young people often find themselves unconsciously in a so-called "filter bubble" in connection with social media and platforms. Recognising this fact and breaking out of this filter bubble can strengthen the understanding of responsibility in dealing with moral values and other users on the Internet.

- ▶ Discuss with your students if they feel they are in such a filter bubble.
- ▶ Test yourself at <https://www.filterbubble.lu/> and find out how likely you are to live in a social media filter bubble.
- ▶ Think about the pros and cons of the filter bubble. Does it limit your "life" in social networks?

#### Example 2

In the context of teaching scenarios, hybrid formats (meaning here the mixed form of face-to-face and online teaching), can help students with proven indications (e.g. autism, social phobias, etc.) to overcome their inhibitions and to effectively use their strengths without the latent pressure of a peer group.

- ▶ List possible barriers that could arise from face-to-face teaching in the context of the peer group. Either choose a scenario you have already experienced, or use an indication from the example.
- ▶ In your opinion, are there effective possibilities to include people with corresponding indications in everyday teaching, and if so, which ones? How can these be implemented?
- ▶ Discuss with your students how inclusive teaching could be implemented in offline and online form for the group mentioned. Develop an appropriate lesson plan and present it with a padlet timeline. Consider possible challenges in the participatory form of lesson design and which form you would use for the scenario.

### Tell your colleagues

Generally, sharing positive and negative experiences of digital inclusion and in particular examples of it in use helps others to educate themselves and raises awareness. Users should share their experiences with their colleagues and thus increase the reach of the topic. Therefore, the project aims to establish a sharing platform that makes these experiences visible (anonymously) and offers the possibility to exchange projects, materials, ideas, and comments from their own country, as well as worldwide. This platform will be available as a "D.I. Map" (Digital Inclusion Map - inspired by the "Queering the Map" project) on the DIGITclue project website.

### Thinking further

However, the development does not have to and should not end here. The users are encouraged to create their own projects and to adopt other perspectives, which can be chosen freely and vary according to the target group. The goal is a complete education and barrier-free coexistence in the context of (digital) inclusion. Often, rules for communicating with each other are developed and laid down in a participatory manner within the class framework.

- ▶ Are these also developed in the context of online lessons?
- ▶ In addition, if so, what would these rules look like?
- ▶ What special features do you think should be taken into account?

## 4.5 Digital Divide

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

Today people must deal with the digital world in many parts of daily life. Areas such as healthcare, school, banks, government, and libraries are using ICT (information- and communication technology), which thus becomes a necessary instrument for citizens to use the respective services. In order to do this, they must know how e.g., to use and access internet browsing, emails, blogs, or social networks. However, not everyone has this knowledge. That is how the Digital Divide or digital gap appears.

### What is it about?

As a first step, teachers should read the concepts of Digital Divide, Digital Age Gap, Digital Gender Gap, and Digital Queer Gap on [www.digitclue.net](http://www.digitclue.net). They should note the most important aspects as well as focus on topics, which are important for their students. In the following examples, you can find different tasks that you can try to think about. It is possible to do it on your own, as well as with your students.

## Try it out

### Example 1

Use Apps like Mural or Power Point to create a mind map, which shows the differences and similarities of the concepts you have read. Discuss the mind map as well as the concepts with your pupils. You can use the following questions:

- ▶ Which reasons can you imagine people not having access to digital media?
- ▶ Can you imagine any situation, where people actively do not want access to digital media?
- ▶ Which people may have difficulties using digital media?
- ▶ Is there something you would add to the concept of Digital Divide or an aspect, which is missing?

After discussing the concepts in class, the pupils should think about the statements made in the written concepts of Digital Divide, Digital Age Gap, Digital Gender Gap, and Digital Queer Gap. From their own point of view, can they confirm what the concepts are saying about the different gaps, or did they face other situations? For example, is it true for their family, that the younger members can use digital media in a more extensive way than the older ones? The idea is to reflect on the statements and see if they are true in the context of the pupils' lives or if they are prejudices.

### Example 2

Before reading and/or discussing the concept of Digital Divide, the students should work with the term in an artistic way. The pupils should present the concept of Digital Divide, as well as their own experiences and thoughts on it, graphically. For that, they should use the program "Paint", which is often preinstalled on computers. As an online tool, you can use "Tinyimage", which you can find under the following link: <https://www.tinyimage.de/>. Alternatives could be "PowerPoint", "Word" or "Adobe".

After drawing/painting the term, the pictures should be discussed in class. The students should explain what they have thought about. As a last step, the teachers should present the concept of Digital Divide on [www.digitclue.net](http://www.digitclue.net). In class, there should be a discussion on both the differences and similarities between the concepts on the website and the ideas from the pupils.

### Example 3

The concept of Digital Divide should be presented and discussed in class. For better understanding, it is possible to also present the concepts of "Digital Gender Gap", "Digital Queer Gap" and "Digital Age Gap". For this exercise, it is important that the students know what Digital Divide is about. After that, the pupils should think about one person, who is affected by the Digital Divide (it can also be a person, who voluntarily chooses not to use the Digital). The pupils should write a short story, from the person's point of view, describing the situation, the reasons, the feelings, etc.

## Tell your colleagues

After working with and discussing on the concepts with the students, you can share their creative work with colleagues all over the world. For this, you can share the created art on Digital Divide on the Digital Inclusion Map found on [www.digitclue.net](http://www.digitclue.net). The D.I. Map is a map of the world, where users can share projects, materials, ideas, and comments on digital inclusion in their own country.

### Thinking further

You now have thought and discussed about the Digital Divide from your own perspective, as well as from the perspective of the students. You have learnt that the Digital Divide means something different for everyone. Depending on the people, the Digital Divide causes other challenges. Now we invite you to think about this topic from another perspective.

- ▶ Imagine meeting a person from the 17th century, who does not know anything about new technology and the Digital Divide. How would this person see our digital world and the Digital Divide? Which questions could he or she have, and how would you answer them? Can you think about some advice for this person, how he or she could avoid the Digital Divide when returning to the 17th century?

## 4.6 Digital Literacy

Authors: Danijela Birt Katić, Jadranka Brkić-Vejmelka, Ines Cvitković Kalanjoš

Digital literacy is often considered as one of the essential skills for the 21st century. In the context of education, it includes not only the use of digital tools in teaching, but also serves the purpose of developing creativity, which aims to refine the teaching process and facilitate the acquisition and expansion of students' knowledge. It should not be seen as a substitute for the learning process that takes place in person, nor is it a substitute for the written word. Digital literacy should be considered to open and enable the engaged work of teachers and students, during and outside the teaching process. In addition to the knowledge of how to use digital tools, digital literacy also implies the knowledge and certainty of choosing the “right” tools. Creating a safe environment in the digital context is something that teachers can create for the students involved in the teaching process, as well as for them to use the knowledge outside the classroom.

### What is it about?

To start with the application of the digital tool we recommend that you read the concept on Digital Literacy. The concept is written in such a way that it is interlinked with other concepts important to understanding the broadness of the digital literacy, but also in a way that it gives your ideas about how digital literacy is separate from media literacy and other similar terms. We should constantly be reminded that digital literacy includes knowledge of software skills as well as “soft” skills on how to use content on the Internet in a safe manner.

### Try it out

Digital literacy does not only mean access to media content that is published, more important is the knowledge that it includes the ability to analyse, evaluate, and create content. Accordingly, we will propose examples that you can use when teaching the topic of digital literacy in your subjects. In the Croatian context for example, media literacy is taught in the Croatian language, but it is limited to only a few hours throughout the school year, it is possible that in other contexts there are similar policies of teaching and comparable forms of literacy.

### Example 1

Read the concept Digital literacy on [www.digitclue.net](http://www.digitclue.net). Imagine a person who is digitally illiterate. According to the material you read, write short instructions using Word, Power Point or a collaborative tool (Google Docs, MS Teams) for that person on how he/she can protect his/her personal information in an online environment.

- ▶ Do you consider yourself digitally literate? Write five skills what would make you a digitally literate person.
- ▶ Discuss the ethical issues regarding the sharing and posting of other persons information online.

### Example 2

Ask the students to list and in short define other types of literacy they are familiar with. Try to compare other types of literacy to digital literacy. Discuss similarities and differences between a specific type of literacy and digital literacy. Additionally, do an exercise with the students.

Together, try to find information about a specific topic using an Internet browser and then do the same using sources you have in the school library. Compare the information that you collected.

Talk with the students about which sources they use on the Internet to look for information. Let them give some examples. Do the same with the sources from the library. Talk to them about the problems they are having in doing so. Do they manage to get a concrete answer in each separately? Do they use to both compare and check the information they collect?

Divide students into pairs. Ask them to search for information about the meaning of digital literacy. One will search using Google/Yahoo, and other can use a specific search on the invisible web (using InfoMine, WolframAlpha). Compare the given results. They can repeat this exercise several times with different questions. Ask the students if there are any differences between the Google and InfoMine/ WolframAlpha and have them name them.

### Example 2a

Talk to the students about the internet search engine that they use the most it is probably Google. Wherever and however they use it, ask them if everything, they find there is reliable information, or if they additionally check the information, they find there, and in what way. Do they believe that if they want to get information, they can search the Internet as soon as possible? Is that enough to be able to conduct a seminar or some other kind of work? Is the information in the textbooks reliable? Is the information they get through television reliable? Can you judge which source of information would be the most reliable and why?

Do the students know all the services Google provides? Do they know what Gmail, Google Maps, Google Earth, Google Translator, Google Meet, etc. are? Have they ever used one?

Let us get acquainted with Google Translator. Is the translation we get there reliable? Choose one sentence and translate it from English to your language, and then from English to another foreign language. Compare the resulting translations and think about why certain translation errors occur. In which language are the fewest errors noticeable? Present and compare the results within the groups and think together when, to what extent, and in which language we can most rely on Google Translate. When listing and sharing information, use the online panel in Padlet. <https://padlet.com/>

### Example 3

Work with students on the topic of keywords; try to explain that searching on the web for information is in some cases limited by the fact that they did not “pick” the appropriate keyword. In addition, that sometimes in the open space of the Internet, choosing a keyword can lead them to content that is biased, misleading, and partial. Ask them to write five keywords for each concept on the digitlclue.net page (Inclusion, Digital Culture, Digital Literacy, Digital Transformation, Digital

age gap, Digital Divide, Digital Gender Gap, Digital Queer Gap, Digital Storytelling, Digital Worldmaking, Cyberethics, and Digitalisation). With the help of the digital tool WordSift, create a word bubble based on word use. It is designed as an interactive bubble in which words are turned into mini-digital databases that contain information about how to use individual words. It is connected to the word web thesaurus. <https://wordsift.org/>

### **Tell your colleagues**

The examples you create working with your students can be shared in any case with colleagues in your collective, but we would like to suggest that you share it via the Digital Inclusion Map on [www.digitclue.net](http://www.digitclue.net). The D.I. Map is a map of the world; you can enter your own projects, materials, ideas, and leave comments on digital literacy in your own country

### **Thinking further**

This part is imagined taking you a step further, to think together with your students completely outside the framework of the context in which you live and create.

- ▶ Try to imagine a person living in the 19th century. Can you explain to him what digital literacy is? Can you think of words you could use to explain the scope of digital literacy?
- ▶ Think of digital literacy from a perspective of a blind person and what it would mean for him or her to be digitally literate.

## **4.7 Digital Cultures**

Author: Robert Kleemann

A digital culture is a concept that describes how technology and the Internet are shaping the way that we interact as humans or groups. It is always a shared, i.e., a collective phenomenon, that is learned from one's environment. One may narrow it down to a certain context, for example an organization or digital reality, which leads to focused concepts. This means that a digital culture is the way (our everyday culture) we behave, think, and communicate within the current society.

### **What is it about?**

With the emergence and further development of "life in the digital sphere", a culture of its own increasingly developed, consisting of the most diverse groups and individuals, just as in the "real world". With this development, not only positive and negative aspects emerged, but also manners. The examples deal with the omnipresent phenomena of hate speech, cyberbullying and digital cultures and their manifestations. The aim of these examples is to prevent cyberbullying and, if it does occur, to have measures and patterns of action ready to effectively resolve the issue. Furthermore, an understanding of the existence and form of digital cultures, as well as their effects on everyday life, should be demonstrated and developed. Users should read the concepts on Digital Cultures on [www.digitclue.net](http://www.digitclue.net), as well as watch or listen to other formats, depending on the example and interest.

## Try it out

### Example 1

"Hate speech" and "fake news" have advanced especially in the context of the digital development of the world. In the context of peer groups and digital inclusion, "cyberbullying" is a familiar term among children and young people.

- ▶ Explain the term "cyberbullying" and show possible consequences for the individual.
- ▶ Discuss how to deal with the phenomenon of "hate speech". Research possible factors that lead the authors to use this form of communication. You can share your Experiences on the D.I.-Map.
- ▶ Develop a concept for dealing with "cyberbullying" with your pupils during a project week and have the pupils' research and contact appropriate contact points in order to raise awareness and strengthen the pupils.
- ▶ Create short videos using TikTok, Instagram, or Snapchat or digital posters using PowerPoint or Paint, to avoid or deal with the issue. Share your findings with others on the D.I.-Map and/or with an "offline" workshop performed by the pupils themselves or an online workshop by using, for example, the app GatherTown.

### Example 2

Our society is not only dependent on its members as individuals but also on groups existing or emerging within society. It is shaped and formed by them. This process is very dynamic in digital cultures and its offshoots reach far into the "offline realm". Think about how the aspect of "cultural difference" shows up within and between societies.

- ▶ Are there similar structures within or between digital cultures?
- ▶ What similarities and what differences do you see between cultures and digital cultures?
- ▶ What makes them different?
- ▶ Where do the digital and non-digital cultures have their points of contact or intersections?
- ▶ Create a Mural, a Miro or a MindMup on which your findings are depicted.

## Tell your colleagues

Sharing positive and negative experiences of digital inclusion in general, and the examples of use in particular, helps others to educate themselves and raise awareness. Users should share their experiences with their colleagues and thus increase the reach of the topic. Therefore, the project aims to establish a sharing platform that makes these experiences visible (anonymously) and offers the possibility to exchange projects, materials, ideas, and comments from their own country, but also worldwide. This platform will be available as a "D.I. Map" (Digital Inclusion Map - inspired by the "Queering the Map" project) on the DIGITclue project website.

## Thinking further

However, the development does not have to and should not end here. The users are encouraged to create their own projects and to adopt other perspectives, which can be chosen freely and vary according to the target group. The goal is a complete education and a barrier-free coexistence in the context of (digital) inclusion. Immersing yourself in the digital world through platforms like YouTube, Facebook, Instagram, TikTok, and co. can bring a completely new perspective to students' individual needs and wants. If you are not part of these communities yet, take heart and look with an educator's eye.

## Literature

Kleemann, R. (2021). *Von der Medienbildung zu einer Pädagogik der Digitalität: Trainingsansätze zur digitalen Inklusion; unveröffentlichte Staatsexamensarbeit*. Technische Universität Dresden.

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## 4.8 Digital Queer Gap

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

The Digital Queer Gap is a variation of the Digital Gender Gap, which refers to the differences and inequality in accessing and using digital technologies. It not only considers the differences between men and women, but the entire LGBTIQ+ community is considered. Some companies and organizations try to enhance access to the digital world for people from the LGBTIQ+ community and thereby reduce the DQG. The online presence of the LGBTIQ+ community on the Internet has great advantages, but also implies some difficulties.

### What is it about?

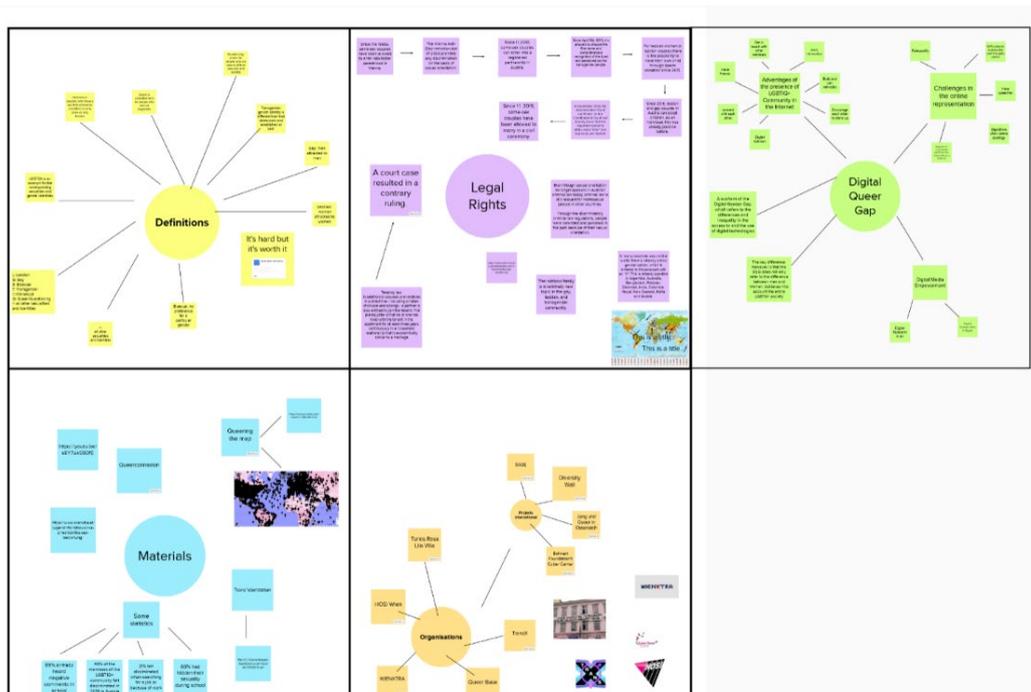
The basic idea is to create a digital interactive whiteboard, where teachers would create pins, notes, pictures, video, etc. The content should be created with the help of a list of questions and topics. This list is provided by the DIGITclue Team and can be found below.

The exercise should be done according to these steps:

#### 1. Research exercise for teachers (List of topics/questions):

- ▶ What does LGBTIQ+ mean?
- ▶ What does Digital Queer Gap mean?
- ▶ Where can you find material for this topic?
- ▶ Are there organisations in your town that are dealing with the topic of LGBTIQ+ and/or the Digital Queer Gap?
- ▶ What are the legal rights of the LGBTIQ+ community in your country?
- ▶ Where can you get help, if you are facing discrimination because of your belonging to the LGBTIQ+ community?
- ▶ How long do you have to travel to get support?

2. Design a whiteboard using the App “Mural”:



3. Present it in the classroom:

The whiteboard should be presented in the classroom to the students. Definitions, notes, organisations, etc. should be explained and discussed. The aim is to be as creative as possible and make the topic as interactive as possible.

4. Discuss the topics/questions with the pupils:

After showing the students the whiteboard, they should discuss it. What do they think about it? Which opinion/attitude do they have? What would they put on the whiteboard? What do they already know?

5. Extend the whiteboard with the ideas/wishes/approaches from the pupils:

Work on the whiteboard together with the pupils and add their ideas/wishes and approaches about this topic. If it is possible, the whiteboard should be shared and compared.

Try it out

Example of Digital Queer Gap designed with Mural:

<https://app.mural.co/t/DIGITclue4230/m/DIGITclue4230/1646046048724/68cc19702e8f2fee2e78230dbab95d879bd2035f?sender=u079be3b7cadea0eee8041391>

Alternatives: Power Point

Tell your colleagues

After creating the whiteboard and extending it with the students, you can share your work with colleagues all over the world. For this, you can share the whiteboard on the Digital Inclusion Map on the website of DIGITclue. The D.I. Map is a map of the world, where users can share projects, materials, ideas, and comments on digital inclusion in their own country.

### Thinking further

You now have thought and discussed about the Digital Queer Gap from your own perspective, as well as the ideas from the students. We invite you now to think further about this topic and collect some more insight into the Digital Queer Gap.

In the concept, there is a focus on older members of the LGBTIQ+ community. It is strongly connected with the Digital Age Gap. What about the younger generation? Can you think about some reasons why younger members belonging to the LGBTIQ+ community are excluded from the digital world? What could be the reasons for differences between older and younger people? Do you have some ideas on how the gap could be reduced for both?

## 4.9 Digital Age Gap

Authors: Danijela Birt Katić, Jadranka Brkić-Vejmelka, Ines Cvitković Kalanjoš

Digital age gap means that there are different starting points connected to digital tools based on the age of the users. Digitalisation varies when comparing different countries of the world including Europe. Different factors have impact on the digital tools used by elderly people: gender, socio-economic context, networks availability, education level, location (rural/urban), motivation, etc. Digital age gap is appearing very often, especially because the 65+ population is growing, for example in EU member states this demographic increased to 20.3% in 2019. At the same time, developing technology is offering new digital tools to overcome the age gap.

### What is it about?

To begin, it is advisable to read the concept on the Digital age gap. It can help explain the meaning of the concept. Many elderly without a grasp of the latest digital knowledge and skills are at risk of being neglected. Examples from everyday life are revealing the widening digital gap the elderly are experiencing. Teachers should take steps in order to make students aware of age gap in using digital tools. It could be a game of associations, where each student and teacher express the age gap problem through a particular picture or word, concept, or association. This could show us a variety of problems/aspects that we are maybe not aware of.

### Try it out

#### Example 1

Help your students to set secure passwords and download a password manager app on their devices so they do not have to remember all the passwords to log in. Look at their privacy settings on social networks and show them how to set their information so that only friends can view it. Review privacy policies for websites where they might shop, bank, or share healthcare information and show them that the benefits, in most cases, outweigh the security risks. Provide a notebook where to put log passwords and usernames.

- ▶ How do digital security issues affect our lives?
- ▶ Do elderly people need secure measures, and if so, why?
- ▶ What do you think about saving important words/passwords?
- ▶ What is the meaning of data security in digital world?

### Example 2

To help elderly people use digital tools and motivate them, share the idea to your students to persuade their parents, grandparents, or neighbour, in writing a letter to their family members (children, parents, and friends) via email.

- ▶ Do you find yourself capable of preparing teacher training for students?
- ▶ How is it possible to sensitize students for working and helping elderly people?

### Example 3

Let us use the internet! We can open an interesting page and start exploring. Try to find the most interesting topics for elderly people. Learn how to skip undesirable links, pages etc. Try to find an appropriate application for free digital learning (<https://seniorplanet.org>).

- ▶ Are you aware of any initiatives in your local community promoting digital literacy for elderly people?
- ▶ How much attention is your school paying to the topic of digital literacy, especially for older staff?

### Example 4

Some applications enable elderly to use digital tools more often. Because of possible problems, there are Voice-activated Internet of Things (IoT) home appliances for users with limited mobility or an AI-powered speech recognition system that can communicate in a variety of dialects. All of these things are improving communication, especially for older users.

- ▶ Do you find existing apps suitable for elderly users?
- ▶ Try to use some of those applications with your students and ask their opinion.
- ▶ How do you find yourself in this concept, do you have age gap problems?

### Example 5

Some exercises can be used with smart phones and smart watches in order to use very useful applications (pedometer), Fitbit (<https://www.fitbit.com/global/eu/home>), MyFitnessPal (<https://www.myfitnesspal.com>), and Health (<https://www.health.com/#main>).

We recommend starting with the simplest apps.

- ▶ Is it possible to follow (all) innovations in the digital world?
- ▶ Is it possible for your students to always be informed about the latest features? What is the difference between you and your students? Is there a difference?
- ▶ Do you find the increasingly faster improvement of digital tools frustrating?

### Tell your colleagues

Discuss digital age gap problems with your colleagues and students. What are the most common types of problems? Suggest short, monthly meetings (in person or online) to discuss recent/current issues in using digital apps.

The examples you create working with your students can be shared in any case with colleagues in your collective, but we suggest that you can share it via the Digital Inclusion Map on [www.digitclue.net](http://www.digitclue.net). The D.I. Map is a map of the world; you can enter your own projects, materials, and ideas, and leave comments on digital literacy in their own country.

### Thinking further

Try to think about the meaning of the age gap in the context of digital or what does it mean for an individual. If you are aware of the problem, do you know some other possibilities to escape the gap? Imagine yourself at a certain age and any possible problems that could arise when using digital apps.

## 4.10 Digital Gender Gap

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

The Digital Gender Gap (DGG) or Digital Gender Divide describes the difference between men and women regarding the possibility of participating in the digital world. This starts with different ways of accessing the internet, as well as using the internet via smartphones, the general ability to own a cell phone, and the resulting disadvantages in professional life (IGI-Global, 2021). Especially in the last two years, the COVID-19 pandemic has made the difference between men and women concerning digital participation even more pronounced. This is evidenced by the fact that gaps between men and women are reappearing that have already been closed (Global Gender Gap Report, 2021) the gender gap refers to the inequality between women and men in all areas of life.

### What is it about?

As a first step, teachers should read about the concept on Digital Gender Gap on [www.digitclue.net](http://www.digitclue.net). Note the most important aspects, so you can work with it during the next steps.

### Try it out

Create a worksheet for your students, so you can discuss this topic with them. You can also use or adapt the existing one, which you can find here. Parts of the existing worksheet are the Learning Apps, which can be used by the students. You can create your own Learnings Apps for this topic under this link <https://learningapps.org/>

You can choose between different options like multiple choice, gap texts, and more. If you want to use the Learning Apps without the worksheet, you can find them under the following links:

- ▶ **Word grid:** <https://learningapps.org/watch?v=pe1do8a3c22>
- ▶ **Crossword Puzzle:** <https://learningapps.org/watch?v=pcwd2a6at22>
- ▶ **Multiple Choice:** <https://learningapps.org/watch?v=p23u7e1bt22>
- ▶ **Gap text:** <https://learningapps.org/watch?v=puf9p1mq222>

Discuss the ideas and answers of the students together in the classroom.

### Tell your colleagues

After working on the concept with the students, you can share your created materials with colleagues all over the world. For this, you can upload them on the Digital Inclusion Map on the Website of DIGITclue. The D.I. Map is a map of the world, where users can share projects, materials, ideas, and comments on digital inclusion in their own country.

### Thinking further

You now have thought and discussed about the Digital Gender Gap from your own perspective, as well as from the perspective of the students. Now we invite you to change your perspective and think about the Digital Gender Gap in a different way.

#### Example 1

Imagine the Digital Gender Gap with swapped roles: Women are using the Internet more than men are. How could the Digital Gender Gap look like? Would it be the same or different? What could be the reasons, for women using the Internet more? How could this scenario come to life?

#### Example 2

In the Digital Gender Gap, there is only a definition for men and women. What is missing here is a non-binary definition, which avoids the dominant gender regime that is oriented towards heteronormativity. Think about the Digital Gender Gap from the perspective of a non-binary definition. How would the definition of the Digital Gender Gap change?

## 4.11 Digital Worldmaking

Authors: Christa Markom, Magdalena Steger, Jelena Tošić

Worldmaking, "making/shaping a world", is often related to the concept of "reality". However, this approach to worldmaking implies that at the same time there are worlds that are not real, but rather constructed or invented. Especially when speaking of online worlds, the terms "virtual world" or "non-real world" are often used. Yet, the offline world can be constructed just as the online world can be real.

### What is it about?

Firstly, educators should read the concept on Digital Worldmaking. As this concept is also linked to additional concepts, there is an opportunity to also read the concepts on Digitalisation, Digital Gender Gap, Digital Queer Gap, Digital Inclusion, and Cyberethics. Secondly, they should watch the video "Worldmaking" on transca.net (<https://www.transca.net/en/Videos>). Thirdly, some exercises should be selected including questions to work on it. This should be realised on their own as a first step, and then together with the students. While working with the students, the goal is that, they should independently consider what "digital" has to do with "worldmaking". The students should flesh any ambivalence they might feel between "online" and "offline" worlds, out independently.

### Try it out

#### Example 1

Research, which groups exist in the digital world? Where can you find them? Do the same or similar groups exist in the "real" world? What makes them different?

- ▶ How would you define *community* in the digital world?
- ▶ How would you define *community* in the "offline" world?
- ▶ Are there differences or are they the same?
- ▶ Are there aspects that exist only in the digital world or only in the offline world?

### Example 2

“Second Life” describes a kind of virtual game where you can build a virtual life. It simulates a world in which you can do the same things as in the offline world. You can choose which characters you want to represent, from adults and children to animals and mythical creatures. Within this world, you can do different activities, like dancing, going for a coffee with friends, or visiting a fashion show. The goal of “Second Life” is not so much to play a computer game, but to network, make friends, and build a social life. Many participants make no distinction between the online and offline worlds. For them, “Second Life” is as real as the offline world, because people eat together and even have relationships just as they do in the offline world. One of the inhabitants of this world describes it as follows: *“It’s the people who live here who make it real.”* (Boellstorff, 2015, p. 182)

Some questions to think about:

- ▶ How are the terms "worldmaking" and "digital worldmaking" dealt with here?
- ▶ Think about the concept in Second Life. Would it be “real” for you?
- ▶ What does the “real” world mean to you?

### Example 3

To help people with autism to better cope in the "real" world, there are various programs and therapies. One possibility is to use virtual reality to depict the offline world and thus promote communication and social interaction. This involves using computer programs to map either the real world or a completely new world. Within these worlds, people learn to develop skills that they can then apply in the "real" world.

- ▶ How can the digital world and the real world be distinguished in this example?
- ▶ Is it possible to clearly separate these two worlds?
- ▶ What are the notions of offline world and digital world here?
- ▶ How does this project influence the idea about the world(s)?
- ▶ What other concepts can be applied/seen here?

### Example 4

Read through the following concepts: *Digital Gender Gap* on [www.digitclue.net](http://www.digitclue.net) and *Othring* on [www.transca.net](http://www.transca.net)

- ▶ What connection can be drawn between the two concepts?
- ▶ What connection is there to "digital worldmaking"?
- ▶ Would you classify the aforementioned distinctions as being harmless or harmful?

### Example 5

In the digital world, there are standards and guidelines that users should follow. Especially in the field of media ethics, discussions are held about the „correct“ behaviour in many areas. Have a look at the following pictures and consider what the social norms and expectations are.



### Example 6

Cyberethics also contributes to the topic of norms and expectations within the digital world. Read the concept of cyberethics on [www.digitclue.net](http://www.digitclue.net). Then research the following terms: PAPA-model, netiquette, information security, privacy, intellectual property.

- ▶ How are these terms related to the idea about the (digital) world?
- ▶ Why are these terms important in the context of social norms?
- ▶ What is acceptable group behaviour in the context of social media?
- ▶ Are there social norms that are the same in both the online and offline worlds?
- ▶ Are there norms that are only applicable in one of the two realities?

### Example 7

Everyone has his or her own definition of digital worldmaking. Your students will also have different ideas of what the (digital) world looks like. Think about your own definition. Write it down on a (digital) whiteboard. Then have your students write down their own definitions.

### Tell your colleagues

After working and discussing some of the examples with the students, you can share your work with colleagues all over the world. For this, you can share whiteboards, notes, documents, and pictures, on the Digital Inclusion Map on the Website of DIGITclue. The D.I. Map is a map of the world, where users can share projects, materials, ideas, and comments on digital inclusion in their own country.

### Thinking further

You now have thought and discussed about Digital Worldmaking from your own perspective, as well as the perspective of the students. You have learnt that the world means something different to everyone. We invite you to think about Digital Worldmaking from a different perspective.

Imagine you are a robot with artificial intelligence. How would this creature describe the world? What is the imagined reality of the robot? Does it always have to be digital or can a robot also live in the “real” world?

## 4.12 Digital Transformation

Authors: Robert Kleemann, Thomas Köhler

Digitalisation is leading to changes in cooperation. Initial conditions are changing rapidly in all sectors, also in Europe. How can we reach the target groups of education? Which formats are sustainable and economically feasible? Which developments can we consciously address? Teachers and learners are currently gaining experience with the “digital transformation” of education on an almost daily basis.

### What is it about?

As a first step, users should read the concepts on Digital Transformation on [www.digitclue.net](http://www.digitclue.net), as well as watch or listen to other formats, depending on the example and interest. They should note the most important aspects as well as focus on topics, which are important for their students. After the exercise, the competences in dealing with digital tools should have been expanded or deepened. Furthermore, it should be shown how important participation is in the

teaching-learning process and how it promotes (digital) inclusion. The development and engagement with digital teaching and learning formats should generate benefit for all participants in the process.

## Try it out

### Example 1

The process of digital transformation is omnipresent and influences (high) schools in various areas. The term or the concept is individual in the different dimensions (macro, meso, and micro level) and requires a correspondingly differentiated consideration.

- ▶ With the help of a padlet timeline, develop a teaching sequence in which you carry out method training, and thus develop the method competence of your students, using these very tools.
- ▶ Evaluate with your students which and how they use digital media, social media channels, and similar formats in their free time by creating a mindmap. For example with the use of the app MindMup.
- ▶ Reflect with your students, to which extent the amount of their use affects their everyday life, and what consequences, positive and negative, may arise from it. Put all the findings on the mind map.

### Example 2

The school lives not only from its institutional framework, but also above all from its students. The younger generation in particular is the driving force for a digital transformation not only in the use of end devices but also in the development and participation in teaching formats and events.

- ▶ Develop the school of the future with your students using a 'future workshop' where anything is possible. Use the apps [Miro](#) or [Mural](#) for an effective display.
- ▶ Then work out with them the framework of the current situation and which of the previously conceived concepts and ideas are now possible.
- ▶ Think together about what has to happen so that all ideas can come true. Which ones cannot be implemented and why?

## Tell your colleagues

Generally, sharing positive and negative experiences of digital inclusion and in particular examples of it in use helps others to educate themselves and raises awareness. Users should share their experiences with their colleagues and thus increase the reach of the topic. Therefore, the project aims to establish a sharing platform that makes these experiences visible (anonymously) and offers the possibility to exchange projects, materials, ideas, and comments from their own country, but also worldwide. This platform will be available as a "D.I. Map" (Digital Inclusion Map - inspired by the "Queering the Map" project) on the DIGITclue project website.

## Thinking further

However, the development does not have to and should not end here. The users are encouraged to create their own projects and to adopt other perspectives, which can be chosen freely and vary according to the target group. The goal is a complete education and barrier-free coexistence in the context of (digital) inclusion.

With the (further) development of digital formats, a first step has been taken towards more effective inclusion in the analogue and digital spheres. To make this development visible, we invite you to share your experiences with others.

- ▶ Write a short summary of what it was like 20 years ago and where you think we are now.
- ▶ What else can happen to make the world (also digitally) more inclusive?
- ▶ Share your opinion on our D.I. map.

## 4.13 Digital Storytelling

Authors: Danijela Birt Katić, Jadranka Brkić-Vejmelka, Ines Cvitković Kalanjoš

Digital storytelling is combining the art of telling stories with a variety of digital multimedia such as images, audio, and video. Digital stories bring together a mixture of digital graphics, text, recorded audio narration, video, and music/sound to tell stories on a specific topic. The recommended duration is between 2 to 10 minutes; so digital stories are rather short.

### What is it about?

When presented in a simple and interesting way, digital stories can be useful when teaching, especially when discussing delicate topics, so that students can understand and/or identify with them. Digital storytelling is useful during formal and informal learning and teaching. Storytelling implies recognising the value of storytelling as a form of art. As there are certain steps to follow when telling a story (read in the Concept on Storytelling), try to follow them when you give instructions to your students.

### Try it out

#### Example 1

For students having problems with public speaking or performing in public, digital story telling can be a way for them to overcome these difficulties. Students can express their attitudes, problems, feelings, or knowledge in such a way because the story being told, using a digital tool (<https://bookcreator.com>, <https://www.canva.com/create/ebooks/>, <https://www.artsteps.com>), is speaking for them. For example, when discussing delicate topics such as any kind of violation, discrimination, racism, etc.

- ▶ Do you find that digital storytelling encourages and strengthens the individual presenting the information?
- ▶ How suitable do you find digital story telling when addressing delicate topics?
- ▶ What other aspects do you find important in digital storytelling?

#### Example 2

Students can create a digital story, with help from their teachers (in case the topic is rather challenging). Together they can explore and learn about the topic, and can extract the most important and interesting facts, conclusions, and attitudes. This work involves collaboration between students while teachers are coordinators. Topics could be homeland, patriotism, tolerance, acceptance, or sustainable development.

- ▶ What topics do you find challenging and suitable for this kind of work on digital storytelling?
- ▶ Can you tell the difference between digital and classical storytelling?

### Example 3

Students are formed into groups. Each group creates a digital story on the same topic. Each student has a certain role in their group: writer, director, storyteller, and screenwriter. Topics could vary: globalisation, multiculturalism, or pandemics, while the same story could be told in very different ways. In the process of making a digital story, different digital tools are used.

- ▶ Do you have possibilities to use such a way of telling a story?
- ▶ What technical problems might you face during the process of making a story?
- ▶ How do you find your students' abilities when creating digital materials?

### Tell your colleagues

You can share digital stories, using various digital tools, with your colleagues all over the world. The examples you create while working with your students can be shared with colleagues in your collective, but we would like to suggest that you share it via the Digital Inclusion Map on the Website of DIGITclue. The D.I. Map is a map of the world; you can enter your own projects, materials, ideas, and leave comments on digital literacy in your own country.

### Thinking further

While using digital storytelling, you will probably discover some delicate or challenging topics. Will it affect your personal view about topics you are teaching? Think about using different digital tools when creating digital stories and discuss with your students options/possibilities when using it while making a story. Put yourself in the position of storyteller and create your own story.

## 5 Annotated Literature

### 5.1 German

Angenent, H.; Heidkamp, B. & Kergel, D. (2019). *Digital Diversity. Bildung und Lernen im Kontext gesellschaftlicher Transformationen*. Wiesbaden: Springer Verlag.

The book discusses different aspects of social inclusion within the digital world. Different articles address topics around digital inclusion such as the digital gender gap, the digital divide, and the digital age gap. Some of the authors are discussing digital inclusion in the context of education (from school to university), but you can also find other aspects like health care, social work, or migration.

Ferencik-Lehmkuhl, D.; Huynh, I.; Laubmeister, C.; Lee, C.; Melzer, C.; Schwank, I.; Weck, H. & Ziemer, K. (2023). *Inklusion digital! Chancen und Herausforderungen inklusiver Bildung im Kontext von Digitalisierung*. Deutschland: Verlag Julius Klinkhardt.

Inclusion and digitalisation are about to decisively change society in several dimensions. This also includes (school) education. However, inclusive and digital educations, as central tasks of the education system, have so far been rarely discussed in combination. This book attempts to fill the gap and links digital inclusion together with digital education. The content is based on the online conference "Inclusion digital! - Opportunities and Challenges of Inclusive Education in the Context of Digitization".

Graf, D., Graulich, N., Lengnink, K., Martinez, H. & Schreiber, C. (2021). *Digitale Bildung für Lehramtsstudierende, TE@M - Teacher Education and Media*. Wiesbaden: Springer.

The book is aimed at the subject-oriented media didactic education of student teachers, teachers in preparatory service and teachers in schools. Numerous modules and concepts have been developed at the Justus-Liebig-University Gießen, which, from a didactic perspective, are intended to make basic skills acquirable for the target group specified above within the framework of digital education. In the contributions, the collected experiences and ideas are presented and made available for the development of similar models and concepts at other universities and study seminars.

Kaspar, K., Becker-Mrotzek, M., Hofhues, S., König, J. & Schmeinck, D. (2020). *Bildung, Schule, Digitalisierung*. Münster; New York: Waxmann.

This anthology brings together more than 70 articles on the subject of "education, school, digitization". A central goal is to depict and critically reflect on the current state of research on the various aspects, perspectives and questions of digitization in the context of school education and teacher training. Programmatic ideas on digitization and digitality, media concepts and application scenarios of digital media as well as questions of their effectiveness are discussed. Collected are empirical original works on the use of digital media, examples of good practice, descriptions of planned studies and theoretical contributions to the subject area.

## 5.2 English

Andreasson, K. (2015). *Digital Divide: The New Challenges and Opportunities of e-Inclusion*. New York: Routledge.

The book is divided into two main topics: digital inclusion and digital divide. The first part shows different challenges when dealing with the digital world, like the digital divide and the digital gender gap. Perspectives from various countries are shown, like China, Russia, Ghana, Europe, or Australia. The second part deals with the topic of digital inclusion and the opportunities the digital world gives. In this part are perspectives from Rio de Janeiro, India, Bangladesh, Sri Lanka, and Singapore.

Caruso, S. (2014). *Creating Digital Communities: A Resource to Digital Inclusion*. New York: Nova Publishers.

This book understands digital inclusion as the ability of individuals and groups to have access to and to use information and communication technologies (ICT). The author presents different ways of fostering digital inclusion in the U.S. A variety of projects and research are discussed in order to find a way to include everyone in the digital world.

European Commission (2022). *Compendium on digital inclusion in education: 8 country case studies and 33 inspiring practices*. Luxemburg: Publications Office of the European Union.

This handbook presents case studies from eight countries (Belgium, Bulgaria, Denmark, Estonia, France, and Italy). The findings come from a study conducted between September 2020 and August 2021. The title was “Enhancing learning through digital tools and practices: How digital technology in compulsory education can help promote inclusion”. The aim was to show how digital technologies could help with digital inclusion in the educational sector. This handbook is a summary of the different aspects that are important for this across Europe.

Köhler, T., Lucke, U. & Zhang, X. (2021). *Educational media technology and its inclusive potential. A multidisciplinary review of recent approaches in informal, formal and continuous education*; In: Schumacher, C. (Eds.): *Proceedings of the DELFI Workshops 2020*, Heidelberg, Germany.

The paper investigates the inclusive potential of educational media technology, based upon a review of recent approaches in informal, formal and continuous education. It is intended to present approaches at the interface between technology enhanced learning and teaching and the ongoing development of computer sciences and respective technological approaches. Indeed, respective papers reflect special needs of learners in any sector of education from informal to formal learning and as well-situated education in the context of the home or workplace. Most recently, the corona pandemic did lead to a strong need for including even average population without any special need into formal education. Reflecting that development, the focus of the workshop shall be on both, special needs and special conditions addressing requirements of TEL / TET. Accordingly, special attention is given to international, even global comparative approaches of how educational media technology is applied in an inclusive way covering both, an individual psycho-physiological as well as a socio-cultural dimension. Subsequently it can be concluded that authors have been able to identify diverse perspectives of inclusiveness when it comes to the adoption of educational media technology.

Ragnedda, M. & Mutsvairo, B. (2018). *Digital Inclusion: An International Comparative Analysis*. Lanham/Boulder/New York/ London: Lexington Books.

This volume examines the challenges and possibilities of a digital society characterized by the increasing importance of information and communication technologies (ICTs). Based on this, it is necessary to think about ways to avoid all forms of digital exclusion or digital discrimination. The book comprises different articles from a variety of countries and sciences. The authors analyse the various meanings of digital inclusion in different countries all over the world.

### 5.3 Croatian

Vican, Dijana; Karamatić Brčić Matilda. 2013. Obrazovna inkluzija u kontekstu svjetskih i nacionalnih obrazovnih politika – s osvrtom na hrvatsku obrazovnu stvarnost. *Život i škola*, 30/2: 48-66.

The paper discusses the origin of inclusion in education and the effects it can bring in the context of international education policies throughout European countries, specifically in regards to education in Croatia. The authors discuss the differences and the relationship between the wider meaning of educational inclusion and integration of children and students with special needs. The paper talks about the problems with implementing inclusion from the perspective of teaching practices as well as the changes that occur within school culture.

## 6 Further Sources

<https://www.inclusion-digital.ch/>

The website is from a project called “Digital participation of people with disabilities in vocational training” from Switzerland. An interdisciplinary team conducts research concerning chances and challenges for people with disabilities. The website is available in German, French and Italian.

<https://www.art2wear.at/>

This website deals with the digital transformation of art. You can get some information on digital art and the transformation process, as well as specific projects the artist created. There are also suggestions and materials provided on how to use digital art with pupils in the classroom.

<https://imoox.at/mooc/?lang=en>

Imoox is an Austrian platform, which offers free courses to different topics like psychology, digital competencies, democracy and participation. They also provide courses about digital inclusion,

which contain videos about for example about robot-ethics, digitalisation in the healthcare, algorithmic bias, books and digitalisation.

<https://leaschulz.com/diklusion/>

The website contains information about the concept of “Diclusion” which tries to connect Inclusion and Digitalisation. You can find here materials on Diclusion to use in the classroom, but also dates for workshops and lectures. The website provides a mixture of different methods and includes videos, further links and Podcasts.

<https://transca.net/en/index>

TRANSCA (Translating Socio-Cultural Anthropology into Education) was an Erasmus+ project coordinated in Austria at the University of Vienna, but also Greece, Denmark and Croatia participated in the project. The main resource on this page are different concepts from socio-cultural anthropology, which are prepared for teachers to use them in their classrooms.

## 7 Glossary

**Cyberethics** can be described as the study of ethics relating to everything connected to the digital, as well as the impact on individuals and society. The use of the Internet has increased through the last decades. Because of this, rules, moral norms, or values are needed when participating in the digital world.

**Digital Age Gap** is the third sub-form of the Digital Divide. It refers to the differences between the older and younger generations in using the Internet. People 65+ often do not have the skills to use digital technologies. There are attempts to help the elderly, improving their digital skills, and in this way closing the digital age gap.

**Digital Cultures** is a concept that describes how the digital world is influencing and shaping individuals as well as groups. The digital world has an impact on how people are thinking, behaving, and communicating.

**Digital Divide** refers to the inequality in having access to and using the digital world. The gap can be seen between individuals, social groups, and even between countries, and can have different reasons. Not all people are living without new technologies due to inequalities. Some people voluntarily do not use digital technology.

**Digital Gender Gap** is a sub-form of the Digital Divide. It refers to the differences between men and women regarding the use and access to new technologies. Because of the Covid-19 pandemic, the gap has increased.

**Digital Inclusion** refers to and the possibility of using everything related to the digital world regardless of one's, gender, ethnicity, language, "race", mental, sensory, or physical challenges, family, religion, worldview, cultural belonging, age, or social class.

**Digital Literacy** refers to the skills people need to use the digital technologies in a useful and safe way. It is not only about how to use digital technologies, but also how to evaluate different information on the Internet, as well as estimating the security when trying out new websites on the Internet.

**Digital Queer Gap** The Digital Queer Gap is the second sub-form of the Digital Divide. It refers not only to unequal access about men and women, but extends the issue to the whole LGBTIQ+ community. It not only describes the differences in the use of new technologies but also refers to the inequalities and the injustice faced by members of the LGBTIQ+ community on the Internet.

**Digital Storytelling** describes the combination of storytelling with digital media, such as audio, video, or images. The great advantage in telling a story with the help of the digital is the possibility of sharing it with people easily and the opportunity to work on it together with other persons all around the world. With this approach, different points of view can be added to the (digital) story.

**Digital Transformation** is a term that describes the use of new digital formats in different aspects of life. Especially in the context of education, there are some new possibilities in teaching and learning, where sometimes teachers do not have to be present all the time. Some examples are Massive Open Online Courses (MOOC) or Open Educational Resources (OER).

**Digital Worldmaking** is a term referring to the shaping or making of the world through the digital. Often there are intersections with the non-digital world, which means that the online and offline world cannot be strictly divided.

**Digitalisation** refers to the transformation process from different aspects of our life by the digital world. One example would be education, where different Apps and Websites could be used during the lessons to broaden the knowledge of the learners.

**Inclusion** can be defined as the participation in society regardless of an attributed or official status. Part of it is also the potential of achieving equal results while not having the same level of education.