

## Opening Schools to Students' Informal Digital Knowledge to Enable the Emancipatory Employment of Digital Media

Heinz, Jana

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**OPENING SCHOOLS TO STUDENTS' INFORMAL  
DIGITAL KNOWLEDGE TO ENABLE THE  
EMANCIPATORY EMPLOYMENT OF DIGITAL MEDIA**

**Heinz, Jana**  
German Youth Institute  
Munich, Germany  
[heinz@dji.de](mailto:heinz@dji.de)

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## **ABSTRACT**

While classes become more heterogeneous and children grow up as digital natives, instruction is still characterized by an emphasis on middle-class children and analogue media. Moreover, national and international comparative studies have repeatedly shown that Germany in OECD comparisons often ranks last in terms of the level of digital learning opportunities in schools. A gap exists between children's lifeworld experiences and informal learning processes in a digital world on the one hand and digital learning opportunities at school on the other. Thus, schools do not offer content and digital infrastructure that links to students' informal digital knowledge. Therefore, there is a need to discuss how schools can integrate the emancipatory power of digitalization.

## **1 THE DIGITAL DIVIDE**

Well-known problems of educational institutions remain in a digital world. Students from low socio-economic backgrounds tend to not benefit from educational opportunities at school as much as students from higher backgrounds (Bourdieu & Passeron, 1977). These problems have been well documented in sociology since the expansion of education in the 1960s and have also been discussed widely by the general public since the first PISA publications. These injustices seem to have been further intensified by digitalisation (Ma, 2021). Thus, a digital divide has become apparent (Robinson et al., 2015)—again to the disadvantage of children and young people from low socio-economic backgrounds. Although they are familiar with the use of digital media, they still have low digital skills (Ghobadi & Ghobadi, 2013). Studies show that this is not so much due to digital family equipment (first-level divide). Rather, inequality is reinforced by differences in media use (second- and third-level divide) (Scheerder et al., 2017) and, above all, by differences between their informal digital knowledge and school requirements (Heinz, 2016).

While children from socially weaker milieus seem to use digital media in their free time more often than children from higher social milieus, this is not automatically accompanied by a learning advantage. The acquisition of digital competences depends not only on the frequency of use, but also on skills such as reading skills and dealing with complex information. In addition, digital learning opportunities are often quite challenging. For example, they require children to learn independently, yet, children with learning difficulties sometimes need additional support. At the same time, it is evident that children from socially weaker backgrounds are familiar with digital media and thus highly motivated to work with it in schools.

However, while classes become more heterogeneous and children grow up as digital natives, instruction is still characterized by an emphasis on middle-class children and analogue media. Moreover, national and international comparative studies have repeatedly shown that Germany as a whole often ranks last in terms of the level of digital learning opportunities in schools. Thus, schools do not offer learning and teaching that links to students' informal digital knowledge. Therefore, there is a need to clarify how schools can integrate the emancipatory power of digitalization.

## **2 ANALOGUE SCHOOLS (LARGELY) IN A DIGITAL WORLD**

A look at practice and research in education reveals that digital media in schools is seen more as a tool for optimizing learning processes, and rarely as part of a changed, digital world (Krommer et al., 2019). Only in a few schools can pedagogical concepts and school routines be identified that exploit the potential of digital media for active and creative use in education: “When digital media are used

in lessons in German schools today, they are generally used for presentations, research on the internet or worldwide web, or reading in PDFs. Two aspects in particular stand out: Firstly, teaching with digital media appears to be primarily receptive and not very active. Secondly, it is apparent [...] that in very few schools teaching goes beyond the implementation stage of substitution, i.e. the replacement of analogue media with their digital equivalent.” (Knaus, 2017, p. 58, author tr.). Uta Hauck-Thum and Noller (2021) argue even under the conditions of digitalization and digitality, teaching and learning processes are primarily oriented towards the print-media book culture. If digital media is employed at all in schools, then as tools to replace analogue media but they neither influence teaching structures nor encourage children to participate.

Obviously, a gap exists between children’s lifeworld experiences and informal learning processes in a digital world on the one hand and digital learning opportunities at school on the other. Today, children and young people grow up in a world with digital media as a matter of course and are therefore regarded as “digital natives.” However, this picture does not stand up to closer analysis when looking at the digital competences of children and young people: These competences are low level and mainly comprise user knowledge, i.e. simple surfing the internet, researching terms or clicking/opening apps (Aesaert et al., 2013). Without didactic and pedagogical support, students apply this knowledge superficially. Neither transferable action knowledge for the confident use of application software nor an understanding of the safe handling of data is built up by students on their own (Litt, 2013).

However, the term digital natives does make sense when one looks at the extent to which children are now growing up with digital media, as shown by the study “DIVSI U9 Study - Children in the Digital World” (DIVSIO, 2015, p. 6), which examined the media use of children aged 3 to 8. The authors conclude that it is no longer a question of whether children of this age should already use digital media. Rather, children have long been moving autonomously in a digital world and have a great interest in digital media. “Around 1.2 million 3- to 8-year-olds are regularly online. Children who cannot yet read and write recognize corresponding symbols that enable them to call up web offers.” The KIM study, which examines the media use of 6- to 13-year-olds in Germany, draws similar conclusions. It reports, “42 percent of girls and boys use a mobile phone or smartphone every day, and at 35 percent, one in three listens to music almost daily. A good quarter of the children use the internet daily.” (Feierabend et al., 2017, p. 10, author’s translation). Digital media is thus an integral part of the lifeworld of children and adolescents and thus a significant influencing factor in their primary socialization. Children learn to use digital media as a cultural technique—such as reading and writing later on—in often informal learning processes in everyday life.

If children already bring digital user knowledge with them to school, the question of whether children can or should already learn with digital media in schools is outdated. Rather, it is now a question of how school-based learning can be connected with children's various digital competences and strengthens them in the confident use of digital media. Moreover, knowing about the digital divide alone is an argument for the expansion of school curricula to include digital competences. Only in this way can schools fulfil their educational mandate to prepare pupils from *all* social backgrounds for future living and working environments, which will be shaped even more in the future by digital technologies.

### **3 SCHOOL STRUCTURES IMPEDING DIGITAL EDUCATION**

Three main factors explain the gaps between students' informal digital knowledge and schools' focus on analogue teaching. These include, firstly, the typical discourses on digital forms of teaching and learning in schools in Germany, which are often limited to the vulnerability of young children in particular and thus overlook its potential. Moreover, the unclear and sometimes contradictory data on the effects of digital media on learning processes plays a particularly important role in understanding the hesitancy to open up forms of teaching and learning to digital changes. Secondly, binding guidelines for the implementation of school development concepts with a focus on digital teaching and learning have only been recently introduced. Thirdly, typical school functional logics have hindered the integration of social changes and thus of digitalization into school structures. These factors will be analyzed below.

#### **3.1 DISCOURSES ABOUT DIGITALIZATION**

A look at the social sciences reveals major differences between the definitions of digitalization in different disciplines. In media cultural studies and sociology, for example, the newly emerging communication technologies have been studied with regard to their social effects since the 1950s. Amitai Etzioni (1968), for example, asks how people can use them to authentically and actively shape their own society and where the dangers of being dominated by them lurk. Similarly, in his 1986 book *The Postmodern Condition*, Lyotard ([1982] 2002) explores how knowledge becomes integrated into social structures when it is no longer legitimized by metanarratives (such as beliefs in progress). In particular, under the conditions that all people are guaranteed access to knowledge, via online databases, he describes opportunities for a new scope for plurality of knowledge. As a prominent representative of media studies, McLuhan ([1964] 2008) in turn shows how technologies and electronic media change perception and culture globally. What these concepts have in common is that

digitalization is not limited to technical concerns. They instead show how individual preferences, technical and cultural processes influence each other.

Current theories in this tradition, such as Felix Stalder's "The cultural condition" (2017) or the concept of "post-digitality", initially emphasize the self-evidence of digital worlds. "Being digital will be as normal as breathing air and drinking water. Only once digital devices don't work will we remember them." This is how Nicholas Negroponte (1998) describes the ease with which we (will) have become accustomed to the digital infrastructure of our lives. Kim Cascone (2000) refers to this now invisible self-evidence of the former "digital revolution" in the economy, culture, and life of every individual in his use of the term post-digital, which has since found its way into recent works on digitalization or digitality. As in the first concepts (Etzioni, Lyotard, McLuhan) two contrasting digital futures are usually sketched (cf. e.g. Stalder 2017), one as utopian (freely accessible knowledge, technology and technologies of participation) and the other as dystopian (post-democratic world of surveillance and capitalist knowledge monopolies).

Digitalisation as a topic for education, again has a specific framing. In terms of time, three different phases can be distinguished, even if they overlap and are rather heuristic in nature: Initially, the critics of digital media dominated public perception—especially in the feature pages of major magazines (Büsching & Riedel, 2017). The scenario of digital dementia conjured up, for example, by Manfred Spitzer—brain researcher and critic of digital games and learning opportunities—is paradigmatic of this, arguing it threatens young people if parents do not protect them from digital media. These warnings still seem to dominate the attitudes of many parents, especially in the middle classes with their strong emphasis on education.

The subsequent phase focuses primarily on the "added value" ("Mehrwert") of using digital media in classroom teaching and learning settings and emphasizes the "primacy of the pedagogical" (cf. critically Krommer, 2021). Additionally, scientific studies on the learning effects of digital media referred to in this context were highly contradictory, as shown, for example, by the results of the meta-study published in 2009 by the learning researcher John Hattie. In a systematic review of more than 800 studies on factors that positively influence learning outcomes, Hattie also examined computer-based teaching. According to Hattie, most of these forms of learning, such as internet exercises or simulated games, had little to no effect. Only interactive learning videos achieved a measurable positive learning effect (Hattie, 2009). In contrast, there are studies that focus on the effects of the targeted use of digital learning opportunities to assist children from socially disadvantaged backgrounds (Ma, 2021). Schachter and Booil (2016), for example, show how preschool teachers were able to significantly improve the mathematics skills of children with learning

difficulties from socially disadvantaged families in a short period of time through the use of special software learning programs.

Finally (as the third phase), the perception that digitalization is also fundamentally changing education itself, in the sense of a comprehensive cultural change (KMK 2021), is gaining ground. For example, in 2021, the Conference of German State Education Ministers (*Kultusministerkonferenz*, or KMK for short) published a supplement to the strategy “Education in a Digital World” from 2016, documenting this change. The newly published supplement “puts into perspective the path from ‘teaching and learning with digital media and tools’ to learning and teaching in a constantly changing digital reality, which becomes evident as a digital culture, particularly in cultural, social and professional modes of action, and in turn triggers the digitalization processes.” (KMK, 2021, p. 3, author’s translation)

These changes affect education, educational institutions and access to knowledge. Thus, the plurality of knowledge institutions is emerging, which include digital knowledge databases such as Wikipedia. Via digital devices, knowledge is decentralized and accessible to all: “The classrooms and lecture halls of yesteryear are dead, although you still find them everywhere and although society [...] still wants to impose them on us” writes Michel Serres (2015, p.38) to illustrate the extent of cultural-technological changes for each individual as well as educational institutions.

### **3.2 NO LONG-TERM FOCUS ON DIGITALIZATION IN SCHOOLS**

State infrastructure was lacking for a long time. Only since 2016 have the German Government and the federal states made extensive financial resources available to create digital infrastructures (see, e.g., DigitalPakt Schule of the Federal Ministry of Education and Research). The disbursement of these funds is linked to the condition that the schools applying for this funding prepare school development plans focusing on digitalization. These plans must include descriptions of the planned integration of digital teaching and learning settings, what pedagogical concepts will be employed and how teachers will be trained. Furthermore, the teaching of digital competences has been anchored in the curricula, educational plans and framework curricula of the federal states since 2016. Accordingly, digital competences should be taught beginning in primary schools and continue, not as an additional subject, but as an integral part of all subjects (KMK, 2016).

With these federal and state digital packages and the inclusion of digital competences in the curricula, the educational policy framework for the comprehensive digitalization of schools has been set. Some principals had already tackled the digitization of their schools, but typically on their own and often with time-limited and project-based initiatives. Likewise, individual teachers have been using digital teaching and learning tools in their classes for a long time and have shared their



experiences on social networks. Well-known online-sites include Lehrer-Online (<https://www.lehrer-online.de/>) as well as Edupunks and Twitterlehrerzimmer (formerly EdchatDE) on Twitter (#twlz #twitterlehrerzimmer).

Since comprehensive infrastructures were lacking for a long time, the existence of digital teaching and learning concepts in schools depended on the commitment of individual school principals. Accordingly, schools still differ with regard to their degree of digitalization. This heterogeneity was evident during the conversion to distance and hybrid teaching in response to the COVID-19 pandemic. Not surprisingly, those schools that had already integrated digital forms of teaching and learning before the restrictions came into effect in March 2020 had a distinct advantage (OECD, 2021). Here, students could be better served with learning opportunities, teachers felt less burdened by the change to distance or hybrid teaching and reported that they were able to prevent the exacerbation of educational inequalities related to the socio-economic background of the students. In contrast, most teachers and learners in those schools, which had no digitalization strategy—especially in primary schools—, were overwhelmed by the abrupt switch to distance and hybrid teaching. Here, compared to regular school attendance, (digital) instruction was reduced and focused predominantly on the core subjects. Accordingly, many parents wished for more intensive contact and more advice on how to support their children. The lack of technology did not seem to be the main reason for limited teaching. Almost all households in Germany had internet-enabled devices (Porsch & Porsch, 2020).

### **3.3 SCHOOL LOGICS**

Thirdly, schools are defined by a specific organizational logic that shapes their ability to integrate digitalization. Helmut Fend describes challenges that school actors face when they seek to integrate societal changes into schools. He speaks of a *re-contextualization* that becomes necessary (Fend, 2006). Similar challenges have also become evident with regard to digitalization. School leaders are required to integrate digital learning environments into their schools, yet they have to link these to specific conditions for action, such as the school infrastructure, the expectations of the teachers and the parents as well as the needs of individual children. This is particularly difficult when schools are overburdened by reform projects (inclusion, all-day schooling, increasing heterogeneity of pupils) taking place at the same time, the innovations are highly complex (maintenance, disposal of digital devices, uncertainties regarding applicable data protection regulations) and cannot fully be linked to internal school norms and established practices. In particular, teachers must be convinced of the innovations' benefits and be able to work with them; accordingly, training in initial and further education is necessary if digitalization is to be a permanent feature of teaching practice (Heinz, 2018).

#### **4 CONCLUSION: KEEPING THE FOCUS ON THE EMANCIPATORY POTENTIAL OF DIGITAL MEDIA**

Digital media are an integral part of children's and young people's lives and thus a relevant influence on their primary socialization at home. Moreover, with the onset of primary school, media ownership and consumption grow rapidly with each passing year. Accordingly, children grow into an independent use of the digital world, often before they learn to employ it more systematically. Children acquire the use of digital media as a cultural technique—like reading and writing later on—often in informal learning processes in everyday life.

However, in particular with regard to schools, digitalization is not limited to a plug-in-and-play /learn of digital devices but requires the integration of socio-technical interdependencies that range from digital devices to children's hybrid prior knowledge, virtual worlds, data protection, and the economic interests of a digital capitalism. This places a variety of demands on schools. In addition, digitalization as a social change is accompanied by changes in the world of work and life, and new educational tasks arise in order to prepare children for sovereign participation in a thoroughly digitized world (such as the “new” competences of creativity, communication, collaboration, critical thinking, OECD, 2020). Thus, digitalization increases the number of objectives, such as imparting knowledge to children with different learning backgrounds, balancing out educational inequalities and, at the same time, allocating them to different educational paths.

Individual teachers and school principals alone cannot meet this multitude of demands. It requires their cooperation. Further, on the part of educational policy and administration, binding specifications in the form of reliable infrastructures (curricula, training, and further education etc.) as well as technical assistance in the procurement and maintenance of digital networks and devices is needed.

In view of these challenges, it is important to keep the focus on the emancipatory potential of digital media, which includes students' access to knowledge, the diverse previous experience of children with digital media and their creative use of it. However, this emancipatory power can only be unleashed if children are taught the competences to achieve digital sovereignty through schools.

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