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EDITORIAL

Education in the Digital World

Challenges and Pitfalls in the 2020s

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ABSTRACT

This editorial places the topic of the Special Issue, "Education in the Digital World," in a wider national and international context: At a national level, the "Standing Conference of the Ministers of Education and Cultural Affairs" ("Kultusministerkonferenz") initiated a national strategy in 2016 aiming to enable learners to lead a self-determined life in the digital condition (Stalder, 2016). In this context, both new technologies and didactic scenarios for the various teaching contexts are to be developed and tested. The Special Issue, with its interdisciplinary and multi-perspective contributions, aims to further this goal. The conference called for educational processes in the digital world that are based on innovative technologies, adequate didactic scenarios, and well-trained teachers to not only implement a nationwide strategy, but also to solve global issues. Indeed, it seems plausible that solutions in digital education can be a key part of the human response to technological innovation in juxtaposition with international crises and conflicts. Finally, future challenges, opportunities, and contributions of "Education in the Digital World" are identified and presented.

Education in the Digital World

Wherever human beings come together, their interactions can have learning outcomes—whether deliberately or accidentally. This naturally also occurs within digital spaces that allow human interaction. Newly-emerging forms of communication require new adjustments not only in the way we plan and realize education, but also in terms of how we value and conceptualize it. The present Special Issue is located within the German strategy initiated by the "Standing Conference of the Ministers of Education and Cultural Affairs" ("Kultusministerkonferenz," hereafter, KMK) in the 2010s, whose implementation is still ongoing: In 2017, the KMK published a framework paper on its strategy, titled "Education in the Digital World," based on a resolution passed in December 2016 (KMK, 2017). The framework paper can be seen as the starting point for a nationwide process involving numerous stakeholders and institutions that addresses one of the greatest challenges of the 21st century: Organizing education in such a way that it enables learners to lead a self-determined life in a digital world.

The framework paper on the KMK's strategy establishes the fields of action, tasks, and conditions for the success of "Education in the Digital World" for two areas: school/vocational education and higher education. Despite the differences in these two areas in terms of stakeholders, educational mandates, and legal frameworks, there are also intersections. For instance, higher education institutions generally train future teachers for schools and vocational education (see Gittinger & Mulders, 2024 in this Special Issue).

In the 2016/2017 framework paper (KMK, 2017), digitalization in education is initially understood as a process in which working with digital tools and media in educational processes is increasingly replacing analogue procedures and methods. On the one hand, this works in tandem with ample opportunities, such as data-informed personalization and adaptation of learning (Chounta et al., 2022), the constructive design of the virtual world as an opportunity of educational processes (Wiesche et al., 2023), or the analysis of digital platforms in teaching-learning contexts in order to reflect on digital communication (Gredel, 2023). On the other hand, it also harbors risks that raise new questions, such as concerns over privacy (Oeldorf-Hirsch & Neubaum, 2023). The KMK paper formulates two goals for the educational context of schools: a) The federal states should include the skills required for active, self-determined participation in a digital world in their curricula and education plans; b) Digital learning environments should be systematically used in the design of school teaching and learning in accordance with curricular requirements. The framework paper also formulates goals for universities: Digitalization should serve the fulfillment of core university tasks in teaching and research, but not be an end in and of itself. The aim of the strategy is then to define requirements and needs for action in the performance of academic tasks in order to

determine the opportunities afforded by digitalization and identify future development pathways.

With the additional experience of the COVID-19 pandemic, the KMK presented supplementary recommendations in 2021 under the title “Teaching and learning in the digital world” (KMK, 2021). These recommendations relate to the surge in digitalization caused by the COVID-19 pandemic and the associated measures to reorganize schools and teaching. The diverse impulses that have arisen from teaching during the pandemic are to be used in the long term through various innovative concepts. In this second paper, the focus of the KMK strategy has also shifted from the use of digital tools and media to living and learning in the digital condition, as described by Stalder (2016): Digitalization and mediatization have led to decisive changes in all areas of our personal and professional lives. These transcend purely technical progress and lead to a broad-based cultural and social change that impacts school teaching and learning, and how children, adolescents, and young adults manage and organize their life and work. Part of this current process and redesign with numerous stakeholders, infrastructures, and resources are also reflections on whether educational processes should be oriented to a post-democratic world of surveillance, proprietary resources, and knowledge monopolies, or in a culture or equality and participation (Holmes et al., 2022).

Following the publication of the two framework papers, the learning standards (“Bildungsstandards,” hereafter, BiStas) for each subject are being gradually amended to integrate aspects of the two papers. For example, the learning standards for the subject of German (BiStas, 2022) specifically refer to the use of online resources for German lessons. As the educational standards formulate competences in relatively abstract terms, this raises questions for many educators as to where and which resources are (freely) accessible and how they can be used. For example, requirements for the publication of open educational resources are important pillars of “Education in the Digital World” (see Atenas et al. 2024, in this Special Issue).

The KMK describes the strategy’s implementation as a complex task in which numerous stakeholders in society, and thus, also scientists from a wide range of disciplines, are to participate. In this context, both new technologies and didactic scenarios for the various teaching contexts are to be developed and tested, with the aid of the Special Issue. Digital educational processes can not only be used to implement a nationwide strategy, but also to solve global issues. Indeed, their cutting-edge solutions in the field of digital education can play a key role in the response to technological innovation in the face of international crises and conflicts.

Education in the Digital World in Times of Crises and Conflicts

The COVID-19 pandemic disrupted education, affecting 1.6 billion learners worldwide. Vulnerable learners, such as those in the Global South (UNESCO, 2022), were particularly affected by the pandemic. Despite the efforts of many governments and educational institutions to quickly implement Emergency Remote Teaching, the lack of connectivity and equipment prevented at least a third of learners from pursuing distance learning. In this context, significant digital gender gaps persist in many regions of the world, particularly limiting the capacity of girls and women to keep up with online distance learning (UNESCO, 2021). Beyond impacts on health and well-being, the pandemic led to learning losses and upended the educational trajectories of an entire generation. Against this background, crisis recovery is crucial, as is the transformation of educational systems by developing projects, initiatives, and multi-stakeholder networks and projects that re-envision and redefine the "baseline" of digital education. Two contributions in this volume include experiences, concepts, and data from education in the context of the pandemic (see Knaus, 2024, and Chavoshi et al. 2024, in this Special Issue).

Further to the COVID-19 pandemic, the armed conflicts of recent years must also be taken into account in the context of digital education. Indeed, "In 2022, approximately 468 million children (18.8%, or more than 1 out of 6) were living in a conflict zone. This constitutes a 2.8% increase from 2021, when 455 million children lived in a conflict zone" (Peace Research Institute Oslo/Save the Children International, 2023). The recent war in Ukraine has once again provided sad evidence of this fact. Unfortunately, many of these children have to experience very limited or no access to education, despite education having been enshrined as a basic human right (WarChild, 2024). Technology can serve as a provider or facilitator of the right to education. Human beings can use technology to access educational resources that would be otherwise unavailable, fulfill information needs, and create unprecedented learning environments for collaborative education.

At the same time, this very same technology can hinder education through its potential to become a viral mediator of misinformation, distorted narratives, and manipulated content. Large-scale crises and conflicts around the world mostly relate to diverging interests among various parties, which are also reflected in streams of diverging information in digital media. In times of conflict, it is pivotal to not only ensure that every human being has access to education and can continue to learn, but that the information that forms the basis for education is impartial, balanced, and accurate, as well as that individuals have the skills to evaluate said information properly. According to a representative survey in Germany, believing in conspiracy theories concerning the Russian invasion on Ukraine is positively related to an increased use of

social media (especially Telegram, see Lamberty et al., 2022). We thus need to ask how we can equip individuals with the abilities to identify, as well as internally and externally counterargue, partial, unbalanced, and inaccurate information. Consequently, we are in dire need of frameworks and scenarios aimed at empowering individuals with the essential competencies needed to thrive in digital societies (see Huschle et al., 2024, in this Special Issue).

Education in the Digital World in Times of Technological Innovation

The release of the ChatGPT text generator in November 2022 brought the topic of artificial intelligence (AI) into the public eye. ChatGPT's impressive performance in generating texts has quickly led to high usage figures both in general and among students. Indeed, according to the latest JIM study (MPFS, 2023, p. 31), 38% of the students surveyed had already tried the tool only months after its release, with the figure rising to 51% among 16 to 17 year-olds. While learners have predominantly come into contact with AI passively, for instance, in the context of automatic speech recognition, they have now become active users of large language models in a very short space of time. This is certainly one of the reasons why education policy stakeholders are discussing the opportunities and risks of AI-based tools within schools and universities in handouts, position papers, and relevant blogs (Gredel et al., in press).

There are also discussions about how AI will change educational processes and examination cultures (see Brommer et al., 2024, in this Special Issue). The resulting opportunities and dangers are the subject of many controversies. The challenges here go far beyond the concerns of technology-focused approaches. Technical innovations and the extended availability of such tools as ChatGPT require a professional and didactic approach to these technologies. Cultural, psychological and social aspects, for example, must also be considered from multiple perspectives. This Special Issue takes this desideratum into account.

The Special Issue

This Special Issue takes a multi-perspective approach to the topic of digital education and combines the interdisciplinary contributions that each address important challenges in the field. In abstract terms, the following challenges must be mastered in the broader context of digital education:

\ Digital education can help ensure that learners have access to resources, infrastructure, and know-how, even in the context of such crises as pandemics and (armed) conflicts. It is important to reflect comprehensively on experiences from past crises in order to develop sustainable, cutting-edge solutions.

- In order to enable broad access to digital education, it is crucial to question when and how post-democratic tendencies (Stalder, 2016) can be supplemented or even replaced by the provision of freely- and equally-accessible resources.
- Despite all the enthusiasm for technical innovation and progress, the legal framework and ethical concerns of digital education must be taken into account.
- When implementing digital education, teachers must be supported in acquiring important skills and literacies on technical innovations as comprehensively as possible. Adequate scenarios and integrative frameworks can support (future) teachers and subsequently also learners in equipping themselves for a self-determined life in the culture of digitality.
- Purely technology-oriented approaches fall short when it comes to digital education. New technical innovations, which can also be used for teaching and learning processes, must be carefully evaluated in terms of their effects on cultural and social processes.

The collection of articles published in this Special Issue covers the breadth and diversity of problems and settings that emerge when educational processes occur in a digitized world. For example, Professor Lucke's "The Voices" critically views the National Education Platform, which has attracted significant attention in the German education landscape since 2021. It discusses both positive expectations for the ambitious initiative and criticism of individual aspects. It addresses the questions of which target images of a digital ecosystem for education are recognizable and which decisions are necessary to define a tangible and implementable vision. Knaus's qualitative-reconstructive meta-study reflects on 65 multidisciplinary papers written during the pandemic which empirically examine the challenges, achievements, and failures of the first large-scale experiment in university teaching during that time. Atenas et al. explore the importance of Open Educational Resources (OER) in higher education, focusing on their development, understanding, and opportunities. Chavoshi et al. investigate how the factors influencing the adoption of Massive Open Online Courses (MOOCs) have evolved in response to the increased usage of online courses during the pandemic. Huschle et al. examine the conceptualization of citizenship within the field of Digital Citizenship Education (DCE) to develop, as a second step, the Integrated Framework of Abilities for Digital Citizenship. Gittinger and Mulders focus on Augmented Reality (AR) in educational contexts containing a theoretical framework for using AR for teaching, a hands-on conceptualization, and a joint exploration of the finished solutions. Brommer et al. discuss the extent to which text-generating AI can support the development of (human) genre competence, as well as the tool's suitability for writing didactics.

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