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Conceptions of education and ethics of AI in higher education: An exploratory qualitative study

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Abstract

The digital transformation of society significantly impacts higher education, leading to notable changes in teaching, learning and the management of higher education institutions. These developments raise new (ethical) questions, such as whether AI-based technologies in higher education affect and change prevalent conceptions of education and whether such changes are ethically relevant. This study begins with the premise that AI-based technologies are not neutral regarding normative assumptions about what education is and should be (i.e., conceptions of education). It then demonstrates why the impact of AI-based technologies on conceptions of education should be considered when ethically assessing those technologies in higher education. The exploratory qualitative study, comprising semi-structured guided interviews and a focus group with representatives from the higher education sector, aims to provide new insights by identifying whether experts see a link between the conceptions of education and the ethical evaluation of AI-based technologies. The study seeks to clarify which conceptions of education are prevalent, how AI-based technologies are perceived in higher education institutions and their relevance, what current developments are observed, and what they imply for the mission of higher education institutions. The study shows that ethical issues are significant in reflecting on conceptions of education and the self-understanding of higher education institutions, especially in the context of the use of AI-based technologies. It is shown that the reflection on the goals and aims of education (conceptions of education) and higher education institutions (mission statements) is crucial for ethically evaluating the use and implementation of AI in higher education.

Keywords

Artificial intelligence; AI in higher education (AIHEd); AI Ethics; learning analytics; educational theory

1 Introduction

The COVID-19 pandemic has shown that the use of digital tools and AI-based technologies in higher education institutions will be vital for making them fit for the future. Moreover, recent developments in the field of generative AI-based technologies, such as ChatGPT-4, have underlined the fact that those technologies pose new challenges to the educational system regarding teaching and learning practices (Farrokhnia et al., 2024).

Overall, the discussion on the transformation of education through the development and implementation of AI-based technologies has noticeably intensified. Discussions revolve around questions of assessment formats, instructional design, data security and legal regulation as well as ethical issues. Although ethical issues related to AI and education remain pressing (Bond et al., 2024, p. 33) and are increasingly being taken into account, they tend to focus on questions of privacy, transparency, fairness, non-discrimination, data security and personal autonomy (Bond et al., 2024; Guan et al., 2023; Tzimas & Demetriadis, 2021; Yu & Yu, 2023).

While these are important issues, the ethically responsible use and implementation of AI-based technologies in higher education does not merely depend on their compliance with the abovementioned ethical principles. Ethical questions surrounding the use of AI-based technologies in higher education (AIHEd) institutions are more complex than commonly addressed. The current study focuses on this complexity, which is rarely addressed under the heading of "ethics." The core argument of this article is that ethical issues in the context of AIHEd must be addressed in relation to the (philosophical) *conception* of higher education (*Bildungsbegriff*). This means that they depend on the answers to the question of the educational goals and purposes of higher education institutions.

AI-based technologies are not neutral regarding the normative premises about what education is and should be. This thesis, elaborated below primarily from an educational theory perspective, builds on the widely established view in philosophy of technology and science and technology studies that technologies are never neutral, but always carry normative force, regardless of users' intentions (cf. Coeckelbergh, 2024). AI-based technologies transport specific (normative) conceptions of education and can shape and change them. The transformation of conceptions of education should also be considered in ethical discussions on the use of AI-based technologies in higher education.

The findings presented in this article are the outcome of the research project BiKIEthics, conducted at the University of Vienna between April and December 2022. The research project aimed to emphasize the importance of addressing the entire range of ethical questions related to AI-based technologies in higher education, including existing and mediated normative conceptions of education. In the first step, the project determined what exactly (normatively) qualifies our conceptions of education. Subsequently, a selection of AI-based technologies was then analysed within this theoretical framework. In the second step, an exploratory qualitative study was conducted. The results of this qualitative study form the basis of this article.

The key questions guiding our research are:

1. To what extent do experts perceive a link between conceptions of education and the ethical evaluation of AI-based technologies?
2. What conceptions of education do experts refer to, and how are these interpreted in the context of AI-based technologies?
3. What developments do experts perceive within the context of universities, particularly regarding AI-based technologies, and what mission do they derive from these developments?

4. What relevance do AI-based technologies hold for higher education institutions?

The aim of the qualitative study is to generate empirically based knowledge about how stakeholders working in higher education institutions, as well as students, perceive and assess developments related to the use and implementation of AI-based technologies in higher education. The structure of the project allows for an exploratory, theory-guided overview of the impact of AI-based technologies on predominant existing conceptions of education, the (ethical) evaluation of those changes and its relevance for ethical debates on AI-based technologies in the management and administration of higher education institutions.

2 Theoretical framework

2.1 AI-based Technologies in Higher Education Institutions

AI-based technologies in higher education institutions are important for our study in three respects: What technologies are available and how can they be classified, how are these technologies already being used, and what structural challenges do they pose for universities?

There are three main categories of AI-based technologies developed for and used in higher education institutions. Within the literature, those technologies are categorized based on their operational areas of application (Baker & Smith, 2019; Wannemacher & Bodmann, 2021; Zawacki-Richter et al., 2020):

1. Studying and learning (learner-facing)
2. Teaching and education (teacher-facing)
3. Management and administration (system-facing)

Further classifications can be made based on the aims of AI-based technologies. In their meta study, Zawacki-Richter et al. (2019, p. 11), for example, differentiate between "a) adaptive systems and personalization, b) assessment and evaluation, c) profiling and prediction, and d) intelligent tutoring systems" (see Figure 1).

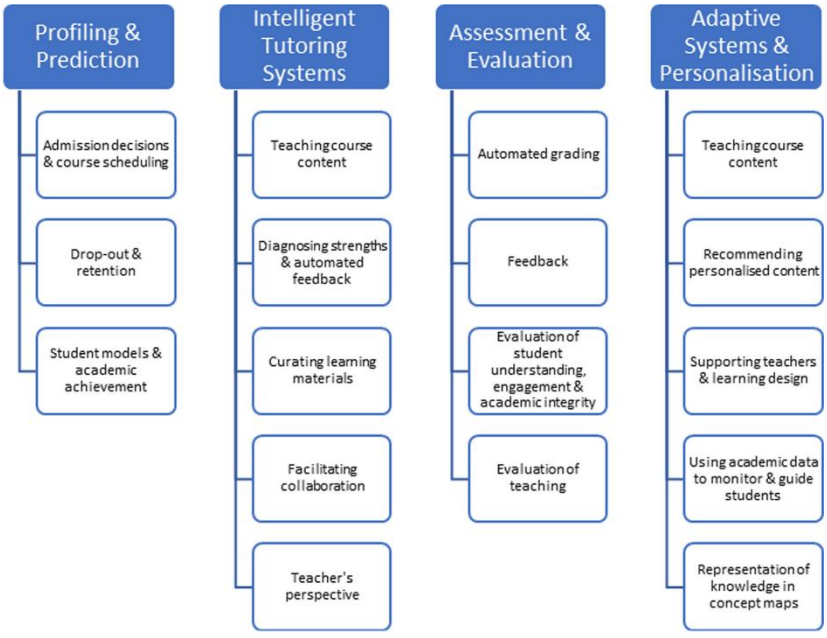

Figure 1: Typology according to Zawacki-Richter et al. (2019) as visualized by Bond et al. (2024, p. 4)

Gillani et al. (2023) distinguish between intelligent tutoring systems, assessment and feedback, coaching and counselling, (large) school systems-level processes and predicting outcomes as areas of application. Those categories can include the following exemplary technologies:

1. Educational Data Mining (EDM) and Learning Analytics (LA): EDM develops methods to predict student behaviour and success, while LA applies these methods to optimize educational processes for learners and institutions (Mai et al., 2023; Witt et al., 2020).
2. Intelligent Tutoring Systems (ITS), learning management systems (LMS) and AI-augmented Massive Open Online Courses (MOOCs): AI-based systems provide personalized tutoring and immediate feedback to enhance learning success (Mai et al., 2023). AI-based LMS offer personalized, adaptive environments tailored to users' knowledge and learning styles (Fardinpour et al., 2014). Although MOOCs can be perceived as educational tools, AI-augmented MOOCs can play a role in the management and administration of higher education institutions. AI-MOOCs collect learner data to improve engagement and predict dropouts or future success (Fauvel et al., 2018; Klobas et al., 2014).
3. Chatbots and Recommendation Systems: Support students by providing answers to administrative queries and recommending tailored content (Witt et al., 2020).

Within the context of higher education institutions, a study from the *Centrum für Hochschulentwicklung* shows that in Germany, external AI-technologies (e.g. Chat GPT-4, DeepL, MS Co-Pilot, ResearchRabbit, etc.) are often used by students (Hüsch et al., 2024). AI tools offered by universities themselves are still rarely used because, as of the 2023/24 winter semester, students are not yet aware of them or they are not yet available in many places (Hüsch et al., 2024). A study from the *Hochschulforum Digitalisierung* states that German higher education institutions are making good progress regarding the implementation of AI-based technologies for studying and teaching, that there is a higher sensibilization and that more than half of the students and teachers already use AI-based tools (Budde et al., 2024). 87% of higher education institutions claim that they are discussing AI-based technologies and aim at developing guidelines for their use.

However, also in this study, it appears as if most of the usage is limited to the use of external tools such as generative AI and that those technologies are mainly used regarding teaching and evaluation (Budde et al., 2024). The Digital Education Council Global AI Student Survey 2024 (Rong & Chun, 2024) finds that 86% of the students inquired use AI-based technologies for their studies. The study, however, does not provide information on the extent of AI technology implementation in higher education institutions. It does find, that 59% of the students wish for universities to increase their use of AI-based technologies- an indication that implementation may still be limited at many institutions (Rong & Chun, 2024).

In addition to classifying different AI technologies and accepting or implementing these technologies, it is important to consider the structural changes associated with them. Universities are facing the immense challenge of overcoming several structural obstacles. In addition to the aftermath of the coronavirus crisis, these primarily include the ecological crisis and the digital transformation, or more precisely, "new disruptive developments such as AI and other new and key-enabled technologies like biotech, nanotech, the Internet of Things (IoT), robotics, cloud computing, and machine learning" (Carayannis & Morawska-Jancelewicz, 2022, p. 3446). The emergence of new nationalisms and the weakening of liberal democracy can also be added to this list.

Above all, the adoption of digitalization, including AI, by universities represents a paradigm shift in which technology is seen as a complex, interconnected environment that enables and shapes digital learning and research (cf. Carayannis & Morawska-Jancelewicz, 2022).

These challenges relating to structural transformation concern the balance between societal demands and the autonomy of universities. Balancing academic autonomy and freedom with societal and political expectations requires universities to develop robust and resilient structures and strategies (cf. Carayannis & Morawska-Jancelewicz, 2022).

2.2 AI-based technologies in higher education – perspectives from philosophy of education

Education at (higher) education institutions takes place in a conglomerate of social, political, and economic contexts. Therefore, the nature, goals, and values behind the term (higher) education is a question that cannot be answered conclusively because conceptions change over time. Wollersheim (2023) finds that education

> quite obviously goes beyond the sum of what is known and has to do with the relationship between people and the world. In this respect, conceptions of education reflect people's respective understanding of themselves and the world, which in turn means that 'education' cannot be defined timelessly […] (p. 10).

Klafki (2018, p. 34) shows that educational goals and conceptions are a product of collective negotiation processes that result in "normative orientations". Therefore, the topic of digitalization and artificial intelligence (AI) in relation to education is also a subject of interest for the philosophy of education. Central in the debates is the question how digitalization and AI influence and change the conceptions and processes of education today or, in other words, how

they shape "normative orientations" regarding education. Wollersheim (2023, p. 15) for example finds that "education is an active achievement of the individual, which is based on the use of learning opportunities, but goes beyond this in a reflective and self-designing manner." Following from this understanding of the nature of education as an active, individual process of self-designing (*Selbstgestaltung*), the use of AI-based technologies in (higher) education ought to be designed to support individuals in their process of self-education (*Selbstbildung)* but cannot "make" educated people. In a similar fashion, Rapp et al. (2023, p. 43) emphasize the necessity of reflecting and defining central educational/pedagogical values as "requirements that educational technological innovations have to be oriented towards."

Throughout history, there have been multiple conceptions of education, each focusing on different and changing key normative aspects of education. In European intellectual history, the notion of guiding individuals towards a goal is central to various conceptions of education. Here, individuals are regarded as having innate talents and capacities that are to be cultivated through educational processes (Lederer, 2014).

The objective dimension of education (ideals of education) is juxtaposed with a subjective dimension (self-development) (Anzenbacher, 1999), which enables the individualization and thus concretization of educational ideals through autonomy. Kant's (1785, AA 4) definition of individuals as autonomous beings that bear responsibility for their actions adds a moral component to this process: in this sense, self-education not only stands for the "autonomous change of individuals, but also for an improvement of the world through individual development of their potential" (Hastedt, 2012, p. 10).

With the thoughts on the organization of educational processes, a third systematic, namely transitive dimension of the conceptions of education is developed (Anzenbacher, 1999). It is used to negotiate the mediation process between objective educational ideals and their subjective concretization.

Focusing on the Western perspective, the establishment of critical social theory in the 20th century added new facets to the debate on conceptions of education, particularly through critiques of

humanist and Christian tradition. Over time, the educational discourse branched out into a plurality of approaches, which cannot be discussed here in length. However, it can be stated that the concept of competence has become essential to the conceptions of education in both the 20th and 21st centuries.

This can further be illustrated by looking at national and international legal documents regarding the goal and objective of (higher) education. These documents mainly focus on three essential core aspects of tertiary education: personality development in the context of academic education, responsible and subject-specific use of acquired skills and knowledge, and preparation for the application of knowledge, methods and competencies in a professional working environment (e.g. European Commission, 2017a, 2017b; Magna Charta Universitatum, 2020; Wissenschaftsrat, 2015).

Values that have been central to the idea of education since at least the Enlightenment, namely social responsibility, also remain important.

From this preliminary overview, it can be concluded that certain normative key aspects have remained relevant and recur across conceptions of education over time:

- personal(ity) development and autonomy, emancipation and maturity,
- social responsibility,
- and the preparation for professional life within the broader context of society.

It can thus be assumed that those aspects bear a certain normative relevance and inform normative orientations regarding education relatively independent from social-historical contexts. It is thus obvious that the use of AI in higher education institutions should be assessed based on its influence of educational conceptions and processes: "A critical examination of the values, norms and assumptions inscribed in AI is required, as well as reflection on these in connection with educational theoretical considerations." (Rapp et al., 2023, p. 33). The main reason therefore is that, if those technologies impede key normative conceptions of education, this might indicate adverse effects of those technologies. Therefore, educational conceptions are relevant for the ethical assessment of those technologies.

2.3 Ethical issues of AI for higher education institutions

There is no doubt that sensitivity to ethical issues surrounding AI-based technologies in higher education is growing (Al-Zahrani & Alasmari, 2024.; Pardo & Siemens, 2014; Slade & Prinsloo, 2013; Yu & Yu, 2023; Zawacki-Richter et al., 2019). It is surprising that many research articles dealing with the ethical perspective emphasize that it has received too little attention to date. Proportionally speaking, ethics is underrepresented in the discourse. Schönmann and Uhl (2023, p. 435) state that "ethical implications […] find surprisingly little attention". Zawacki-Richter et al. (2019, p. 21) even describe it as a "dramatic lack of critical reflection of the pedagogical and ethical implications as well as risks of implementing AI applications in higher education" and Holmes et al. (2022, p. 505) confirm that there is a "disappointingly low level of interest" for those questions. In their meta-review of research in the field of AIEd, Bond et al. (2024) identify ethical issues as the biggest research gap.

We suspect that this contrasting analysis stems from very different concepts and expectations of ethics, and related research questions and designs: On the one hand, there is a range of work that addresses ethical problems of AI itself (such as privacy or bias, e.g., Miao et al., 2021) and addresses them for specific use in higher education. But few approaches that bring ethics into play at the level of fundamental philosophical concepts, for example by focusing on the

conception of education or on general, "big" questions about the mission and purpose of higher education, as we aim to do in this project (as described in 2.2).

Generally, it can be observed that ethical evaluations of AI-based technologies in higher education are either deontological or consequentialist, as Schönmann and Uhl (2023) find. This implies that the preoccupation with ethical issues of the use of AI-based technologies in the literature is often limited to the question of their compatibility with certain ethical principles (privacy, transparency, non-discrimination, etc.) (Johnson, 2017; Pardo & Siemens, 2014) or focus on the individual and societal consequences. A fundamental, overarching reflection that also takes cultural, societal, and social aspects in account is rather rare (Witt & Leineweber, 2020).

A recent discussion by du Boulay on AI and ethics exemplifies the often limited approach to ethical issues in higher education's use of AI technologies. Du Boulay (2023, p. 100) names two criteria for the ethical evaluation of learner-facing, teaching-facing and system-facing tools: they should do their "best" and "treat students equitably". The author considers the "big issue" to be the question of "how we can ensure that learners acquire more control over the data that is generated when they interact with educational technology and are protected from the misuse of their data by others" (Du Boulay, 2023, p. 103). The literature review on LA ethics presented by Tzimas and Demetriadis (2021) further confirms this thesis. The authors define six main ethical dimensions that figure in articles on the use of LA as a means of determining whether the use of LA is ethical: "Privacy; Transparency; Labelling; Data ownership; Algorithmic fairness; The obligation to act." (Tzimas & Demetriadis, 2021, p. 1109) The study finds that, within the literature, ethical concerns about the impact of AI-based technologies on learners are the highest, with questions of privacy being the most prevalent (Tzimas & Demetriadis, 2021). They furthermore find a strong emphasis on the responsibility of higher education institutions to take action (Tzimas & Demetriadis, 2021).

Although section 2.2 showed that reflections on the use of AI-based technologies in higher education from the perspective of educational philosophy, especially those considering conceptions of education, are ethically relevant, those aspects are hardly considered within the literature. The BiKIEthics project aimed at filling this gap.

3 Method

3.1 Research Method

A qualitative approach was chosen to answer the main research questions: ten semi-structured interviews (Misoch, 2019) with eleven representatives from the higher education sector and a focus group with five students from different disciplines were conducted in Germany and Austria between September and December 2022 and subsequently analysed using qualitative content analysis (Kuckartz, 2018; Mayring, 2015). The methodological approach of semi-structured interviews and a focus group made it possible to gain an explorative insight into the research field, while the evaluation method of qualitative content analysis offers a meaningful structuring of the material (Kuckartz, 2018).

3.2 Research Group

The research group consisted of two subgroups: 1) stakeholders with expertise in AI, education, higher education governance, or overlapping areas, and 2) students. All interviewees were recruited through direct, personal contact via email, based on their respective roles in the higher education sector. They were based at ten different institutions—including universities, technical universities (Technische Universitäten), universities of applied sciences (Fachhochschulen), and

a Ministry of Science—across five German federal states (Bavaria, North Rhine-Westphalia, Berlin, Hamburg, Schleswig-Holstein) to reflect variations in educational governance across the federal states. The sample consisted of a balanced mix of five women and six men, with participants ranging in age from 50 to 70 years. At the time of data collection, the participants held the following positions: professorships in Science and Technology Studies, Economics and Digitalization, Cognitive Systems, Empirical Educational Research, and Primary Education Pedagogy and Didactics; leadership roles in Science Didactics, Vice Presidency for Teaching and Studies, Scientific Leadership for Interactive Systems, as well as roles within a Ministry of Science. The students were recruited via a call disseminated in several courses at the University of Vienna during the winter term 2022/2023, within the disciplines of teacher education, educational sciences, and ethics/theology. This approach aimed to reach students whose academic backgrounds are connected to AI, education, and/or ethics. Accordingly, the group comprised Bachelor's and Master's students from the humanities, social sciences, and educational sciences. The student group consisted predominantly of women, with participants aged between 20 and 30 years.

In the context of this study, expertise is seen as specific "operational" and "contextual knowledge" (Meuser & Nagel, 2009, p. 470) which is defined by belonging to a certain context (professional field, workplace, studies, etc.). Experts were therefore selected according to the research interest, as it can be assumed that they have knowledge that is not available elsewhere (Meuser & Nagel, 2009). For this reason, all 16 interviewees are understood as experts in this research. Nevertheless, they reflect different facets of the field of investigation (e.g. researchers/teachers and learners), and these perspectives are highlighted in the analysis.

3.3 Data Collection

Semi-structured interviews are defined by a set of open-ended questions on specific topics, allowing participants to respond freely in their own words. These questions are developed in alignment with the research project and organized within an interview guide that provides structure and thematic focus. On one hand, the interview guideline ensures that a thematic framework and focus are maintained during the interview, that relevant questions are included, that the data set is comparable, and that the communication follows a defined course (Misoch, 2019). On the other hand, the openness of the approach allows flexible adaptations to the respective interview situation, as well as individual focus and guidance of content by the interviewees. During the implementation phase of the interviews, minimal adjustments were made to the interview guide and adapted to the respective interview situation. Focus groups are also characterized by open-end questions and, in particular, participant interaction, offering insights into which topics are relevant to a specific group – in this case, students (for details of the interview and focus group guidelines, see appendix).

Informed consent was obtained from all participants, and they were fully informed about the nature and purpose of the project prior to their participation, including how their data would be used, stored, and protected in accordance with data protection regulations. All interviews and the focus group were conducted in German, on-site in a face-to-face setting and were recorded and transcribed by an external transcription service provider. The duration of the interviews and the focus group was approximately one hour. Subsequently, all personal data was anonymized during data processing, analysis and interpretation.

3.4 Data analysis

The collected data was analysed using qualitative content analysis with MAXQDA. Qualitative content analysis is characterized by a rule-based approach consisting of several sub-steps, guided

by the research question (Mayring, 2015). Specifically, the "structuring content analysis" approach was applied, which involves organizing and summarizing the material according to specific content areas and themes (Mayring, 2015, pp. 68, 99). This method is iterative, meaning that the process of coding and category refinement is repeated and continuously adapted based on the material. Based on the research questions, deductive categories were developed to guide the initial coding of the material. These categories included: conceptions of education, current developments, the relevance of AI-based technologies, transformations of conceptions of education, and the mission of higher education institutions. As the coding progressed, the material was further structured, and inductive codes were added to complement the deductive framework. Examples of inductive codes include "education as competence transfer" and "education's societal role".

4 Results and Discussion

The structure of the results is based on the coding framework developed during data analysis. These five categories emerged from the data analysis and will be presented below:

1. Conceptions of education: education as competence transfer and the societal role of education

This section presents and discusses the participants' underlying conceptions of education. Two key components emerged: education as the transfer of competence and education as a societal function.

2. Structural shifts: pedagogical practices, knowledge production, market dynamics

To contextualize the role of AI in education, this section explores participants' views on digitalization and broader transformation processes. AI-based technologies are interwoven with many of these processes, highlighting existing shortcomings while also introducing new challenges.

3. The relevance of AI-based technologies: between optimization, efficiency, and self-determination

This section outlines central lines of discourse regarding the use of AI-based technologies in higher education institutions, revolving around themes of optimization and possible options for usage, efficiency, and potential for self-determination within learning environments.

4. Transformation(s) of conceptions of education? Between expansion and erosion

Conceptions of education are re-evaluated in the context of digital transformations. Critical perspectives on optimization and behaviouristic perceptions on education and AI are discussed, followed by a reconsideration of the two main aspects of conceptions of education outlined in section 4.1.

5. Actions required for higher education institutions: mission statements and ethical reflections

In closing, current challenges of higher education institutions are presented as perceived by the participants, with particular emphasis on mission and ethical reflections.

To provide a better overview and more detailed analysis and classification of the results, we present the discussion for each category individually.

4.1 Conceptions of education: Education as transfer of competence and the societal role of education

4.1.1 Results

Regarding conceptions of education, two levels emerged: participants discussed both the conception of education at universities and their own understanding of education. At the institutional level, some interviewees pointed out that there is no universal definition or shared conception of education in higher education; rather, universities interpret and apply different conceptions of education. Universities often rely on an implicit understanding of education that is neither clearly articulated nor consistently regarded as guiding everyday academic life:

> The university doesn't necessarily engage in an educational-theoretical discourse in the way that education researchers might. But it tries to establish it. And that is also what is expected of the university today—that it takes a clear position. (Interview 2[1])

One participant also emphasized that external actors also play a role in shaping conceptions of education. According to this view, there are "factors or players who expand the current conception of education or try to bring certain aspects into it" (Interview 6).

With regard to their own understanding of education, it became apparent that the participants did not refer to a clear-cut definition but rather expressed broader notions of education as a continuous process beginning in childhood. However, two interrelated aspects were perceived as central by the participants: education as competence transfer and the societal role of education.

Education as competence transfer

Participants agreed that the transmission of specific competencies should be a part of university education and a university's educational objective. Competence was understood to include both subject-specific knowledge and more general skills (e.g. information literacy) as well as social competencies, with both of these viewed as interconnected. Subject-specific knowledge was associated with the practical application of knowledge, particularly in terms of preparing for professional life and ensuring employability. However, it was generally emphasized that while foundational knowledge is important, greater emphasis should be placed on comprehension and the ability to contextualize. Relevant knowledge was not seen as fixed but rather as dynamic and subject to change. One participant therefore criticized the increasing overemphasis on employability, arguing that it reduces conceptions of education to merely "useful knowledge":

> Education is no longer about developing self-determination as human beings, as political human beings, while at the same time, of course, also developing competencies that enable concrete action in specific areas of society—whether that be science, industry, or the economy. The conception of education at a university includes both of these aspects: practical skills that can be applied in the world, and, through education, a broader understanding of the world, which in turn allows for the further development of one's human potential. (Interview 1)

This discussion of competences—from specialization to broader life skills—underscores the intrinsic link between education and society, emphasizing that competences acquired through education are ultimately transferred to and enacted within society.

The societal role of education

[1] All interviews were conducted in German; presented quotes have been translated by the authors.

The participants' understanding of competence, knowledge and skills is linked to and defined by broader societal conditions. Abilities acquired during studies—such as critical thinking, reflection, and especially problem-solving skills—are seen as fundamental competencies for social coexistence and are intended to promote active participation in shaping society. The acquisition of such skills is also linked to "personality development" (Interview 3). Educational processes are therefore understood as lifelong learning, for which universities should prepare students and through which expertise is established in society: science-based decision-making processes are intended to be transferred into society.

Students' perspectives

The perspectives of the students in the focus group reflected those of the interviewees. They associated education with critical thinking—both in terms of information literacy and in relation to broader societal issues. While they regarded academic studies as equally valuable an investment in one's personal future as vocational training, they placed particular emphasis on social skills. They differentiated between academic, social, and cultural education, highlighting social competencies as especially important.

4.1.2 Discussion

As outlined in the theoretical section above, certain key aspects of the conception of education have remained relevant over time and are reflected in various educational concepts, despite the constant changes in the contexts and conditions for implementing education. The following elements of education are of fundamental importance (e.g. Wissenschaftsrat, 2015):

- personal development and autonomy, emancipation and maturity,
- social responsibility, and
- preparation for working life in a broader social context.

We have argued that these three aspects are therefore likely to be of some normative relevance and continue to influence normative orientations in education. However, it should also be noted that concrete ideas about education are complex and subject to constant change (Wollersheim, 2023): How personal development, social responsibility and career preparation can be achieved through education varies greatly depending on the context. The interviews confirm that there is no singular understanding of education; negotiation processes occur in various contexts (e.g. university-specific, country-specific) and are influenced by multiple factors. The conceptions of education presented by the interviewees followed some basic assumptions regarding the definition and objectives of education. A distinction was made between the subject-specific and professional competence level and the societal level (social responsibility).

The responses also clearly show that the aspect of autonomous self-education, as it appears in classical educational theory and the objectives of higher education, is sometimes or often neglected at today's universities. Students, on the other hand, see the development of social and personal skills as a central function of higher education.

The participants emphasize that universities need to engage in self-reflection on their own understanding of education, but that this has not been done sufficiently to date. However, they emphasize how personality development is a prerequisite for social coexistence and the maintenance of democracy, and assign an important role to universities in this regard.

4.2 Structural shifts: pedagogical practices, knowledge production, market dynamics

4.2.1 Results

AI-based technologies impact the higher education system on several levels, shaping pedagogical practices, knowledge production and market dynamics. The digitalization of universities has accelerated in recent years, particularly during the pandemic, affecting teaching, assessment formats, and the use of AI-based tools. Interviewees agreed that the shift toward digital or hybrid teaching formats will persist and intensify. Change was perceived as a constant (Interview 7), unfolding slowly and in a controlled manner (Interview 4). The broader digital transformation is accelerating, although it "has not yet been fully integrated into practice" (Interview 5). This transformation is reshaping both the labour market and academic disciplines. In response, AI competencies are being integrated into curricula, and new professorships focusing on AI are being established. These developments highlight the university's position within complex societal transformation processes.

With regard to knowledge production, one participant emphasized the opposing logics at play: while universities aim to generate disruptive knowledge that challenges the status quo, algorithms "always learn from the past, never from the future" (Interview 1). Closely related to this, true innovation requires freedom and the absence of surveillance, yet current AI systems increasingly undermine that freedom. As one participant put it: "If everything done in a university is traceable, it becomes implicitly or explicitly controllable" (Interview 1).

There are also structural risks. Universities rely on commercial platforms and pay high fees, funded by public money. Yet the generated data is fed into private algorithms, creating a "structural danger" (Interview 1). Without data sovereignty, ministries are dependent on private providers, integrating universities into commercial systems. As a result, universities' innovative capacities shift into the private sector. Data-driven steering mechanisms influence decisions beyond public academia. Thus, working or studying at universities increasingly means ceding control to private actors.

4.2.2 Discussion

The experts' responses clearly demonstrate the extent to which universities are being challenged by various structural transformations. As various studies (Carayannis & Morawska-Jancelewicz, 2022; Rodríguez-Abitia & Bribiesca-Correa, 2021) have highlighted, the participants also view this as a highly complex, disruptive and risky transformation with the potential to become a new paradigm for universities. No clear and consistent diagnoses could be identified among the participants, and the complexity of the situation is reflected in the interviews, too.

The literature also discusses issues of autonomy and heteronomy in adaptation processes at individual and organizational levels. In our opinion, the experts address the difficulties universities face in responding autonomously to external pressure to adapt more than previous studies have done. In this context, external IT service providers are perceived as a threat due to the fear that the creativity of adaptation will be outsourced and beyond the control of universities. Autonomy appears to be the most important aspect for universities (see also Magna Charta Universitatum, 2020). Competitive pressure also plays a significant role, a topic that has not yet been given much attention to in the literature.

4.3 The relevance of AI-based technologies: between optimization, efficiency and self-determination

4.3.1 Results

The question of what exactly is meant by AI-based technologies arose repeatedly in the interviews (e.g. Interview 10), as the definition shapes the underlying perspectives and approaches. This definitional ambiguity is also tied to broader discourses on the development and direction of AI-based technologies within universities, as well as to the fundamental question of how AI relates to society at large.

Additionally, two main arguments emerged, which are not in contradiction to one another: one focuses on optimization and efficiency, and the other on self-determination. According to the interviewees, AI-based technologies have the potential of optimizing, accelerating and simplifying processes, which are viewed as positive effects (e.g. by making study progress easier for students). The potential of AI-based technologies is therefore primarily seen in the context of teaching and learning, such as organizing classes, allocating rooms, arranging appointments, and handling general administrative tasks through the use of AI-based coordination tools. AI-based technologies might further survey the reasons why students drop out early and can provide crucial insights and opportunities for intervention. In student counselling, AI-tools like chatbots and recommendation systems can provide personalized guidance and support on study progress data, thereby preventing frequently occurring problems.

The second aspect, self-determination, is emphasized by the observation that AI-based technologies enable the outsourcing of certain tasks in teaching and learning environments, thereby creating space for new forms of engagement. According to the participants, AI-based technologies would offer a range of options for expanding conventional teaching methods. Regarding learning processes, the individual support options were again emphasized. A key aspect here is also the "self-determined teaching and learning with personal responsibility" (Interview 1); learning processes should therefore continue to be linked to a certain "freedom of action" (Interview 6) on the part of learners in how they engage with technological tools. AI-based technologies, such as intelligent tutoring systems, could therefore help with learning management, map learning progress, provide individual intelligent feedback and adaptive support in the further learning process. Here too, "self-determined teaching and learning with personal responsibility" (Interview 1) is central.

Students highlighted common problems related to studying at higher education institutions (such as navigating campus, organizing studies etc.) and believed that AI-based technologies might help by offering individual support or general guidance. They reinforced the optimization aspect, emphasizing the potential for outsourcing activities, positioning AI-based technologies as support tools for individuals. Decision-making processes could also be simplified and improved, thereby enabling individuals to live a "better life" (focus group).

4.3.2 Discussion

In relation to the literature on AI-based technologies in higher education, it is striking that participants view AI as unclear hype. According to them, this perception prevents the effective implementation of AI at universities and hinders well-planned development. Despite the extremely helpful categorizations in the literature (see, for example, Baker & Smith, 2019; Zawacki-Richter et al., 2019), experts do not use them. The results show that even experts feel uncertain about how to proceed due to the impression that the field is disordered.

However, both experts and students in the focus group recognize the potential of AI technologies in higher education to optimize processes and support autonomy. They mention processes related to the organization and implementation of teaching and learning, and students hope that AI will provide general guidance, such as campus orientation. Nevertheless, these advantages are merely potential, such as reducing student dropout rates, and the interviewees do not discuss real-world implementations, such as chatbots, learning analytics or recommendation systems. Interestingly, responsibility emerges among the experts as a central moral value here (see our discussion in section 2.3), both as a yardstick for assessing AI-enhanced education (AIEd) and for evaluating it as an extension of self-determination in teaching and learning processes.

The focus group emphasized that students wish AI-based technologies to provide guidance when making important decisions. Technologies can support a self-determined choice of a course of study and profession.

4.4 Transformation(s) of conceptions of education? Between expansion and erosion

4.4.1 Results

In terms of the effects of AI-based technologies on predominant conceptions of education, two main points of criticism emerge: the emphasis on optimization in relation to education, and the way these technologies operate. In addition, their impact was assessed in relation to the two key aspects of conceptions of education identified in the interviews: competence transfer and the societal role of education.

Participants argued that when educational transformation processes are viewed through the lens of optimization in the context of AI, an alignment between "university learning and more commercial forms of learning" becomes apparent, based on the "illusion that learning can actually be represented through quantitative indicators" (Interview 1). According to one interviewee, if efficiency concerns take precedence, this could also lead to a more pragmatic approach to education, resulting in a "streamlined" student experience (Interview 5).

Additionally, AI-based technologies sometimes work with so-called "predictive analytics", which might have negative consequences for students and foster a "behaviourist" understanding of education. This "regression to behaviourism" contrasts sharply with the view that education is a "situational and context-specific constructive competence" (Interview 8). It is therefore incompatible with a broader conception of education:

> But when we talk about a broader conception of education, one that is concerned with what kinds of competencies a person acquires—subject-specific competencies, but also social and problem-solving skills—there are many components involved. (...) Still, the aim is to pursue a broad approach, in line with a humanistic, European ideal of education, to truly foster learning and not just the fulfilment of checkboxes on, say, multiple-choice exams. I think this is heading in a completely wrong direction. It's prone to error, and predictive analytics can do serious injustice to people. (Interview 8)

This again highlights the dual focus on competence transfer and the broader societal aims of education.

Education as competence transfer and AI

Conceptions of education appear to be undergoing transformations:

> Data literacy (...) is probably not a classical element of the traditional conception of education, and yet today we might say that a person leaving university should be able to

> engage with data in a reflective way and have a certain understanding of it, because in today's society that is part of being educated. And data literacy is a good example, I think, of something strongly pushed by actors outside the university as well. (...) On the one hand, there's an implicit part that draws from one's own background, experience, and habitus, and on the other hand, there are always new influences shaping what education is supposed to achieve—which we in higher education also take note of. (Interview 6)

However, this transformation does not mean that fundamental competencies are dissolved or replaced. The combination of "knowledge and expertise" remains as a "minimal definition," while competencies such as "critical thinking" are being expanded—for example, through data literacy (Interview 6) or philosophical aspects like the relationship between humans and machines (Interview 2). Participants viewed the inclusion of AI-related skills and competencies as essential in light of the influence of digitalization and AI-based technologies on educational processes. Existing curricula should thus be expanded to reflect these developments.

Students should become not only "competent users" who reflect on risks and dangers, but also individuals who understand their potential role as "drivers of new developments" (Interview 2). One interviewee associated this shift with a move toward "utilizable knowledge" (Interview 1), which departs from the traditional university ideal driven by curiosity and further contributes to its devaluation.

Education, Society and AI

The use of AI-based technologies also impacts the relationship between education and society; here too, the participants' views reflect an expanded conception of education. Digital transformation is understood as part of a broader structural change that must be addressed in both education and societal contexts:

> Education is something, that must be seen in the context of broader societal challenges, but of course it is also something that the individual ultimately has to acquire in order to represent a self-determined role within this social structure. So, when looking at cultural change, the culture of digitality emerges from communal processes, naturally shaped by technologies, but the necessity to deal with complexity is not primarily about technology. (…) It is really about contributing to communal processes according to individual conditions. Ultimately, it is also about participating in society's handling of problems, challenges, and complexities. (Interview 4)

Education should therefore not be oriented towards the requirements of the labour market or technocratic goals but rather anchor fundamental skills in society. A deeper understanding of the digital world is needed to enable active and informed participation in cultural, political and social processes. Education should foster responsible citizens who can understand, influence and shape the (digital) world. To prevent negative developments, the education system must, according to the participants, be adapted to the challenges of digital culture and support critical engagement in democratic processes.

4.4.2 Discussion

Participants see the fundamental change in the conception of education brought about by AIEd as the loss of education without a purpose, which is now solely "behaviouristic" and focused on measurable student performance. Underlying this is a European humanist ideal of education, which we reconstructed in section 2.2. This ideal is under pressure from AI technologies, which, as technologies, merely suggest functional, behaviour-oriented optimization. There is a clear fear that AIEd will introduce technocratic perspectives into higher education institutions and further

push the already pressured educational goals of these institutions into the background, or even make them impossible to achieve.

This connection cannot be captured by an ethics of AIEd that focuses solely on concrete, factual issues such as privacy, transparency and accountability. The results confirm Rapp et al.'s (2023) assertion that it is necessary to relate established AI technology norms to educational theory, philosophy and ethics.

In this context, the normative goals of higher education (personal development, social responsibility and career preparation), which we outlined above, are also brought into play and problematized. The critical conception of education, which enables participation in and the responsible shaping of society and the world of work, often emerges. To this end, as we have theoretically reconstructed (Section 2.2), education must not be rigidly understood but rather expanded contextually through new aspects of competence. In turn, universities must be prepared to adapt.

The normative basic assumptions remain in place in the context of AI in higher education but are also reinforced, expanded, or emphasized in their relevance and function. According to the interviewees, AI-based technologies have two roles here: they are seen as instruments for imparting education and as a feature of a broader societal transformation. This transformation entails far-reaching developments that also have consequences for the higher education sector and may require a response. Due to the link between education and participation in democratic processes, a need for action is once again recognized. Educational processes are therefore individual yet contextual (Klafki, 2018; Rapp et al., 2023).

The results reflect the necessary openness and situatedness of educational processes and emphasize the importance of critically examining the normative values embedded in technologies designed for or used within higher education. The development of these technologies cannot be seen as purely causal but should be understood as a co-productive process.

4.5 Actions required for higher education institutions: mission statements and ethical reflections

4.5.1 Results

In the interviews, it became apparent that there is a need for a fundamental clarification of the self-understanding and goals of higher education institutions—for example, through the development of institutional profiles or mission statements. A central question in this regard was how these institutions want to position themselves in relation to technological transformation processes. The interviewees emphasized that higher education institutions need to reflect on the core elements of teaching and learning and consider the role digitalization should play in this context. The goal should be to establish guidelines for the use of AI (Interview 9), while also fostering critical engagement with AI on different levels (teaching and learning, curricula, ethical and societal questions, etc.):

> I would assume that it is extremely helpful for the university not to address such questions [regarding AI] on a case-by-case basis in a very limited context—and only in response to protests that have arisen—but rather to have engaged in joint reflection on a more abstract normative level and to have put this into writing in something like a mission statement. That way, it becomes possible to derive how certain decisions can be justified. (Interview 5)

The participants highlighted the need to critically examine the purpose and ethical justification of AI use in higher education. These reflections should be integrated early in the development process to ensure responsible use. Since both anticipated and unforeseen ethical issues may arise, openness in development is essential (Interview 5). Quality control and transparency in data use are crucial, especially as current standards are considered insufficient. Interviewees focused on data security and highlighted the necessity of transparency regarding data use. AI applications should remain voluntary, with clear opt-out options and user-friendly design. The aim is to ensure that students are actively involved in implementation processes and to increase acceptance of technologies and applications.

4.5.2 Discussion

Experts emphasize the need for universities to re-establish their institutional identity in the context of AI. However, only a few studies address the necessity and form of institutional change at universities. Carayannis and Morawska-Jancelewicz (2022) refer to the need to consider higher education transformation in the context of digital technologies as social innovations, and to incorporate this into the missions of higher education institutions. "Universities should take the active role in creating and defining future visions and only responding to them. They need to redefine their roles and the way they act" (Carayannis & Morawska-Jancelewicz, 2022, p. 3466). It seems no other study documents and analyses relevant work on university mission statements. The results highlight the need for further research in this area. Further relevant documents may be found in the AI strategies and corresponding guidelines of universities.

With regard to ethical considerations, the experts highlight common ethical issues and suggest ways to address them. These can also be found in the AI ethics literature mentioned above (Section 2.3). The normative understanding of education also plays an important role here, as it emphasizes that students should be involved in the implementation of AI in higher education organizations, for example.

5 Conclusion

In our article, we explored the intersection of AI and higher education, with a particular focus on the ethical dimensions and educational conceptions influenced by the digital transformation of universities. With AI-based technologies becoming increasingly integrated into academic environments, it is becoming ever more urgent to understand their impact on the core values, missions and responsibilities of higher education institutions.

At the heart of this analysis lies the question: To what extent do experts perceive a link between conceptions of education and the ethical evaluation of AI-based technologies? This includes an analysis of the conceptions that education experts refer to and how these are interpreted in the context of AI-based technologies; the developments they perceive within universities – particularly regarding AI – and the mission they derive from these; and the relevance they attribute to AI-based technologies for higher education institutions.

Our aim is to supplement the ethical discourse on AIHEd with a broader perspective that encompasses educational philosophy. Methodologically, the study employed an exploratory qualitative approach, conducting semi-structured interviews with educational professionals and a focus group with students. This approach enabled an in-depth exploration of the nuanced perspectives and experiences within the higher education sector.

The study found that conceptions of education among stakeholders are multifaceted, encompassing the transfer of competencies (both subject-specific and social), fostering personal

development and fulfilling societal roles. While AI-based technologies are widely regarded as tools for optimization, efficiency and personalized support, their adoption also raises concerns about the erosion of autonomy, technocratic reductionism and the potential loss of broader educational ideals.

Participants emphasized the necessity for universities to critically reflect on their own missions and articulate clear guidelines and ethical frameworks for AI use. They cautioned against an overemphasis on quantifiable outcomes and advocated continued focus on personal growth, social responsibility and democratic participation. The research highlighted that, while AI offers promising opportunities, it also challenges universities to safeguard their foundational values amidst rapid technological change.

In summary, our article emphasizes the importance of integrating ethical reflection into the digital transformation of higher education to ensure that technological innovation remains aligned with the broader purposes and aspirations of education.

The conducted study was exploratory and broad in scope, providing an extensive overview of current discourses surrounding AI and education. Consequently, the results offer breadth rather than in-depth analysis, particularly regarding specific AI-based tools and their implementation. Future research could build on these findings by conducting in-depth investigations of specific areas of AI implementation in higher education or by focusing more closely on particular stakeholder groups, such as students, whose perspectives are included but remain relatively underrepresented in this study.

Of particular interest is also the question of whether and how higher education institutions are transforming their self-conception in the wake of technological change, for example by revising their mission statements. Our observations indicate that such reflective work, which experts deem essential and pivotal, is already underway in various settings. For the future of higher education in the context of AI, we believe it is essential that universities answer fundamental questions: what kind of university do they want to be, for what kind of society, and what is their goal in educating people at universities today?

However, to take into account the close link between educational ideas and higher education development in the context of AI, as we have demonstrated, higher education policies must also be adapted. Incentive structures for the transformation of universities in the context of AI, such as funding programs, should, in future, take into account the fact that AIHEd influences ideas about education, and their integration must therefore be accompanied by considerations of the current and future goals of higher education (cf. van Elk et al., 2024).

References

Al-Zahrani, A. M., & Alasmari, T. M. (2024). Exploring the impact of artificial intelligence on higher education: The dynamics of ethical, social, and educational implications. *Humanities and Social Sciences Communications, 11*(1). https://doi.org/10.1057/s41599-024-03432-4

Anzenbacher, A. (1999). Bildungsbegriff und Bildungspolitik. *Jahrbuch Für Christliche Sozialwissenschaften, 40,* 12–37. https://www.uni-muenster.de/Ejournals/index.php/jcsw/article/view/258

Baker, T. & Smith, L. S. (2019). *Educ-AI-tion Rebooted? Exploring the future of artificial intelligence in schools and colleges*. https://media.nesta.org.uk/documents/Future_of_AI_and_education_v5_WEB.pdf

Bond, M., Khosravi, H., Laat, M. de, Bergdahl, N., Negrea, V., Oxley, E., Pham, P., Chong, S. W. & Siemens, G. (2024). A meta systematic review of artificial intelligence in higher education: A call for increased ethics, collaboration, and rigour. *International Journal of Educational Technology in Higher Education, 21*, 4. https://doi.org/10.1186/s41239-023-00436-z

Bozkurt, A. (2024). GenAI et al.: Cocreation, Authorship, Ownership, Academic Ethics and Integrity in a Time of Generative AI. *Open Praxis, 16*(1), 1–10. https://doi.org/10.55982/openpraxis.16.1.654

Budde, J., Tobor, J., & Friedrich, J. (2024). Blickpunkt – Künstliche Intelligenz: Wo stehen die deutschen Hochschulen? Hochschulforum Digitalisierung. https://www.che.de/download/blickpunkt-kuenstliche-intelligenz-wo-stehen-die-deutschen-hochschulen/

Carayannis, E. G. & Morawska-Jancelewicz, J. (2022). The Futures of Europe: Society 5.0 and Industry 5.0 as Driving Forces of Future Universities. *Journal of the knowledge economy, 13*(4), 3445–3471. https://doi.org/10.1007/s13132-021-00854-2

Coeckelbergh, M. (2024). *Why AI undermines democracy and what to do about it*. Polity.

Du Boulay, B. (2023). Artificial Intelligence in Education and Ethics. In *Handbook of Open, Distance and Digital Education* (pp. 93–108). Springer, Singapore. https://doi.org/10.1007/978-981-19-2080-6_6

European Commission (2017a). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on a renewed EU agenda for higher education. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52017DC0247

European Commission (2017b). Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Strengthening European Identity through Education and Culture. The European Commission's contribution to the Leaders' meeting in Gothenburg, 17 November 2017. https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX%3A52017DC0673

Fardinpour, A., Pedram, M. M., & Burkle, M. (2014). Intelligent Learning Management Systems: Definition, Features and Measurement of Intelligence. *International Journal of Distance Education Technologies (IJDET), 12*(4), 19-31. https://doi.org/10.4018/ijdet.2014100102

Farrokhnia, M., Banihashem, S. K., Noroozi, O., & Wals, A. (2024). A SWOT analysis of ChatGPT: Implications for educational practice and research. *Innovations in Education and Teaching International, 61*(3), 460–474. https://doi.org/10.1080/14703297.2023.2195846

Fauvel, S., Yu, H., Miao, C., Cui, L., Song, H., Zhang, L., Li, X., & Leung, C. (2018). Artificial Intelligence powered MOOCs: A brief survey. In *2018 IEEE International Conference on Agents (ICA)* (pp. 56–61). IEEE. https://doi.org/10.1109/AGENTS.2018.8460059

Gillani, N. (2023). Unpacking the "Black Box" of AI in Education. *Educational Technology & Society, 26*(1), 99–111. https://doi.org/10.48550/arXiv.2301.01602

Guan, X., Feng, X. & Islam, A. A. (2023). The dilemma and countermeasures of educational data ethics in the age of intelligence. *Humanities and Social Sciences Communications, 10*(1). https://doi.org/10.1057/s41599-023-01633-x

Hastedt, H. (2012). *Was ist Bildung? Eine Textanthologie. Reclams Universal-Bibliothek / 19008*. Reclam.

Holmes, W., Porayska-Pomsta, K., Holstein, K., Sutherland, E., Baker, T., Shum, S. B., Santos, O. C., Rodrigo, M. T., Cukurova, M., Bittencourt, I. I., & Koedinger, K. R. (2022). Ethics of AI in Education: Towards a Community-Wide Framework. *International Journal of Artificial Intelligence in Education, 32*(3), 504–526. https://doi.org/10.1007/s40593-021-00239-1

Hüsch, M., Horstmann, N., & Breiter, A. (2024). *CHECK - Künstliche Intelligenz in Studium und Lehre - die Sicht der Studierenden im WS 2023/2024*. https://www.che.de/download/check-ki-2024/

Johnson, J. A. (2017). Ethics and Justice in Learning Analytics. *New Directions for Higher Education, 2017*(179), 77–87. https://doi.org/10.1002/he.20245

Kant, I. (1785). Grundlegung zur Metaphysik der Sitten. In Preußische Akademie der Wissenschaften (Ed.), *Werke (Berlin 1902ff.),* Bd. 4 (AA) (Reprint 1968). de Gruyter. https://korpora.org/kant/aa04/385.html

Klafki, W. (2018). An welchen Werten sollten sich pädagogische Entscheidungen orientieren? In *Erziehungswissenschaftliche Reflexion und pädagogisch-politisches Engagement* (pp. 31–50). Springer VS, Wiesbaden. https://doi.org/10.1007/978-3-658-18595-4_4

Klobas, J. E., Mackintosh, B., & Murphy, J. (2014). The Anatomy of MOOCs. In P. Kim (Ed.), *Massive open online courses: The MOOC revolution* (pp. 1–22). Routledge.

Kuckartz, U. (2018*). Qualitative Inhaltsanalyse: Methoden, Praxis, Computerunterstützung* (4th ed., revised). *Grundlagentexte Methoden*. Beltz.

Lederer, B. (2014). *Kompetenz und Bildung. Eine Analyse jüngerer Konnotationsverschiebungen des Bildungsbegriffs und Plädoyer für eine Rück- und Neubesinnung auf ein transinstrumentelles Bildungsverständnis* (1st ed.). Innsbruck University Press.

Magna Charta Universitatum. (2020). *The Magna Charta Universitatum*. https://www.magna-charta.org/magna-charta-universitatum/mcu2020

Mai, T. T., Crane, M., & Bezbradica, M. (Eds.). (2023). *Educational data mining und learning snalytics: Ein maschinell generierter Forschungsüberblick.* Springer Fachmedien Wiesbaden GmbH.

Miao, F., Holmes, W., Huang, R. & Zhang, H. (2021). *AI and education: Guidance for policymakers*. UNESCO. https://doi.org/10.54675/PCSP7350

Mayring, P. (2015). *Qualitative Inhaltsanalyse: Grundlagen und Techniken* (12th ed., completely revised and updated). *Beltz Pädagogik.* Beltz.

Meuser, M., & Nagel, U. (2009). Das Experteninterview — konzeptionelle Grundlagen und methodische Anlage. In *Methoden der vergleichenden Politik- und Sozialwissenschaft* (pp. 465–479). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-91826-6_23

Misoch, S. (2019). *Qualitative Interviews* (2nd Ed., expanded and updated). De Gruyter Studium. De Gruyter. https://doi.org/10.1515/9783110545982

Pardo, A., & Siemens, G. (2014). Ethical and privacy principles for learning analytics. *British Journal of Educational Technology, 45*(3), 438–450. https://doi.org/10.1111/bjet.12152

Rapp, F., Vogel, C., & Deimann, M. (2023). Künstliche Intelligenz. Eine bildungstheoretische Annäherung aus Sicht kritisch-konstruktiver Didaktik. In C. de Witt, C. Gloerfeld, & S. E. Wrede (Eds.), *Künstliche Intelligenz in der Bildung* (pp. 31–45). Springer VS. https://doi.org/10.1007/978-3-658-40079-8_2

Rodríguez-Abitia, G. & Bribiesca-Correa, G. (2021). Assessing Digital Transformation in Universities. *Future Internet, 13*(2), 52. https://doi.org/10.3390/fi13020052

Rong, H., & Chun, C. (2024). Digital Education Council Global AI Student Survey 2024: AI or Not AI: What Students Want. https://www.digitaleducationcouncil.com/post/digital-education-council-global-ai-student-survey-2024

Schönmann, M., & Uhl, M. (2023). Eine ethische Perspektive auf KI in der Bildung. In C. de Witt, C. Gloerfeld, & S. E. Wrede (Eds.), *Künstliche Intelligenz in der Bildung* (pp. 433–453). Springer VS. https://doi.org/10.1007/978-3-658-40079-8_21

Slade, S., & Prinsloo, P. (2013). Learning analytics: Ethical issues and dilemmas. *American Behavioral Scientist, 57*(10), 1510–1529. https://doi.org/10.1177/0002764213479366

Tzimas, D., & Demetriadis, S. (2021). Ethical issues in learning analytics: a review of the field. *Educational Technology Research and Development, 69*(2), 1101–1133. https://doi.org/10.1007/s11423-021-09977-4

van Elk, N., Filipović, A., Tröbinger, C., Michl, J., & Unterreiter, L. (2024). *Ethics of AI-based Technologies in the Management and Organization of Higher Education Institutions. Recommendations for policy in the areas of funding, education, and higher education.* https://doi.org/10.13140/RG.2.2.17980.62085

Wannemacher, K., & Bodmann, L. (2021). Künstliche Intelligenz an den Hochschulen: Potenziale und Herausforderungen in Forschung, Studium und Lehre sowie Curriculumentwicklung (Arbeitspapier / Hochschulforum Digitalisierung No. 59). Hochschulforum Digitalisierung. https://hochschulforumdigitalisierung.de/sites/default/files/dateien/HFD_AP_59_Kuenstliche_Intelligenz_Hochschulen_HIS-HE.pdf

Wissenschaftsrat. (2015). Empfehlungen zum Verhältnis von Hochschulbildung und Arbeitsmarkt. Zweiter Teil der Empfehlung zur Qualifizierung von Fachkräften (Drs. 4925-15). Wissenschaftsrat.

Witt, C. de, & Leineweber, C. (2020). Zur Bedeutung des Nichtwissens und die Suche nach Problemlösungen. *MedienPädagogik: Zeitschrift Für Theorie Und Praxis Der Medienbildung, 39*, 32–47. https://doi.org/10.21240/mpaed/39/2020.12.03.X

Witt, C. de, Rampelt, F., & Pinkwart, N. (2020). *Whitepaper „Künstliche Intelligenz in der Hochschulbildung“*. https://doi.org/10.5281/zenodo.4063722

Wollersheim, H. W. (2023). Bildung durch Künstliche Intelligenz ermöglichen. Ein Beitrag aus bildungstheoretischer Perspektive. In C. de Witt, C. Gloerfeld, & S. E. Wrede (Eds.), *Künstliche Intelligenz in der Bildung* (pp. 3–29). Springer VS. https://doi.org/10.1007/978-3-658-40079-8_1

Yu, L. & Yu, Z. (2023). Qualitative and quantitative analyses of artificial intelligence ethics in education using VOSviewer and CitNetExplorer. *Frontiers in psychology*, 14, 1061778. https://doi.org/10.3389/fpsyg.2023.1061778

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – where are the educators? *International Journal of Educational Technology in Higher Education, 16*(1), 1–27. https://doi.org/10.1186/s41239-019-0171-0

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2020). Einsatzmöglichkeiten Künstlicher Intelligenz in der Hochschulbildung: Ausgewählte Ergebnisse eines Systematic Review. In R. Fürst (Ed.), *AKAD University Edition. Digitale Bildung und Künstliche Intelligenz in Deutschland: Nachhaltige Wettbewerbsfähigkeit und Zukunftsagenda* (pp. 501–517). Springer.

Author's Contributions (CRediT)

AF: Conceptualization, Funding, Supervision, Project administration, Writing – review&editing; CB: Writing – original draft, review&editing, data curation, formal analysis, Methodology; NvE: Conceptualization, Writing – original draft, Project administration, Funding; CT: Investigation, Writing -review&editing; JM: Data curation, Investigation.

All authors have read and agreed to the published version of the manuscript.

Data Availability

Due to the sensitivity of interview transcripts and ethical restrictions, the data is not publicly available. Anonymized excerpts can be made available upon reasonable request.

Ethics and Consent

This study was conducted in accordance with ethical guidelines for research involving human participants. All participants provided informed consent prior to the interviews. Participation was voluntary, and respondents were informed about the purpose of the study, their right to withdraw at any time, and how their data would be used. To ensure confidentiality, all data were anonymized.

Competing Interests

The authors have no competing interests to declare.

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Appendix

Interview guideline (translation)

Introduction	Could you please briefly describe your current role and responsibilities?
Understanding of education	What does "education" mean to you? What does it mean to study successfully, based on your own perspective and experience? Why do people today choose to pursue higher education? How is the university's educational mission or mandate conceptualized, in your view?
AI and Digital Transformation in Higher Education	How would you describe the role of AI in higher education? What can AI realistically contribute to universities and their mission? What are the biggest challenges related to AI, digitalization, and technological change in higher education? Is your university already engaging with AI-based tools? To what extent do you think digitalization and AI influence human behavior and decision-making in academic contexts? How do you see the future of higher education in the next 50 years, especially in relation to AI? How does AI affect personal development and identity formation?
Concepts of Education: Ethical and Societal Implications	Do you think AI and technological change will transform conceptions of education? How do AI systems impact the interaction between the individual, society, and universities from your point of view? Do you think universities have agency in shaping or influencing these technological changes? What are the ethical considerations or risks involved with AI use in higher education?
Vision and Scenarios	What would be your "best-case" scenario regarding AI systems in universities? Conversely, what would be the "worst-case" scenario?
Closing Question	Is there anything else you would like to add about the relationship between AI, education, ethics and universities?

Focus group guide (translation)

Introduction	What does "university" or "higher education institution" mean to you?
Personal Background and Educational Experience	What has your experience been like studying at the university? How would you assess the conditions of your studies so far? Looking back, what do you think could have helped you manage your studies better or more easily?
Conceptions of education	How do you personally define the term "education"? When would you consider someone to be "educated"?
Perspectives on AI in Higher Education	What is your understanding of what AI can or could do for universities? Have you had any experiences with AI? What ethical conditions do you think are important when it comes to AI use? What would be non-negotiable factors that must be in place for you to work with AI systems? What do you think AI should do for people, ideally?
Closing question	Is there anything else you would like to add regarding AI, education, ethics or your experience that we haven't covered yet?