Ethical Guidelines for Artificial Intelligence-Based Learning: A Transnational Study Between China and Finland

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1 Introduction

As artificial intelligence (AI) has been a core technology in national power and global competition, it has received much attention and support from global states (Roll and Wylie 2016). During the past 5 years, both the Chinese and Finnish governments have initiated programmatic policies to promote AI development in society. Thus, AI has not merely been a technological or engineering issue but is profoundly associated with ethics. The Global Technology Governance Report (World Economic Forum 2021) urgently demands ethical guidelines for technology development in the Fourth Industrial Revolution. The World Artificial

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Intelligence Conference held in July 2021 in Shanghai, China organized a forum about "trustworthy AI," which implies a series of ethical considerations in AI technology, such as robustness of algorithm, explicability of analytic results, privacy protection in big data, and equality among different user groups (Tao 2021). As Aizenberg and van den Hoven (2020) argued, machine learning and deep learning in AI concern both the accuracy of technological analytics and serving social justice and human rights. However, the fields of learning and education have not paid sufficient attention to ethical issues when AI technologies are applied. Our study fills a gap in reflections on the ethical guidelines of AI-based learning. Through our transnational comparative research, we propose a human-centered stance for a better understanding of AI in education.

We used China and Finland as two contextual cases to conduct our comparative research. We adopted an inductive analytical approach to review the most relevant and latest policy documents in the past decade that have initiated and facilitated AI within and beyond the educational field. Thus, four major themes in the national policies about AI ethics, both in China and Finland as part of Europe, were distilled: (1) inclusion and personalization, (2) justice and safety, (3) transparency and responsibility, and (4) autonomy and sustainability. Our transnational dialogue has implications for a wide range of audiences, including learners, teachers, AI-technology developers, and policy makers. It provides insights for international research and practice in AI-based learning about how to protect human rights, reduce the risks related to technology, and activate human beings' autonomy and subjectivity in the age of intelligence.

2 AI-Based Learning Needs an Ethical Basis

Recent effective technology and advancements in programming in computer sciences have opened new doors for AI-based teaching and learning (Niemi 2021), and AI has been increasingly adopted into education. It has been widely discussed how AI can increase students' engagement, leading to improved learning outcomes, integrating technologies involving interactivity, dialogue, automated question generation, and learning analytics (Bozkurt et al. 2021). We have much promising evidence from previous studies, for example, showing that AI has already been utilized in predicting students' academic achievement, identifying at-risk students in earlier stages, conducting formative assessment, providing descriptive information about teaching and contributing to teacher development, creating flexible and effective learning tools, and implementing adaptive learning environments (e.g., Almohammadi et al. 2017; Baneres et al. 2019; Baradwaj and Pal 2011; Kay 2012; Vinuesa et al. 2020). In a review study, Goksel and Bozkurt (2019) identified three broad themes in AI-based learning: adaptive learning, personalization, and learning styles; expert systems and intelligent tutoring systems; and AI as a future component of educational processes. While the systematic review on AI-based learning offers

great potential if AI is integrated into the educational process, it also raises open questions to be resolved, such as ethical guidelines on the use of AI-based learning tools.

As aforementioned, there is a lack of literature dealing with the ethics of AI-based learning. Nye (2016) claimed that ethics for data sharing are still being revised to accommodate an increasingly connected educational world. They further stressed that no common ethical guidelines exist for processing educational data and this issue has persisted for years (Coeckelbergh 2020). Recently, Niemi (2020, 2021) stated that, although AI in learning has high potential, it also has many limitations. Many worries are linked to ethical issues, such as biases in algorithms, privacy, transparency, and data ownership. To explain the emergent need for ethical guidelines, Mouta et al. (2019) provided some examples demonstrating the lack of "explainability in terms of educational decisions, for example, relating to students allowance or rejection in entering some educational institutions" and "personalized learning by avoiding the personal right to boredom" (p. 2). Thus, educational systems powered by AI, without accounting for ethical considerations, can be seen as black boxes. Another problem that arises in AI is that data is not immune to bias. AI algorithms are designed by programmers and developed by companies or governments; they can include their own agendas or biases in their development stages (Crawford 2021). Such examples enforce the need to increase research on AI ethics in education.

Some studies have begun on the ethical assessment of AI-based learning by international organizations. In 2019, the Beijing Consensus on AI and Education published its document to offer guidance and recommendations on how global states can respond to the opportunities and challenges brought by AI (UNESCO 2019). The consensus reaffirms a humanistic approach to deploying AI technologies in education for augmenting human intelligence, protecting human rights, and promoting sustainable development through effective human–machine collaboration in life, learning, and work. It also elaborates recommendations corresponding to four crosscutting issues: (1) promoting equitable and inclusive use of AI in education; (2) gender-equitable AI; (3) ensuring ethical, transparent, and auditable use of education data and algorithms; and (4) monitoring, evaluation, and research.

In addition, the European Commission, through the High-Level Expert Group on Artificial Intelligence (HLEG 2019), recently released the ethics guidelines for trustworthy AI, and the European Union Parliament (EP 2020) published the European framework on ethical issues of AI. Both reports emphasize European fundamental values of human dignity, freedom, equality, and solidarity and are based on the principles of democracy and the rule of law. The approach "places the individual at the heart of its activities" (EP 2020, p. 5). When speaking about AI and technology, the moral core is freedom, security, and justice. "Trustworthy AI" can be realized by ensuring that the development, deployment, and use of AI systems meet seven key requirements: (1) human agency and oversight; (2) technical robustness and safety; (3) privacy and data governance; (4) transparency; (5) diversity, nondiscrimination, and fairness; (6) environmental and societal well-being; and (7) accountability (HLEG 2019).

In China, the Ministry of Science and Technology (MST 2019) published the principles of AI governance for the next generation. To promote the healthy development of the new generation of AI, the safety, reliability, and controllability of AI need to be ensured, and all parties involved in the development should follow the principles of harmony, friendship, fairness, and justice. Promoting sustainable development in AI-based learning has eight principles: inclusiveness, sharing, respect for privacy, security, control, shared responsibility, open cooperation, and agile governance.

Nevertheless, more studies are urgently required to provide answers about better living with AI in a learning society and what AI means in education. Most strategies are general, covering all domains in which AI can be applied, and we have several guidelines for AI use that cover different sectors of society. However, the ethical principles for AI in education remain largely unexplored and undiscussed in national and global guidelines. This chapter explores the ethical guidelines for AI-based learning from a transnational approach by comparing the national policies of China and Finland. The Chinese and Finnish governments have each emphasized the significant stance of AI in social and economic development, while education as a unique sector requires special ethical guidelines. A comparative policy analysis on AI-driven education between China and Finland can inspire more countries and areas to recognize and reflect on the ethical issues in AI-based learning.

3 Ethics as a Theoretical Concept

Ethics is a starting point to determine what values we wan to uphold in the development, design, and deployment of AI. The extension, enhancement, and replacement of human agency and reasoning in AI serve as the loci of many of the ethical issues that arise in its use, sometimes presenting us with vivid versions of classical questions (Boddington 2017).

Tegmark (2017) summarized that "Aristotle emphasized virtues, Immanuel Kant emphasized duties, and utilitarianisms emphasized the greatest happiness for the greatest number" (p. 269). There are also deontological theories that emphasize "doing the right thing" and consequentialist theories claiming that the best action is the one that drives the best consequences (Boddington 2017). According to Rawls's ethical theory, justice is the criterion according to which goods and services are distributed among people (Rawls 1999). Rawls used two principles of reasoning to set out and encapsulate his theory of justice. First, "each person is to have an equal right to the most extensive scheme of equal basic liberties compatible with a similar scheme of liberties for others." Second, "social and economic inequalities are to be arranged so that they are both (a) reasonably expected to be to everyone's advantage and (b) attached to positions and offices open to all" (Rawls 1999, p. 53). These two principles raise the questions of how AI can be made available to all so that it does not reinscribe inequality in power, wealth, income, and other resources. Rawlsian philosophy of ethics enlightened for us that AI is not only a public good

to be equally distributed in society but also a means to promote a better society with equity and justice.

Whittaker et al. (2018) noted that "ethics can only help close the AI accountability gap if they are truly built into the processes of AI development and are backed by enforceable mechanisms of responsibility that are accountable to the public interest." (p. 9) Characteristic ethical questions regarding AI are typical enhancements or replacements of human agency; crucially, questions of agency and subjectivity are at the heart of how we see ethics (Biesta 2017). Floridi et al. (2018) reviewed several guidelines for ethically sustainable AI policies that lay the foundations for a "good AI society." They present a synthesis of five ethical principles that should undergird its development and adoption and offer 20 concrete recommendations for national or supranational policy makers and other stakeholders, including beneficence, non-maleficence, autonomy, justice, and explicability, which also serve as a foundation for our discussion of the ethical guidelines in AI-based learning.

In this chapter, we analyze how AI can advance justice and fairness in education and learning and make AI safe for its users. To further focus, our discussion centers on existing policies about how these AI technologies are impacting our lives and reshaping education.

4   Research Design

This chapter is a transnational study of China and Finland as part of the EU. The reason why we chose China and Finland as two contextual cases is that they, respectively, represent an eastern and a western country, a developing and a developed country. Finland plays a double role in the study. It is a nation, but it is also a member state of the EU. Many AI-related issues have been developed in the context of the EU, but Finland also has its own specific national mission. Although many sociocultural differences exist between the two nations, we found the possibility of conducting transnational research due to the similar attention paid by the two governments to AI in learning.

In terms of the collection of policy documents, we separately collected native documents about AI at the national policy level in the past decade (2011–2021). In our analysis, key documents at the official policy-making level were selected (e.g., European Commission 2019, 2020, 2021a, 2021b; Ministry of Economic Affairs and Employment, Finland 2017, 2019; Ministry of Education, China 2020; State Council, China 2021). All policy documents were downloaded or could be fully accessed online.

Then, we used the thematic analysis method (Flick 2006) to distill the major themes about AI ethics amidst the policy documents. The ethical issues have not been particularly clearly answered for the education field, but the governments have been aware of the importance or implied directions for ethical reflections on AI-based learning. Thus, we tried to dig out the ethical principles hidden in

political discourses. Finally, we built four pillars for a trustworthy AI ecosystem for achieving a more equal and democratic education system, which involves (1) inclusion and personalization, (2) justice and safety, (3) transparency and responsibility, and (4) autonomy and sustainability.

The credibility and reliability of our analysis was achieved by constant comparison and triangulation checking between the two authors. Additionally, as international experts in the fields of education and AI-based education, our professional vision on the ethical guidelines for AI in learning can also be regarded as a Delphi demonstration. Nevertheless, more perspectives from other sociocultural contexts are required in further research.

5   Chinese and Finnish Contexts

In this section, we briefly introduce the contexts of China and Finland and the national-level policies related to AI-based learning within and beyond the education sectors during the past decade, both in the two countries.

5.1   AI in Learning and Education in the Chinese Context

China is a developing country located in the east of Asia. Since the 2010s, Chinese national policies related to AI and the subsidiary principles of national decision-making in education have been much produced and issued. In March 2017, Prime Minister Keqiang Li mentioned that AI technology should be researched and developed rapidly. The goal is that, by 2030, China's AI technology and application should reach a leading level globally (State Council, China 2017).

In this context, the Ministry of Education (MOE 2020a) has attached great importance to the improvement in teachers' and students' digital literacy by employing AI in learning and education to build high-quality education systems. As AI has been a core technology in education reform and innovation, it has received much attention and support from the Chinese government. During the past 5 years, the Chinese government has initiated several policies to push AI development in teacher training, student learning, and schooling. However, the ethical principles of AI in education at China's national level are not very clear, which needs to be constructed for further analysis of the policy documents of the future.

5.2   AI in Learning and Education in the Finnish Context

Finland is a member state in the EU and has been in active interaction with the working groups preparing documents for AI. In addition, according to the Ministry

of Economic Affairs and Employment (MEAE 2017), it has also been a forerunner in Europe, publishing its national AI strategy as the first in the EU, and updated in 2019 (MEAE 2019). Before that, Finland had several national digitization programs since the 1990s, promoting digital competences to all people and specific programs for schools and teacher education (e.g., Niemi et al. 2014). The most important value has been equity, which means supporting everyone in using their equal rights. This value is also a leading principle in AI strategies.

Ethical principles have been discussed at the EU level in several documents (e.g., European Commission 2020, 2021a, b; European Parliament 2020; HLEG 2019). In 2021, the Commission published a proposal for a regulation of the European parliament and that of the council for harmonizing rules on AI. This approach is applicable to the entire AI development, not specifically for education. The EU is established for economic and social purposes. Therefore, the recommendations for AI are mainly related to business, technology, and commerce. The EU sees AI as a powerful tool for innovation and productivity. However, AI is also seen for social development, covering a wide spectrum of efforts to promote inclusion, tolerance, justice, solidarity, and nondiscrimination based on the EU's fundamental values of democracy, human dignity and freedom, and human rights. Education and its regulations are beyond the EU mandate and are each nation's own responsibility. However, the EU can provide recommendations and guidelines for advancing educational actions for the well-being of society and citizens.

6 Ethical Guidelines for AI-Based Learning

In this section, we introduce the national-level policies related to AI-based learning within and beyond the education sectors during the past decade, both in China and Finland. We focus on the aforementioned themes: (1) inclusion and personalization, (2) justice and safety, (3) transparency and responsibility, and (4) autonomy and sustainability.

6.1 Inclusion and Personalization

When AI permeates learning and education, it first concerns equal access by all learners. Meanwhile, AI should supply learners with differentiated alternatives in education. In China and Finland, there are different contents and strategies for promoting the inclusion and personalization of AI in learning.

6.1.1 Chinese Context

In China, AI has been regarded as a tool to achieve personalized and differentiated learning through cultivating qualified teachers who have the ability to use AI in teaching. China's MOE (2018a) issued the "action plan for revitalization of teacher education," which encourages full use of cloud computing, big data, virtual reality, and AI to promote information-based teaching. Moreover, China's MOE (2020b) issued a policy about reforming teacher training programs in rural areas. By integrating 5G and AI into the teacher education curriculum, it optimizes pre-service teachers' capability of digitized teaching. These policies focus on integrating AI into teacher education and then suggest that the teacher is a primary agent who ensures AI ethics in education.

Considering the disparate development of the east and west regions of China, AI has become an effective technology to support disadvantaged and vulnerable groups in access to high-quality education resources. One example is building an intelligent schooling platform, where students' learning can be recorded and diagnosed accurately. In terms of personalized learning, China's MOE has planned future tasks to strengthen the construction of the platform for educational resources, especially to achieve balanced development of urban and rural schools with the help of AI (MOE 2018b).

6.1.2 Finnish Context

Inclusion is a leading principle throughout the Finnish educational system, and equity has been the highest priority over 40 years (e.g., Niemi et al. 2016). Equity and inclusion have also been a core in all national digitization programs since the 1990s. At present, AI provides new tools for supporting students' learning and keeping all students active in their learning paths. Personalization has already been included in the national core curricula 2014 for basic education, and now AI will provide new tools to pursue that aim. So far, the main ethical considerations in AI strategies have focused on equal opportunities for life-course learning.

Both in European and Finnish national AI strategy documents, AI's connection with education originates primarily from working life's perspectives and how work will change radically with AI. Lifelong learning and people's capacity to understand and use AI in their lives are central concerns. The focus is on people's capacity to use digital tools in their daily life: "all Europeans need digital skills to study, work, communicate, access online public services and find trustworthy information" (EC 2021b). The Finnish AI strategy (MEAE 2019) also states that, in lifelong learning, society should meet substantial continuing education needs. This aim requires reforms in the education system and the division of responsibilities arising from the updating of professional skills, and "AI and digitalization should be extensively incorporated into a broad range of different educational programs" (MEAE 2019, p. 13).

The Ministry of Education and Culture (MEC 2020) in Finland sees AI's connection to education as wider than only lifelong learning. The MEC published 2020 education policy foresight until 2040, which set the aims that "new methods introduced by science and AI can be utilized in many ways in the guidance and evaluation of the entire education and research system" (p. 83). In addition to system-level data, AI can help identify and eliminate learning problems. Inclusion can be achieved by evaluating how the system and educational services work and how to help individual students. AI can promote inclusion and support learners through personalization, but it should be integrated with other services, and the development must be based on contributions from many partners. However, the report also warns that "data utilization also has its inherent risks in the absence of clear ethical, legislative, and data management guidelines, in the development of which the public administration plays a major role" (MEC 2020, p. 83).

6.2 *Justice and Safety*

Justice and safety means that people can trust AI solutions and have the skills and procedures required to influence AI use and AI-based decisions. Meanwhile, in this process, personal data and our privacy will be protected. Both China and Finland have been aware of the challenges of AI in learning when it comes to algorithmic unfairness and risks.

6.2.1 Chinese Context

In 2016, China National Commission of Development and Reform (NCDR 2016) issued the "3-year action plan for Internet + AI," which proposed cultivating many global leading AI backbone enterprises in key fields, initially to build a solid foundation, active innovation, open cooperation, green and safe AI ecology, and a 100-billion scale of AI market application. In terms of education, AI is primarily regarded as an ought-to-be safe technology for all children.

In 2017, one document entitled "development plan of new generation AI" issued by the State Council, China, stated that AI has become a new engine of social development. On one hand, AI has brought new opportunities; on the other hand, its development has also brought some uncertainties and new challenges (State Council, China 2017). One of the major challenges is network security. China's MOE discussed this issue in 2019, stating that educators should be aware of the potential security risks in big data. Schools and teachers should strengthen forward-looking prevention and minimize the possible risks in some AI platforms and ensure the safety, controllability, and reliability of AI in education (MOE 2019).

6.2.2 Finnish Context

The EU has expressed very strongly that "AI systems must not undermine democratic processes, human deliberation, or democratic voting systems" nor "the foundational commitments upon which the rule of law is founded" (European Commission 2019, p. 11). The Finnish AI strategy reinforces that approach and claims that, in Finland and Europe, AI-related systems and use must respect the principles of Western democracy and freedom and AI should be seen as "a way of reinventing society and increasing citizens' participation in decision-making and democratic processes" (pp. 38–39).

As an indicator of justice, the EU has enacted in 2018 (regulation already accepted in 2016), the General Data Protection Regulation (GDPR), which applies across the EU (EC 2018). The GDPR sets out principles for the lawful processing of personal data. Personal data are any information that is related to an identified or identifiable natural person. The GDPR's primary aim is to enhance individuals' control and rights over their personal data.

The purpose of the GDPR is to provide a set of standardized data protection laws across all member countries. It covers all phases of collecting, using, and storing data. This should make it easier for EU citizens to understand how their data are being used and raise any complaints. Finland is also committed to following this regulation. Schools and educational institutions must follow GDPR principles and have organizational and technical measures and policies in place to keep personal data safe and secure. GDPR sets high demands for data collection and restoration with AI-based applications. It must be applied, for example, with big data and learning analytics when being used for profiling students or when schools use other AI-based tools, such as massive online courses or intelligent tutoring systems that collect data from students. All data collections must be accurate and require permission from a person. A consent must be a specific, freely given, plainly worded, and unambiguous affirmation given by the data subject, and data subjects must be allowed to withdraw this consent at any time. Consent for children, defined in the regulation as being less than 16 years old, must be given by the child's parent or custodian and should be verifiable. Schools should also ensure that external organizations from whom they have contracts (e.g., AI services) meet the GDPR requirements. The aim of the GDPR is to ensure the right for safety and privacy to citizens in the use and contexts of AI.

6.3 Transparency and Responsibility

Another two ethical questions that need to be addressed are how a decision is made and who is responsible or accountable in AI-based learning. These questions relate to issues of transparency and responsibility. Both educators and learners should be able to see and understand how the algorithmic process works and what possible results can be achieved.

6.3.1 Chinese Context

The State Council, China (2016) published the national plan for technology innovation in the 13th Five-Year Plan. To build a modern industrial technology system with international competitiveness, it is proposed to vigorously develop a new generation of information technology with ubiquitous integration, green broadband, security, and intelligence; develop a new generation of Internet technology; ensure the security of cyberspace; and promote the wide penetration and deep integration of information technology into various industries. In this ambition, accountability is about a clear acknowledgement and assumption of responsibility and answerability for actions, decisions, products, and policies in the national plan.

In the 2018 forum of AI standardization, the white paper of AI standardization was published, which makes AI technology more transparent within social audibility (AI Standardization Commission 2018). Recently, the China Ministry of Science and Technology (MST 2021) published the regulations of new generation AI ethics, which emphasized the data transparency and audible outcomes of AI technology.

In 2021, the China MOE actively explored the use of AI technology to enhance interactive communication, intelligent question answering, and personalized learning resources to push the functions of platforms at all levels. The China MOE encouraged K-12 schools to strengthen the collection and analysis of students' learning data and information through AI platforms (MOE 2021a). The prior action is to educate teachers and students to know the algorithmic process of AI platforms in schooling so that teachers can carry out concise guidance for students. It can be seen as the responsibility of AI in education when learners get enrolled in the technological environment. Educators also have the responsibility to create a learning environment with a sense of safety.

6.3.2 Finnish Context

The European Commission has opted for a human-centric approach, meaning that AI applications must comply with the fundamental rights of European citizens. At this moment, the focus in the AI debate in Finland and elsewhere in Europe is on ethical issues: "protection of privacy, accountability for the errors made by AI systems, and the traceability and transparency of algorithm-based decision-making" (EC 2020, p. 35).

In terms of transparency and responsibility, the GDPR provides a general framework and contains specific obligations and rights for the processing of personal data (e.g., the right not to be subjected to solely automated decision-making, except in certain situations). It also includes specific transparency requirements on the use of automated decision-making (e.g., to inform about the existence of such decisions) to provide meaningful information and explain its significance and the envisaged consequences of the processing for the individual (EC 2018, 2020).

The Finnish AI strategy (MEAE 2019, p. 106) critically observes that one ethical challenge is that AI is produced in ecosystems and ensuring compliance with ethical

practices can seldom be controlled by an individual organization. Services with the help of AI applications require complex global value chains. The report also claims that we need multidisciplinary discussion and research data to understand and interpret the broad societal impacts of AI. It also emphasizes that AI ethics must not be seen as a factor posing limitations on the activities only but also as a factor that creates something new and provides increasing opportunities (p. 106).

6.4   Autonomy and Sustainability

Although AI technologies are still a work in progress, it is not inconceivable that such AI machines, assuming other outward forms, will interact with humans holistically in the future. Autonomy and sustainability concern the ethical considerations of human–AI relations.

6.4.1   Chinese Context

Deep learning and machine learning are the core concepts for AI in educational data mining. Due to the significant progress in theory and practice derived from the application of AI in educational data mining and learning analytics, it is further argued that learners' autonomy in the AI-based learning environment has become increasingly important.

China MST (2021) issued the new ethical regulations of AI, which implies a prudent consideration of human–AI relations. In the learning and educational field, AI has increased the effectiveness of teaching and decreased teachers' workload (e.g., homework checking). However, it is another issue to preserve educators' and learners' autonomy, which means that some humans' abilities cannot be replaced by AI (e.g., socio-emotional literacy and agentive decision-making) (MOE 2021b).

In terms of the sustainability of human development using AI, the China MOE declared to promote the teaching contingent by AI, which explores new ways through AI to promote teacher management, educational innovation, and accurately helping the alleviation of poverty (MOE 2018b). Similarly, in April 2021, China MOE (2021c) proclaimed to make full use of the advantages of AI to cultivate highly qualified teachers with new pedagogical ideas. In China, the sustainable development of education starts with an excellent teacher contingent. If AI serves as a tool for constructing a high-quality education system, then it means that education would gain sustaining development.

6.4.2   Finnish Context

Autonomy "is a quality that can be attributed only to human beings. It is expressed in the human abilities to be self-aware, self-conscious, and a self-author, meaning

being able to set own rules and standards and choose own goals and purposes in life. Autonomy is a central aspect of human dignity and agency" (EP 2020, p. 12). There is ongoing discussion on the explicability of algorithms. Although deep learning has the so-called black boxes that are difficult to explain, human beings are still responsible for the decisions made by AI and consequences in society. Therefore, respect for human autonomy requires that there is meaningful human intervention and participation in AI and that AI systems are not to "subordinate, coerce, deceive, manipulate, condition, or herd humans" (HLEG 2019, p. 12; EP 2020, p. 52).

AI provides multichannel and multimodal data collection. Big data has the capability to combine data from different sources, to segment, and to profile students. In education, digital traces start from early childhood throughout the course of life. Finland has clear thought leadership in the development of the principles, operating models, information architectures, and technical solutions of a human-centered data economy (MEAE 2019, pp. 58–60). Here, the MyData approach also plays a key role. The model is derived from healthcare, and the most essential part of MyData is the consent for the use of patients' data and the safe transfer of information. In an international comparison, the Finnish MyData work is advanced because of the development of interoperability between operators and data ecosystems functioning in a fair manner. The European Commission has highlighted it as part of the preparation work for its data economy communication (MEAE 2019, p. 60). This type of MyData can also be useful in the education sector.

The Finnish strategy (MEAE 2019) makes critical remarks and indicates that the recent debate is very expert centric and claims that civil society should be allowed to participate in the discussion about AI ethics and its societal impacts to an increasing extent. AI-based solutions should be seen as a way of reinventing society and increasing citizens' participation in decision-making and democratic processes. For a sustainable use of AI, the Finnish strategies set as the future aim that everyone has sufficient understanding of AI and has this as a new civic skill. The strategies propose interdisciplinary, long-term research on the interaction of AI and society, supporting the autonomy of research and the critical voice (MEAE 2019). This sets new demands for the entire education system.

7 Discussion and Conclusions

Achieving the global benefits of AI requires transnational dialogues on many areas of governance and ethical standards while allowing for diverse cultural perspectives and priorities. This chapter is an endeavor to reimagine our learning and education, by exploring a global contract about AI ethics (UNESCO 2021). In the final section, we discuss the commonalities and differences in AI ethics between China and Finland. The results of our analyses of Chinese and Finnish policies of AI in learning and education can provide insights into constructing AI ethics in education internationally.

Table 1 Differences in AI ethics in education between China and Finland

		China	Finland
Approaches		Top-down initiatives Governments direct and guide	Bottom-up explorations The third parties and professional and expert organizations involved
Properties		Most of the policies are regulations AI ethics in education depend on other social sectors	Some policies have been legitimated AI ethics in education are unique but need interaction with other sectors and stakeholders
Strategies	*Inclusion and personalization*	Teacher education as a focus AI-based schooling has been explored	Lifelong learning as a focus Informal education sectors are included
	Justice and safety	Data safety and data protection are emphasized Forward-looking ability to prevent risks Personal data protection relates to social harmony	Human-centered approach to all AI-based activities Strong claims of personal data protection and privacy Human dignity and freedom, human rights, and democracy as AI grounds
	Transparency and responsibility	Make the algorithmic process public to learners Building audible AI platforms for learning outcomes	All stakeholders have responsibilities of transparency Specific requirements for the whole process of decision-making
	Autonomy and sustainability	Learners have irreplaceable subjectivity Teacher-driven reform is a vital step in AI's sustainable development	Autonomy is a quality that can be attributed only to human beings AI knowledge as a civic skill

In terms of the differences in expressing ethical principles in AI-based learning, Table 1 depicts the variations from three aspects (i.e., policy approaches, properties, and strategies), which can work as a theoretical framework for further comparative studies among other countries and regions.

Due to the differences between the sociocultural context and political regime, China mainly takes a top-down approach to initiate AI ethics. In contrast, Finland, as part of Europe, has more third parties and professional communities to contribute to the exploration of AI ethics in education. Interestingly, in Finland, some policies about AI ethics are legislations approved by local governments or the EU. Yet, Chinese policies about AI ethics in education depend much on other social sectors'

coordination. In terms of the specific strategies, Finland has a strong emphasis on the value basis of equity, nondiscrimination, human rights, and democracy and how all citizens can be made capable of using AI in their lives. Influenced by the Western value of citizenship, Finland emphasizes that all people should be able to understand the basics of AI and how it influences their lives and give their consent for the safe use of their personal data. China, as a communist country, pays much more attention to cross-sectional cooperation between education and other social sectors in developing AI and a shared ethical basis in a harmonious society.

Despite the differences, in this chapter, we call for a human-centered or humanist stance upon AI. Through our comparative research between China and Finland, the deployment of AI technologies in learning should be proposed to enhance human capacities and to protect human rights for effective human–machine collaboration in life, learning in and out of formal sectors, and lifelong sustainable development. In terms of inclusion, justice, and equity, the promise of "AI for all" (UNESCO 2020) must be that everyone can take advantage of the technological revolution underway and access its fruits, notably in terms of innovation and knowledge.

It is not difficult to conclude that both China and Finland assume that AI has the potential to address some of the challenges in education today, to innovate teaching and learning practices and, ultimately, to accelerate progress toward sustainable development goals (United Nations 2020). As two of the earliest nations proclaiming digital national programs, China and Finland are active partners in international discussions on the ethical principles of AI in society. All national strategies in the two countries for AI have a long-term view on social development. However, as noted in the beginning of this chapter, both countries hold the perspective of tending to industry and business for international competitiveness, not much specifically on education. This finding implies that educational sectors should not simply be the customers of AI technologies but should maintain relative independence or even lead the change in AI. This transnational study suggests that we should be aware of the uniqueness of learning and education compared to industry and business, which needs localized ethical guidelines for AI-based learning in the future.

Bridging these socio-technical gaps and the deep divide between the abstract value language and design requirements is essential to facilitate nuanced, context-dependent design choices that can support moral and social values (Aizenberg and van den Hoven 2020). In addition, we need more ethical reflections for education and learning at different levels: (1) society-level impacts and consequences on justice, equality, and inequality; (2) ethical guidelines for technological developers' and users' for making intelligent tools safe and explicable; and (3) ensure individuals' capacity and rights when using AI. By benefiting from AI technologies alongside ethical guidelines, we can reimagine a better future in which teaching and learning can shape the future of humanity and the world.

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