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Redefining the Role of Educators in an Artificial Intelligence (AI)-Enriched Educational Landscape – a project proposal

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Abstract

The influence of artificial intelligence (AI) and its disruptive impact on education requires a critical rethink of traditional roles and practices. Education 5.0, as the future of education, bridges educational technology innovations and human-centred approaches that harmonise intelligent teaching and stakeholder well-being. In addition to technical skills, teaching in Education 5.0 means considering academic integrity, fair and trustworthy assessment, data protection, applying a comprehensive ethical approach and developing soft skills. The main characteristics of tomorrow's students and AI technology influence the reform of the role of educators. This abstract outlines a proposal for the redefinition of the role of educators in the form of an international project. As the redefinition journey due to AI innovations has a dynamic character, this proposal activates a trend radar and actively includes stakeholders in the form of international focus group sessions throughout the project to embrace the current regulations and policies on the one hand and practical implementations on the other. It includes the active participation of educators as the main target group and invites students and education experts. Having an international perspective, an educator-student-expert point of view and current regulations in the background, this project will result in continuous professional development possibilities for all stakeholders, a redefined role of educators and loops of reflection. The proposal builds upon a finished international Erasmus+ Project that aimed to enhance the digital competencies of educators. As AI is overwhelming the educational practice, the redefinition of teaching practices and the role of educators is crucial to navigating the future of education.

Keywords: Education 5.0, AI in education, academic change, continuous professional development

1. Introduction

The super-smart society, Society 5.0, tends to harmonise the major challenges of technology, sustainability and user-friendly functionality in all areas of life, focusing on human well-being (H-UTokyo Lab, 2020). Society 5.0 was first established by the Japanese government in 2016, and the idea is gradually being disseminated as a future approach to a new way of living. The great challenge lies in the perspective of synergy and interdisciplinarity of the different aspects. Where one element creates a user-friendly approach, it could manifest a lasting imbalance in other applications.

Taking the model of Society 5.0 as a comprehensive and multi-structured, from a rescaled perspective, we can understand Education 5.0, which is facing analogous changes. Education 5.0, as an inseparable component of Society 5.0, needs to adapt to a human-centred approach. The challenges in education can be manifested by applying new technologies without considering the black box performance of the artificial intelligence (U.S. Department of Education, 2023) or taking for granted the results developed by artificial intelligence systems without considering possible algorithmic biases (European Commission, 2022) and without putting the 'teacher in the loop' (Vuorikari et al. 2020).

The idea behind Education 5.0 is to navigate the current digital transformation and green transitions, thereby strengthening the social role of university activities (Carayannis & Morawska, 2023). This means that educators, as the main actors in education, need to redefine the perspective of the traditional role and adapt to the requirements of Education 5.0 (Krebs et al., 2023).

Embracing the published guidelines and frameworks on Artificial Intelligence in Education, on international and national levels, for example ‚Ethical Guidelines on the use of artificial intelligence (AI) and data in teaching and learning for Educators' (European Commission, 2022), ‚Artificial Intelligence and the Future of Teaching and Learning' (U.S. Department of Education, 2023), ‚Australian Framework for Generative Artificial Intelligence (AI) In Schools' (Commonwealth of Australia, 2023), this work places a particular focus on the education, specifically on the role and responsibilities of educators. The goal of Education 5.0, to create an environment where all elements interact in a synergistic, balanced, coordinated and human-centred way, presents a new challenge for all stakeholders in education. Having educators in the focus, we design a proposal for the redefinition of the role of educators in the form of an international project. The project embraces the international perspective of educators, students and education experts and forces, on the one hand, a practical exchange in focus groups, and on the other hand, the project activates a trend radar that follows new standards, guidelines, regulations and implementations.

2. The context

This work focuses on the key elements in the future of education – students, educators, and technology. By considering the student population and the growing incorporation of technology in university ecosystems, we aim to explore the educators' role in balancing

technological advances and facilitating student learning with a human-centred approach (European Commission, 2022; U.S. Department of Education, 2023).

2.1 Students

The demographic of students is changing in terms of age, gender, economic background, ethnicity, and generational status (Pelletier et al., 2024). This forms a significant cohort of non-traditional students with diverse social, family and educational backgrounds. These students are often older and usually have work experience, and their life situations differ from traditional school leavers, which brings different perspectives and motivations to their studies (Gilardi & Guglielmetti, 2011). The growing diversity of the student population positively influences university campuses and improves the social and ethnic dimensions (Nam et al., 2024). Interacting with individuals from various cultures and backgrounds enriches students' learning experience, which has a positive impact on their careers after graduation (Nam et al., 2024).

Given these findings, the universities will need to review current approaches, existing offerings and their compatibility with the labour market trends, will need to prepare the ecosystem to be more pedagogically adaptable and affordable for the diversity of the population, will need to implement alternative credentials, adapt support services and find meaningful strategies for creating a sense of belonging and well-being for all students (Pelletier et al., 2024). Recent research (Garrett et al., 2023) reports an increase in student demand for online and hybrid learning and a decrease in demand for face-to-face courses on the other side. These findings encourage institutions to realign their strategic priorities accordingly (Garrett et al., 2023).

On the other hand, a new generation of students, Generation Alpha will shape the future. Therefore, some of the general characteristics of this generation need to be considered. Ziatdinov & Cilliers, 2022 in their research state that Generation Alpha, born after 2010, is growing up in a technology-driven world and is characterised by an entrepreneurial spirit, progressiveness, and high expectations of higher education. The study noted that their learning styles are heavily influenced by early exposure to digital tools, interactive content, and online platforms, requiring educators to adapt teaching methods accordingly. This generation values social connections and is proficient in navigating digital environments, which universities should consider in their curriculum design. As Generation Alpha enters higher education, institutions face both challenges and opportunities in using technology to enhance the learning experience and meet the specific needs and expectations of this new cohort (Ziatdinov & Cilliers, 2022).

2.2 Technology

We will examine Artificial Intelligence in the educational landscape through three key approaches relevant to this project: thematic considerations of AI implementation in education (usage types), its impact on the teaching and learning processes, and the associated competencies.

The literature offers different categorisations of how the technology, and in this specific case, the use of AI systems can enhance the educational landscape. In the systematic review of Artificial Intelligence in Education (AIEd), Crompton & Burke, 2023 identify five usage types: assessment/evaluation, predicting, AI assistant, intelligent tutoring system, and managing student learning. Nevertheless, a differently structured categorisation found in other materials (‘Introduction to AI’, 2023) provides the following systematisation: adaptive assessment and feedback systems, intelligent content generation, natural language processing (NLP) and language-based interaction, and personalised learning with AI. For this proposal, we combine the elements and structure as follows: adaptive assessment and feedback systems, intelligent content generation, AI interaction and assistance, personalised learning with AI, and prediction.

Artificial intelligence (AI)-powered adaptive assessment and feedback systems are being applied in various ways, including automated assignment and quiz evaluations, adaptive testing tailored to learners' proficiency, and intelligent feedback systems that provide targeted suggestions for improvement, along with automated grading systems (Crompton & Burke, 2023; 'Introduction to AI', 2023).

AI-based intelligent content generation draws from multiple sources to automatically create learning materials, interactive elements, and immersive environments in various formats, enriching the learning experience ('Introduction to AI', 2023).

AI interaction and assistance include chatbots, voice-activated features, text-to-speech capabilities that convert written text into spoken language, and translation functions, all designed to support learners (Crompton & Burke, 2023; 'Introduction to AI', 2023).

AI enables personalised learning through adaptive learning paths that adjust content difficulty and pacing based on learners' digital body language, results achieved, preferences, and interactions ('Introduction to AI', 2023; Crompton & Burke, 2023).

AI-driven prediction involves analysing a variety of learning and sensitive data to forecast students' academic performance, such as identifying those at risk of failure, predicting dropout likelihood, or estimating future academic success (Crompton & Burke, 2023).

The potential applications of AI in education, focusing on its impact (Pelletier et al., 2024), are recognised in six key technologies and practices: finding appropriate uses for AI-enabled technology, supporting AI fluency, supporting equitable and inclusive learning, protecting data privacy and security, navigating misinformation and supporting mental health (Pelletier et al., 2024).

Finding appropriate uses for AI-enabled technology involves identifying ethical and effective ways to integrate artificial intelligence into teaching and learning. Educators must consider how AI tools can enhance student engagement, personalise learning experiences, and improve educational outcomes while addressing potential biases and privacy concerns (Pelletier et al., 2024).

Supporting AI fluency helps stakeholders - students, faculty and administrators - to understand and use AI tools responsibly. This includes developing AI literacy, understanding

algorithmic decision-making, and promoting critical thinking about the impact of AI on society (Pelletier et al., 2024).

We also need to support equitable and inclusive learning, which means fairness and inclusivity in educational practices. Educators should use AI to reduce disparities, address accessibility challenges, and create learning environments that meet the diverse needs of students (Pelletier et al., 2024).

Protecting data privacy and security is one of the biggest challenges, as well as navigating misinformation. Educators must be aware of privacy regulations, implement secure data practices, educate students about data protection and develop skills to identify and neutralise false information. AI can assist in fact-checking, but educators should also teach students media literacy and critical evaluation of online content (Pelletier et al., 2024).

Lastly, supporting mental health should be equally included. The educators need to be aware of the mental challenges that the students are facing and be competent to implement technologies and practices that enhance mental well-being. AI-driven tools can provide early intervention, personalised support, and resources for students' emotional health (Pelletier et al., 2024).

In the context of examining teachers' competencies in digital technology, data and artificial intelligence, the 'AI Report' (Le Borgne et al., 2024) distinguishes three categories related to teaching for, with and about AI. Teaching for AI involves imparting competencies essential for all citizens, including educators and learners, to engage confidently, critically, and safely with AI systems, equipping them with the essential knowledge, skills, and attitudes needed to thrive in a world shaped by AI. Teaching with AI prioritises the use of AI systems to achieve educational objectives, requiring pedagogical judgement regarding their application, as well as a comprehensive understanding of underlying algorithms, pedagogical models, and data. Finally, teaching about AI addresses the technical aspects, concentrating on instructing students in the foundational principles of AI, typically encompassing AI literacy integrating both technological and human dimensions of AI, tailored to students' age groups. In this project, we include two aspects: teaching with and for AI (Le Borgne et al., 2024).

In the continuous, we focus on educators. As one of the main members in the university setting, educators are faced with the inevitable necessity for a rethinking of their role. The influence of technology, precisely artificial intelligence is in constant growth. To embrace the changes, the educator of tomorrow is resilient and aware of the power of technology and the risks that it brings.

The next chapter presents an international project proposal in which we create components for a collaborative and interactive path for redefinition of their role.

3. Project proposal for redefinition of the role of educators

3.1 About the project

Recognising the rapid advancements in AI and the lack of comprehensive guidelines, this project aims to raise awareness of AI in education. At its core, the project underlines the need for trustworthy artificial intelligence (HLEG AI, 2019) within an educational framework and promotes critical and ethical conversations about technology advances among educators. By adopting an interdisciplinary approach, the project assembles a well-defined model for Educator 5.0, illustrates the application areas of AI with a use case map, creates training for educators and students within the AI Academy for the identified gaps between the current and desired role of the educator (Educator 5.0), includes educators and students in active discussions and reflection loops encouraging them in the implementation and supporting the educators in performing the new role.

3.2 Background

Our project was inspired by the pressing requirement to prepare educators with the necessary skills to efficiently navigate the rapidly changing landscape of education enhanced by artificial intelligence (Krebs et al., 2023).

A significant influence in shaping this project was the 'Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for educators', issued by the European Commission in 2022. These guidelines, detailing four use cases – student teaching, student supporting, teacher supporting, and system supporting (European Commission, 2022) – demonstrate specific educational instances, underline key trustworthiness requirements, and provide a robust foundation for creating our work packages.

Our previous Erasmus+ project, Enhancing the Development of Digital Competencies of Educators – EDUdig, 2021-2023, involved creating resources to promote the digital competencies of educators. At that point, generative AI was just in the beginning to make a substantial impact. Since our project timeline and packages were set and most of them were almost complete, we couldn't have addressed this new technology. Recognising this as a natural progression, we see the need to extend this project to develop additional resources. We aim to enable both educators and students to acquire new skills and experiences in an environment enriched by AI.

3.3 Objectives of the project

The primary objective of this project is to redefine the role of educators, preparing them for teaching in an AI-enhanced environment. As we push the boundaries of current practices, we seek to equip tomorrow's educators with essential competencies.

Considering the usage types of AI implementations in education, their impact on teaching and learning processes, and the competencies, as stated in the subchapter Technology of this article, we welcome an ethical, human-centred approach (European Commission, 2022; U.S. Department of Education, 2023; Australian Commonwealth, 2023; Le Borgne et al., 2024,) over a purely technical perspective. Using this approach, we aim to raise AI awareness in

education, encourage critical thinking on AI use, reorient educators' roles and their sense of responsibility, and foster collaboration among educators. This shift would pave the way for a transformation of educators' roles and their sense of responsibility, particularly emphasising the 'teacher in the loop' (Vuorikari et al., 2020) aspects.

3.4 Literature review

Our methodology for reviewing and selecting literature for the project proposal followed a systematic approach based on several key criteria: subject matter, presence of keywords in the title, publisher, language and year of publication.

We selected the sources whose subject matter centred on the application of artificial intelligence in education, particularly its implications on the role of educators. This focus ensured that our selection was geared towards directly applicable and relevant sources for our project.

The keywords in the title, namely 'guide', 'guidelines', 'report', 'insights', 'recommendations', 'compendium', and 'considerations', greatly influenced our selection. This approach ensured that the chosen works addressed exploratory and transformative aspects rather than individual empirical discussions or case studies.

We conducted the selection on a macro level, weighing the reputability of publishers. We chose the sources from influential and research-driven institutions such as the European Commission, UNICEF, the US Department of Education, the Commonwealth of Australia.

Only documents written in English were selected, ensuring that the material was accessible and understandable for the entire project team.

Lastly, we prioritized works from recent years (2022-2024). In specific cases, significant literature from 2020 was also included, which helped us to ensure that our project incorporated the most up-to-date affairs, insights, trends, and developments in the field.

3.5 Design and Methodology

To ensure high-quality outcomes, a diverse group of educators, students, experts and higher education representatives will be involved in the development process of Educator 5.0.

The project begins with the implementation of a 'trend radar' that tracks all emerging guidelines, regulations, and relevant literature throughout the project's lifetime. The trend radar embraces the literature review as indicated in the previous subchapter and extends the year to match the project cycle.

The first steps in the project involve collecting and mapping the use cases. Simultaneously, we initiate focus groups with the target group — educators. Here, we value direct exchange to gain insight into educators' practices, experiences, and opinions. We use the ‘Ethical guidelines on the use of artificial intelligence (AI) and data in teaching and learning for educators’ (European Commission, 2022) as a supporting framework to identify these use cases and to reflect on future areas of application, as well as the five usage types - adaptive assessment and feedback systems, intelligent content generation, AI interaction and assistance, personalised learning with AI and prediction, as thematically adapted types based

on Crompton & Burke, 2023 and 'Introduction to AI', 2023, - aiming to develop a holistic representation of relevant use cases of AI technology in higher education teaching and learning. These use cases form the foundation for the role transformation. This aspect compares the traditional and new roles of educators, particularly in AI-enhanced teaching settings. It identifies how the new role should manifest, its growth opportunities, novel tasks and responsibilities, skills to obtain, and fresh perspectives to establish. This process parallels with the trend radar and engages educators through focus groups. The role of educators often differs based on factors such as their workplace, department, country, or specific area of expertise. The role transformation is based on the participating educators of the international consortium, affirming that the role model aligns with their realities.

Subsequently, we will create and launch an AI Academy with two concurrent tracks for educators and students. This academy will comprise courses and workshops that address the latest trends and regulations regarding AI in education, addressing the impact of AI on teaching and learning processes, including AI fluency, with a strong emphasis on ethics, inclusion, well-being, data protection, and responsible use. Participation in the AI Academy will enable educators to connect and exchange practices on the international level with educators from partner organisations.

The courses for educators will focus specifically on competencies and will be designed to cover key topics essential for the successful integration of AI tools into teaching practices, addressing two competency aspects: teaching for AI and teaching with AI (Le Borgne et al., 2024). Teaching for AI includes the competence that empowers educators and students to interact confidently, critically, and safely with the AI environment from the user's perspective and does not explore the developer's perspective. On the other hand, teaching with AI explains how to use AI systems and tools for educational purposes.

Summarising all the findings, we create reflection loops in which we engage educators, higher education experts and students to reflect on the process of implementing AI in teaching and learning practices to foster understanding and acceptance among educators and students through collective reflection. We understand that role transformation is not a one-time event but a continuous professional development. The reflection loops facilitate the dynamic shaping of the Educator 5.0 role model, support educators in taking action and enable stakeholders to discuss the opportunities, limitations, challenges and benefits of using AI in higher education.

3.6 Preliminary implications

The research presents several preliminary implications for AI integration in teaching and learning environments.

Facing new challenges in an AI-enriched educational landscape, educators need to make instantaneous decisions while also having a deep understanding of the processes in which AI is involved. The impact of AI extends beyond content generation to systems that support educational ecosystems, directly influencing student success in candidate selection, assessment, personalised learning, privacy, and well-being (Vuorikari et al., 2020).

For instance, artificial intelligence plays a crucial role in providing personalised guidance to students, tailoring educational content to their unique learning styles and pace. In this context, the educator recognises the benefits of AI but still upholds ethical standards - protecting student data and actively working to minimise bias in AI-driven recommendations (European Commission, 2022).

AI-generated and interactive content significantly enhances students' learning experiences. In this situation, Educator 5.0 embraces the role of a critical observer, monitoring AI-generated materials for accuracy, cultural sensitivity, and inclusivity (European Commission, 2022). The role of the educator is crucial in ensuring that technology contributes to the educational environment but also promotes diverse perspectives and engages students in a culturally aware manner.

And lastly, a scenario in which AI becomes an assistant to educators in tasks such as curriculum development, resource creation, and classroom management. Here, ethical challenges arise as the educator maintains a focus on human expertise while integrating AI suggestions, fostering a balance between AI-driven efficiency and pedagogical justification (U.S. Department of Education, 2023).

In light of the above, educators must develop competencies to expand teaching and learning approaches and embrace AI technology through the following models and frameworks. The TPACK model (Koehler et al., 2014) emphasises sound technological, pedagogical, and content knowledge. In addition, enhancing digital competencies through DigCompEdu (Redecker, 2017) enriches educators' digital skills with specific categories and elements for various levels. As the ‘Ethical guidelines’ for educators (European Commission, 2022) supplement this DigComEdu model with ‘competence elements’ and ‘potential indicators’ it becomes clear that the implementation of Artificial Intelligence demands enriched profiles in education. The third model (Krebs et al., 2023) integrates 21st-century skills like critical thinking, judgement, sociolinguistic, intercultural, and interpersonal skills (Caena et al., 2019; Ehlers, 2023). In this way, we support the transformation of educators who are prepared for the demanding era of human-centred technology use in education.

The project resources aim to enhance stakeholder awareness by transparently presenting the opportunities, challenges, limitations, and prerequisites of AI applications in education. Not only do tangible outputs of the project address these challenges but also involve stakeholders as active participants, fostering reciprocal dialogue. This approach emphasises that AI trustworthiness (HLEG AI, 2019) in teaching is not a one-time event but a continuous process of professional development. Various formats, such as focus groups, courses, workshops, and reflection loops, are offered to support this ongoing development.

4. Conclusion

Beyond the technological considerations, educators are becoming multifaceted professionals. They act as facilitators of learning, guiding students through active learning experiences that promote collaboration, critical thinking, and problem-solving (Le Borgne et al., 2024). As technology integrators, educators effectively incorporate digital tools into

instruction, assessment, and communication. With a high level of AI literacy, they personalise learning experiences by tracking student progress and adjusting teaching strategies (U.S. Department of Education, 2023). Aware of the consequences of independent performance of AI systems, they act responsibly in 'the teacher in the loop' (Vuorikari et al., 2020) scenarios, protecting the data privacy and security of the students and universities. They understand algorithmic decision-making and critically assess the societal impact of AI (Pelletier et al., 2024). Advocating for inclusion, educators promote diversity and equity and create inclusive classrooms that address cultural biases (EU Commission, 2022). They also play a crucial role in supporting mental health, recognising signs of distress and connecting students with appropriate resources (Pelletier et al., 2024). As lifelong learners, educators continually update their knowledge and skills through professional development. This dynamic shift underscores the evolving nature of education in the digital age, where technology and the expanded roles of educators work hand in hand to enhance learning outcomes and student well-being.

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