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Artificial Intelligence Literacy: Human and Intelligent Machine Alliance - Learners' Insights

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Abstract

This study examines learners' insights into how Higher Education can make a big step forward so as to train students not only for the demands of the labour market of the 21st century, but also for the societal challenges that young graduates face in the light of the rapid development of Artificial Intelligence. Fifty students from different European universities commented on the use of Artificial Intelligence, expressing their views about AI literacy, its ethical use in universities and, at the same time, recommending caution due to the lack of awareness of the dangers that this technology poses. The brainstorming technique[2] was used to generate ideas and extend students' answers. Five groups of ten students were interviewed and the facilitator guided them towards developing a flow of ideas around the theme of Artificial Intelligence and its use for educational purposes. The findings of the study are in line with the latest research on the topic, with students highlighting the difference between ethical and unethical AI use and the need for proper training in order to gain and develop AI literacy[3], nonetheless emphasising the threats that may arise if this technology is not used properly[9] and the risks generated by the imperfect and hasty educational strategies[19]. This study can facilitate the understanding of how the rapidly-changing educational environment challenged by technology imprints its repercussions onto the new generation of graduates.

Keywords: *Artificial Intelligence literacy, Higher Education, learners, suggestions and recommendations*

1. Introduction

Artificial Intelligence has challenged the traditional educational approach and Higher Education institutions all over the world aim at tackling both the benefits of AI use and its transformative potential and the challenges of AI implementation in terms of ethical concerns and data protection. What is more, students' interest in using AI for educational and personal purposes has increased, therefore it is essential for researchers to explore their perspectives, as well. With regard to educational purposes, AI is used by learners primarily in order to clarify certain theoretical aspects and generate content. However, these technologies might have a negative influence on critical thinking and motivation.
This paper investigates learners' insights into the future of education in the light of the rapid development of AI technologies, with an academic focus on their experiences of using these applications. The brainstorming technique has been used as the ideal tool for group-idea generation. Five groups of ten students from different international universities were interviewed and the facilitator encouraged them to develop their ideas about the use of AI for educational purposes. The results of this study align with the latest AI research findings, emphasising the need to understand students' perceptions regarding the multiple benefits of AI integration in Higher Education and also addressing their concerns about the potential drawbacks.

2. Literature review

These days, there is a growing interest in the use of Artificial Intelligence (AI) in education, especially since the introduction of Chat GPT in November 2022, as it has transformed the learning and teaching experience, holding the potential to revolutionise the educational landscape [12], and, at the same time, addressing the needs of a diversified range of students, including traditional students (in-person education), online students, adult learners or career changers [5]. For instance, learners may benefit

from personalised tutoring [18], which can enable them to access content suitable to their learning pace and adapted to their learning needs [7] and, therefore, support learning and lead to academic success, based on the fact that AI provides a more engaging learning experience [5], while being empowered to manage the complex relationship between all the stakeholders [22]. Moreover, Generative Pretrained Transformer enables users to diversify educational strategies and improve the educational outcome[8]. Needless to say, these technologies will undoubtedly be refined in the future and improve in quality and accuracy of output [13], increasingly impacting education.

Nevertheless, AI practical application in Higher Education seems to remain uncertain [23] as concerns have been expressed with regard to ethical issues [22], since content can be used to manipulate and deceive students, and, as a consequence, they can be socio-psychologically affected by alienation and isolation, lack of human interaction and barriers in communication [16], which can affect the quality of the educational process[10]. Consequently, policies and regulations centered on governance, use and accountability need to be drawn in the near future [14]. What is more, universities are required to work collaboratively with learners to design guidance and consider students' voices when developing these policies [19]. Another negative aspect is that AI algorithms are exposed to the internet biases and and are also able to learn bias on their own [12], therefore human control over AI generated content is essential. Moreover, in terms of assessment, educators can enhance learners' abilities to navigate through an AI-enabled world by setting tasks that can be solved peculiarly by humans, deliberately focusing on areas where human mind can perform better than machines [1].

3. Methodology

This research used a qualitative inductive method, researchers exploring learners' insights into AI use in Higher Education. Responses from fifty students (divided into five groups of ten participants, according to the recommendations for effective group brainstorming in order to have more synergy and persistence [4]) from various European universities were gathered, then patterns and themes were identified and, finally, explanations, based on the identified patterns and grounded in data, were developed. Brainstorming was considered the best tool for group idea generation [11], as the power of association leads to new concepts and associations [16]. The facilitators were responsible for structuring the interaction so as to encourage evenly each member of the group to express and extend their answers with the purpose of enhancing ideas and achieving the goals of the research. The facilitating process clarified the expected outcomes and fostered an environment conducive to creative production [16]. The brainstorming sessions were held between March 2024 and May 2024 and this work is part of a larger study based on qualitative research methodology that involves perspectives of different Higher Education stakeholders [17].

Two main questions were addressed during the brainstorming session:

1. "What are your experiences and perspectives with regard to AI implementation in Higher Education institutions?"
2. "What additional comments on AI use for educational purposes would you like to make?"

The opinions expressed by the students were codified by the researchers, following the "paper and pencil approach"[21] and, afterwards, the MAXQDA software was used in order to process the data collected in the brainstorming session and generate graphs and charts. MAXQDA software enables the researcher to construct visualisations and semantic networks [6], but it does not replace the role of the researcher in the coding process. Instead, it encourages the researcher to reflect on the results obtained [15].

4. Results and Findings

This study involved fifty participants divided into five groups of ten students from different European universities, who were actively encouraged to share their experiences and perspectives on AI implementation in Higher Education and comment on the use of AI for educational purposes.

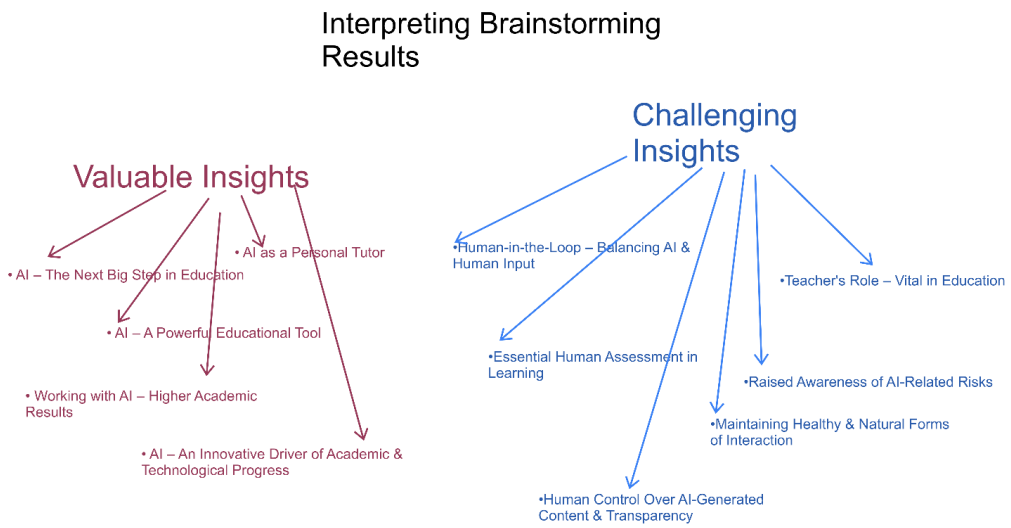

Fig. 1. Interpreting Brainstorming Results (MAXQDA Map)

4.1. Valuable Insights:

- **AI – The Next Big Step in Education**
- **AI Implementation – Beneficial for Learning**
- **AI as a Personal Tutor**
- **Working with AI – Higher Academic Results**
- **AI – A Powerful Educational Tool**
- **AI – An Innovative Driver of Academic & Technological Progress**

All the five groups interviewed reached consesus about their positive attitudes towards AI use for educational purposes and its implementation in Higher Education, on the condition that this process is carried out rigorously and properly, “handled with outmost care” (G1,S3), as “it is necessary to follow a state of balance and moderation” (G3, S25), “proceed with caution” (G4, S31) and “ensure proper legislation and regulations” (G3, S26). The members of the five groups suggested the idea of a favourable outcome of AI in education, as it could be “the next big step forward” (G2,S17) in the “the preparation of different teaching materials” (G2, S13) and evolution of our educational system (G1, S7, G5, S43).
The five groups agreed on the benefits of adapting the educational process to the fast-developing AI technologies, which have the potential to become “a powerful educational tool” (G2, S16), “useful in supporting learning and academic development” (G2, S17), “personalising learning and feedback” (G3, S21), therefore AI literacy plays an important role in academic and professional progress. Furthermore, students have “better academic performance” (G2, S17), “increased degree of involvement in terms of learning and seeking new information” (G4, S37) and gain “important skills for the future” (G1, S10). Adding to this, the five groups emphasised the role of AI assistants as private tutors, tailoring educational content to their learning pace (G2, S14) and “through interactive simulations and virtual assistance, this approach brought excitement to the classroom” (G3, S23), leading to “constant evolution” (G5, S43).
Moreover, emphasis was placed on achieving the full potential of AI by orienting it “towards ethical and social values, respecting the principles of transparency, fairness and accountability” (G2, S17), consequently contributing to academic and technological success” (G2, S20) of both the individual and “the country” (G4, S40).

4.2. Challenging Insights:

- **Human-in-the-Loop – Balancing AI & Human Input**
- **Teacher's Role – Vital in Education**
- **Maintaining Healthy & Natural Forms of Interaction**
- **Essential Human Assessment in Learning**

- **Raised Awareness of AI-Related Risks**
- **Human Control Over AI-Generated Content & Transparency**

Conversely, the challenges of using AI for educational purposes emerged during the brainstorming process, members of all five groups expressing concerns about balancing AI and human input, the role of the teacher being vital for academic success. There was a clear collective opinion that AI technologies need to be taught, not just provided, because “it is important to learn how to use them correctly” (G1, S1), “to proceed with caution” (G4, S31) and “to understand and adapt to the impact of AI students’ lives and society” (G3,S26). Educators bear the responsibility of guiding students “to find information and content that is suitable to their interests” (G5, S42) and “adapted to various tasks” (G5, S50) and helping them “combine ideas generated by AI with their own” (G1,S4) in order to ensure “a holistic and qualitative learning experience” (G2, S2). The role of educators needs to be preserved, otherwise “human interaction can be destroyed” (G5, S44) and AI can be used “excessively and irresponsibly” (G3, S27), “damaging the educational process” (G3,S29). Moreover, “humans, through their personality and uniqueness, make things happen based on thinking and feeling” (G3,S29), therefore keeping the human in the loop is essential “to continue to promote healthy and natural forms of interaction” (G2,S13) and educators are the ones who can offer proper training, teaching students to analyse critically AI-generated content and genuinely enhance the flow of ideas.
Additionally, the AI-associated risks were discussed within the five groups, addressing the issues related to “ethics and data security” (G2, S19), which “require careful management” (G4, S33), and recommending to remain “vigilant about its potential negative impact” (G2, S20) in order to “counteract through defensive mechanisms” (G3, S25), AI technologies being regarded as a “nebula that we can not control at the moment, a non-essential extension in human evolution” (G3, S27).

5. Discussion

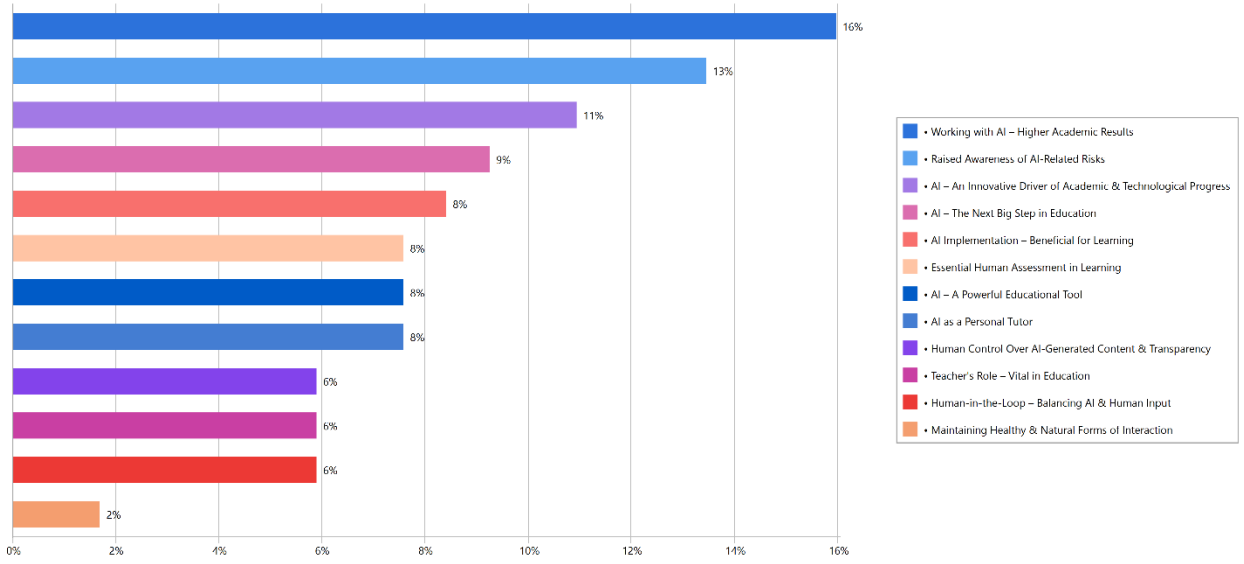

Chart 1 – Results interpretation (MAXQDA Chart)

As reflected by Chart 1, Figure 2 and group dynamics during the brainstorming session, all the five groups reached a similar conclusion, which aligns with a global trend: working with AI has the potential to lead to higher academic results (high convergence), participants exploring the prospects of using AI as a strong educational tool and considering AI implementation in Higher Education beneficial for learning and AI literacy essential for future better opportunities on labour market.
The next convergent point during discussions targeted ethical considerations, students emphasising the risks that users could be exposed to and recommending caution in the process of learning and teaching, due to the loss of privacy and the biases that can be embedded in the software, which echoes views already globally debated in universities.
Another common point of agreement was the fact that AI may become an innovative driver of academic and technological progress, because, with the help of intelligent assistants, humans can learn and work faster and better, exploring future possibilities from a different angle, as opposed to the way it was done before AI. Students expressed the view that, by maximising the potential of AI, they

can gain better skills prompted by AI literacy and this places them in good prospects for the future world of employment.

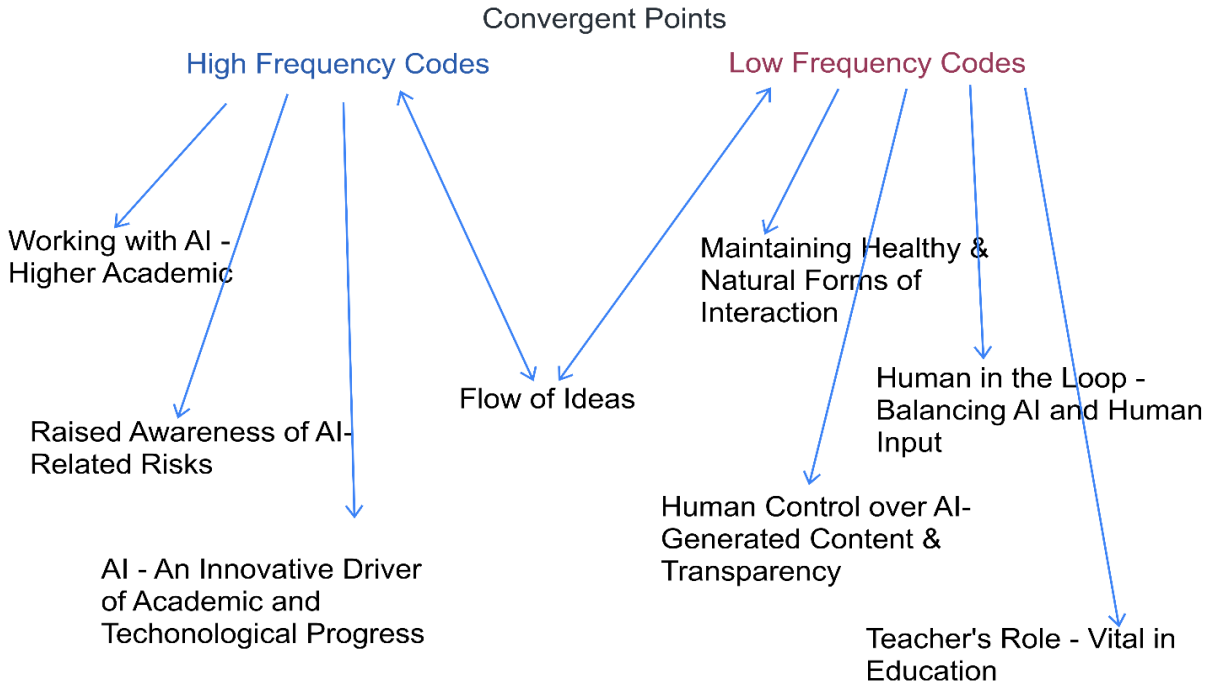

Fig. 2. High Convergent Points; Code Frequency (MAXQDA Map)

The next discussion points revolved around keeping the human in the loop, how humans need to control AI-generated content and how to balance the virtual and natural interaction. These points were explored only briefly during the sessions, which can reveal the fact that the participants may not have struggled with such issues or they may not have given further thought to the impact of overusing AI in education as a contrast to using the traditional educational methods.

The participants of the five groups discussed swiftly the teacher's role, which could lead to the assumption, based on serious concerns about the risks associated with AI, that human presence in the classroom is considered per se, with students naturally regarding teachers as indispensable.

Significantly, it should also be noted that no divergent points were expressed during the brainstorming session, which reflects the idea that, at this point, learners are concerned about similar aspects of AI use, targeting its obvious positive and negative potential.

6. Conclusion

This study highlights the students' insights with regard to the human and intelligent-machine alliance, its exploratory nature providing clarifications of various aspects of AI use for educational purposes, both valuable and challenging. The opinions expressed during the brainstorming session emphasise the present focus of research into AI.

The study highlights the importance of understanding learners' main opinions and concerns about AI use for educational purposes, which can generate useful discussions at university level and assist different stakeholders with guidance so as to integrate AI into the educational process effectively, maximising all the possible outcomes and minimising the risks.

The research suggests that students are already familiar with AI, even if they have a disparate understanding of how to work with AI, and navigating the intricate educational landscape presently modified by AI leads them to seek further guidance and assistance from their teachers, university management and policy-makers.

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