The Critical Challenges of Artificial Intelligence in Education

Mohammed Saqr[1], Sonsoles López-Pernas[1], Miguel Á. Conde[2,3], Olga Pavlovic[4], Miroslava Raspopovic Milic[4]

1 University of Eastern Finland, School of Computing, Yliopistokatu 2, 80100 Joensuu, Finland

2 University of León, Escuela de Ingenierías – Campus de Vegazana S/N, León, 24071, Spain

3 Universidad de Salamanca, Escuela Politécnica Superior de Zamora – Av. de Requejo, 34, 49029 Zamora, Spain

4 Belgrade Metropolitan University, Faculty of Information Technology, Tadeuša Košćuška 63, 11000 Belgrade, Serbia

1. Introduction

Throughout history, technology has played a transformative role in shaping societies, reframing economies, and changing the way we produce and consume knowledge. Waves of technological advancement have always been associated with ripples of hope and societal aspirations as well as anxiety and cautious anticipation of the disruption. The recent breakthrough in generative artificial intelligence (AI) capabilities is another example, yet with a breathtaking speed [1]. The accelerated pace with which generative AI has evolved has broadened these fears among many [2, 3]. In tandem with the pace, generative AI is also spreading to novel areas and applications almost every day [4]. Whereas technology and innovation are facts of life, the disruption has always affected manual and low-skilled jobs. This is not the case with AI. The latest generative AI has proven to replicate high cognitive functions that were long believed to be an exclusive preserve of highly educated humans. In layman's terms, there is a new player in town and the word is that the new player will take over the whole town [5].

Whether it is hype or reality, it is too early to know. Nevertheless, the fear of AI dominance may be justified by several credible examples in the past where automation has been both transformational and disruptive across a wide range of social and industrial domains. Lessons learned from automation tell us that AI can, on the one hand, contribute to the rejuvenation of economies and the creation of new jobs that capitalize on AI products and services. On the other hand, AI may —and most probably will— change professions and reshape our knowledge-based economy. Therefore, education has to respond to these new realities if they may arise [5]. If the past has told us anything, it is that transformations did not happen overnight or result in sudden mass unemployment, but rather allowed for a gradual transition from reliance on agriculture to industrialization. Such gradual transformation has helped societies to adapt, and in many cases, has left the old side-by-side with the modern. The recent wave of AI —though fast-paced— should not be different [6].

Among the critical challenges we face with AI is to manage a transition where we prepare the next generation of students to meet the job market demands, modernize our curricula, and promote diversity and inclusion. A transition where benefits are shared across society at large to avoid the "paradox of plenty," in which society is rich in aggregate but many are left behind in need [5]. The challenges with AI extend our evaluative judgment of AI and the byproducts thereof. It is no secret that AI has been plagued by perpetual cycles of overhype. Over the past decades, AI has gone through multiple cycles of hype, subsequent disillusionment, criticism, and a reduction of funding for research and industry. Therefore, a critical realistic approach is both necessary and essential. Several researchers are therefore calling for critical AI literacy to be an essential part of our education besides AI skills [7, 8].

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EMAIL: mohammed.saqr@uef.fi (A. 1); sonsoles.lopez@uef.fi (A. 2); mcong@unileon.es (A. 3); olga.mijailovic@metropolitan.ac.rs (A. 4); miroslava.raspopovic@metropolitan.ac.rs (A. 5)
ORCID: 0000-0001-5881-3109 (A. 1); 0000-0002-9621-1392 (A. 2); 0000-0001-5881-7775 (A. 3); / (A. 4); 0000-0003-2158-8707 (A. 5)

Furthermore, the world is messy, chaotic, and far from perfect and so is the data that has been fed into AI models [9]. The rush to embed AI into real-life applications without proper guardrails or audits has resulted in catastrophic results that affected the most vulnerable factions of society. A large strain of such examples extend from education to tax evaluation. Unfortunately, these problems continue to appear on a daily basis. Take for example Google Gemini which was accused of racism just last month and the long strands of examples of gender, racial, and political bias that flood social media from other generative AI models. It is inconceivable to think that any benefits can outweigh the possible harms that are possible if AI is abused or misused if it falls into the wrong hands given what we have experienced when it is in the "right hands" [10].

Reliance on AI will probably depend on sanitizing AI and making AI byproducts safe, accurate, consistent, and devoid of bias. So far, the progress in AI has been evolving hand in hand with cracks and loopholes appearing in AI models. Only the future will tell if we will be able to harness the transformative power of AI or live with an unrestrained monster. Education has to be prepared for either situation by making critical AI literacy a central component of our curricula. Critical AI literacy entails being able to evaluate and question AI systems and tools, as well as their safety and judgment. This requires students to understand, not only how to make use of AI tools, but also —to some extent— the underlying mechanisms of how AI works to be aware of potential biases and unfair situations, as well as the limitations of what AI can do. Only then, our students will be prepared for whatever the future will bring.

In conclusion, the transformative potential of AI in education is undeniable. However, we can only realize such aspirations if we approach AI with a critical lens. To do so, we must equip students with critical AI literacy to empower them to navigate the complexities and ensure that AI works for the welfare of humanity. This critical literacy will not only provide students with the skills needed to succeed in the future job market but also help build a generation of responsible AI users who can leverage this technology for the greater good and avoid its drawbacks.

2. References

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