Learning analytics in the age of AI: Will we see the promised learning revolution?

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Abstract: Current advances in generative AI represent a paradigm shift for educational technology. Affordances of generative AI change our perceptions of what can be possible, prompting to re-evaluate research questions, interventions, and applications in the field of educational technology. Against this backdrop, what should the focus on using data to inform teaching and learning look like? Learning analytics, an applied domain centred on data about learners, their processes, and learning artefacts, has gained traction over the last decade. The talk will take a historical perspective to position learning analytics within existing educational technology paradigms and discuss it within the context of AI, highlighting the adjacent possible for the future development.

Keywords: learner capabilities, learning analytics, AI, educational technology

1 Introduction

For those unfamiliar with the field of educational technology, the recent surge in generative AI might appear to be a ground-breaking advancement. However, experts and practitioners in educational technology have witnessed similar cycles of hype and promises of revolutionary transformations before. Additionally, the scholarship surrounding artificial intelligence in education (AIED) has been steadily evolving over the past few decades, providing well-researched recommendations for the design and implementation of AI systems in education. In this discussion, I will contextualize generative AI within the broader historical development of educational technology and the existing body of work in AIED. By doing so, I aim to assert that the changes brought about by generative AI are indeed significant and warrant attention, prompting us to reconsider our research questions and explore new applications of technology in the realm of teaching and learning.

2 Learning Analytics

The use of data collected by educational technologies during teaching and learning, known as learning analytics, is a relatively new development in educational technology. The implementation and potential innovation possible with learning analytics are closely tied

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to legal regulations about data usage. As a result, the adoption and use cases of learning analytics vary among instructors, learners, and administrators in terms of how they utilize the data for decision-making and activities. The fundamental idea behind learning analytics is that data streams capturing students' activities when studying with technology can be transformed into insights about learning, which can then be presented to students or instructors with the noble goal of improving educational practices.

To provide an overview of the current development of learning analytics, I will briefly discuss different types of use cases. These include predictive analytics, multimodal analytics, writing analytics, curriculum, and employability analytics, each aiming to address specific problems and advance learning outcomes. In addition to analyzing data, sensemaking plays a central role in learning analytics. It expands the concept of a feedback loop to encompass human activity, attitudes, and perceptions of data during the learning or teaching process. Upon providing examples of learning analytics, I will comment on its challenges such as adoption, reproducibility, and implications for equity. Despite the diverse implementation of learning analytics, my major assumption is that it complements and enhances teaching and learning by strengthening and supporting these processes.

3 The Intersection of Data and Generative AI in Education

Three decades ago, Gavriel Salomon identified three key reasons why educational technology often fails to meet its expectations. These reasons include trivializing the potential benefits by applying new technologies in trivial ways, adopting a technocentric perspective that places excessive faith in technology alone, and conducting research that is misguided by narrowly focusing on specific questions related to the use of technology in the classroom. I will discuss how current applications around generative AI often fall into the same pitfalls. Salomon also offered a vision for human-AI partnerships, emphasizing that intelligent technologies need to reach beyond the so-called ‘effects with’ tools – a reference to a simple optimization of joint tasks conducted by humans and technologies. This vision imagines that intelligent tools enhance human cognition in ways that persist after the use of technology. This view is also advocated in contemporary scholarship that shifts the focus to non-epistemic outcomes and supporting learners with domain-generic transferable skills. In the talk I will reflect on how learning analytics can contribute to this vision, while being transformed by generative AI into a new generation of approaches for data-informed teaching and learning.