



What do students at distance universities think about AI?

Wayne Holmes

Institute of Educational Technology

The Open University

Milton Keynes, UK

wayne.holmes@open.ac.uk

Stamatina Anastopoulou

School of Museum Studies

University of Leicester

Leicester, UK

stamatina.anastopoulou@leicester.ac.uk

ABSTRACT

Algorithms, drawn from Artificial Intelligence (AI) technologies, are increasingly being used in distance education. However, currently little is known about the attitudes of distance education students to the benefits and risks associated with AI. For example, is AI broadly welcomed by distance education students, thought to be irrelevant, or disliked? Here, we present the initial findings of a survey of students from the UK's largest distance university as a first step towards addressing the question "What do students at distance universities think about AI?" Responses from the 222 contributors suggest that these students do expect AI to be beneficial for their future learning, with more respondents selecting potential benefits than selecting risks. Nonetheless, it is important to extend this exploratory study to students in other universities worldwide, and to other stakeholders.

Author Keywords

Algorithms; Artificial Intelligence; distance education; student attitudes, survey.

ACM Classification Keywords

K.3.1 Computer Uses in Education.

INTRODUCTION

Of the more than 60 'open universities' around the world, the UK's Open University (OU) was the first to be established (in 1969). Currently, it provides distance education to around 150,000 students registered for qualifications, as well as to more than 12 million informal learners. As the OU uses online technologies to engage with its students, it might be assumed that like many online providers it offers a one-size-fits-all curriculum, providing standardized products and services—educational courses mostly comprising learning content—that are 'efficient' [10]. However, to avoid one-size-fits all curricula, the OU follows a blended learning approach, where each student is appointed a tutor and is invited to attend both online and face-to-face tutorials. Blended learning is well-known to have a broadly positive

effect in education, from reducing dropout rates to improving examination outcomes [7].

In recent years, algorithms drawn from Artificial Intelligence (AI) technologies, have become a mainstream addition to distance education provision. In particular, discussions have expanded beyond the purely technical, to include issues as wide-ranging as learning *with* AI, learning *about* AI, AI's ethical consequences, and issues of diversity and equity. However, perhaps surprisingly, little is known about the attitudes of learners as the potential users of AI in distance universities to the benefits and risks associated with AI. For example, does the use of AI in distance education lead students to fear the elimination of human interactions with tutors? More generally, is AI broadly welcomed by students in distance universities, thought to be irrelevant, or disliked?

The student response to Summit Learning, a commercial AI tutoring system partly funded by the Chan Zuckerberg Initiative, is salutary:

Unfortunately we didn't have a good experience....

Most importantly, the entire program eliminates much of the human interaction, teacher support, and discussion and debate with our peers that we need in order to improve our critical thinking. Unlike the claims made in your promotional materials, we students find that we are learning very little to nothing. It's severely damaged our education, and that's why we walked out in protest. [13]

The opinions of such key stakeholders are necessarily of interest to distance and online educators. Accordingly, as a first step towards addressing the question "What do students at distance universities think about AI?", we undertook a survey of students at the UK's largest distance university. Here we report our initial findings, drawing on the contributions of the 222 respondents.

THE GAP IN THE LITERATURE

A review of the L@S proceedings from 2014 to 2017 [5] reveals that to date little attention has been given to the attitudes of students in distance learning settings to the arrival of AI in their universities. Instead, for the most part, L@S papers focus on topics such as systems for learning at scale, interactions with sociotechnical systems, and understanding online students [12]. Systems papers tend to investigate technologies that vary by how much they amplify human effort (e.g., one-to-one, one-to-many, and many-to-

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many). Interaction papers tend to study both individual and group interactions with learning technologies. Finally, student-centric study papers focused on modelling knowledge and on promoting global access and equity. There is no mention of a paper that focuses on student attitudes to the use of Artificial Intelligence. Similarly, a review of the AI in Education (AIED) International Conference proceedings (i.e., AIED 2015, AIED 2017, and AIED 2018), did not reveal any directly relevant papers. For each of the sample conference papers, the title, often the abstract and where necessary some of the full text, was read and evaluated. In addition, keywords (such as survey, questionnaire, attitudes and students) were used to search each paper's full text. Naturally, this approach did highlight many papers, but most used their surveys to investigate student attitudes to the particular AIED technology being investigated (i.e., they were usually post-intervention satisfaction surveys) [1,9,11]. Other papers used surveys to investigate issues of relevance to teachers, such as tools to facilitate the design of AI-driven learning environments [4] or to automatically generate questions [6]. Interestingly, the review did reveal a citation to one paper about the attitudes of students to a related domain, that of computer science [14], reinforcing the potential usefulness of such an inquiry. However, no papers were found that reported investigations into students attitudes to Artificial Intelligence in education in general, or to AIED's overall potential benefits and/or risks, or to the use of AI in distance education settings.

METHODOLOGY

An online survey was designed with the aim of eliciting 'the student voice' on the potential of AI applied in distance education. In particular, the survey explored the students' thoughts, opinions, understanding of, and emotional disposition towards the application of AI to support students, staff, teaching and learning. The survey comprised 13 closed

questions and 10 open-ended questions. The closed questions include multiple choice questions and 5-point Likert scale questions (ranging for example from "Very likely" to "Very unlikely"). Typical questions include: What does 'Artificial Intelligence' mean to you? How useful would the following applications of Artificial Intelligence in distance education be for teachers or students? What do you think are the most important potential benefits of Artificial Intelligence in distance education? What (if any) ethical concerns do you think there are around the application of Artificial Intelligence in distance education? The survey also asked about the students' confidence in using computers or other digital technologies. Finally, before it was opened to students, the survey was reviewed and approved by the university's survey ethics committee.

The survey was conducted at the Open University (OU), the UK's largest higher education institution, during December 2018, for a population of 63,789 students studying during the academic year 2018-2019 and living in the UK. A sample of 2,500 students were invited to participate, of whom 222 (~9%) responded (with 125 giving complete responses and a further 97 giving incomplete responses; undertaking the survey was voluntary and no questions were compulsory). In addition, students were assured that their participation was not linked to their studies. For each respondent, demographic information was captured automatically, drawing on university records.

Most of the respondents were female (66%) mature students (47% were aged 26-45, and 33% were aged 46 or over), and 10% declared a disability, all of which is closely representative of the OU's general student population. The large majority of respondents (80%) identified themselves as 'confident' or 'very confident' in using computers or other digital technologies (which is perhaps unsurprising as the students are enrolled at an online distance university).

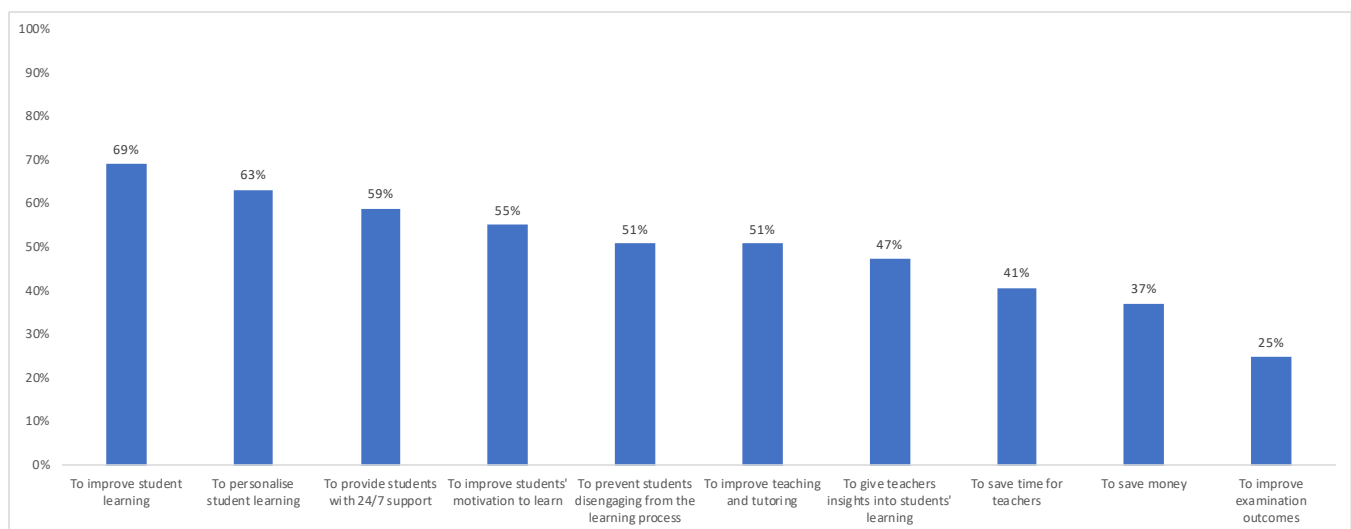


Figure 1. What do students think are the most important potential benefits of AI in distance education?

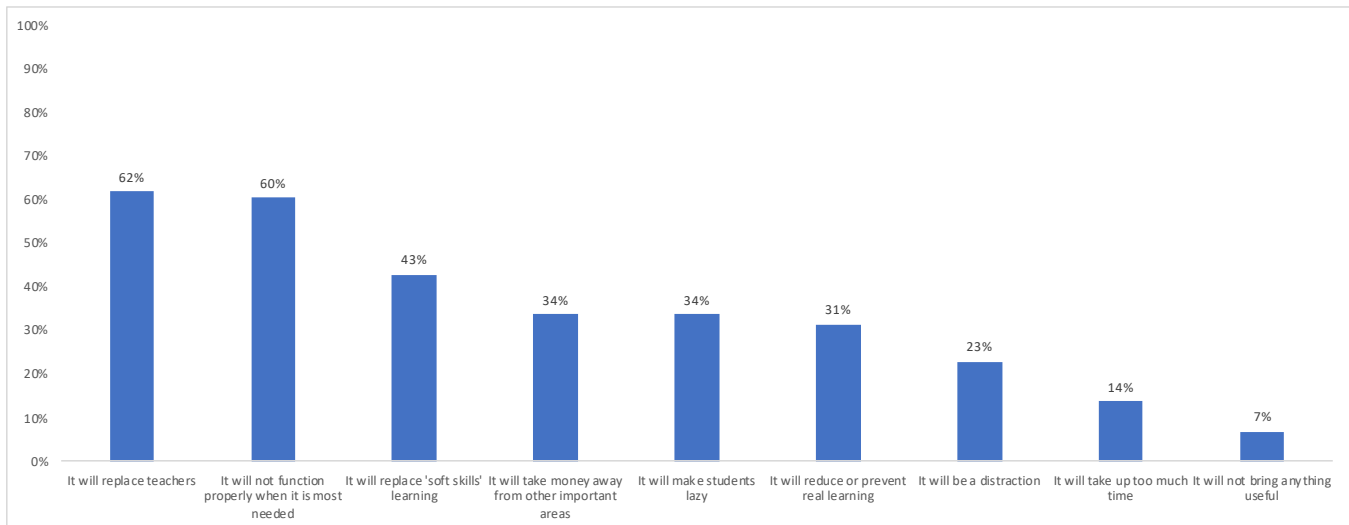


Figure 2. What do students think are the most important potential risks of AI in distance education?

RESULTS

Because of the breadth of the survey, data analysis is ongoing. Here, we focus on just two of the closed multiple-choice questions, those that focus on the benefits and risks of AI in education: “What do you think are the most important potential benefits of Artificial Intelligence in education?” and “What do you think are the most important potential risks of Artificial Intelligence in distance education?”. For each of these, respondents were able to select one or more of the 10 or 9 available options (and were able to add their own answers, which are yet to be analyzed). A descriptive statistic for each option was calculated: the number of respondents who selected the particular option as a percentage of all the respondents who selected at least one of the question’s options.

Student Perceptions of the Benefits of Artificial Intelligence in Distance Education

138 respondents selected at least one option in this question. Of those respondents, as illustrated in Fig. 1., the largest percentage (69%) selected “to improve student learning” as a potential benefit of AI in distance education. Similarly, 63% selected “to personalize learning”, 59% selected “to provide support, and 55% selected “to motivate students”. Interestingly, smaller percentages of respondents selected the teaching-orientated options: 51% selected “to improve teaching”, 37% selected “to save money”, and 25% selected “to improve exam outcomes”. In short, most respondents selected learning benefits more than they selected teaching benefits. Perhaps most notably, while this is an argument often made by commercial AI systems developed for education [3], only 41% selected “to save time for teachers”.

Student Perceptions of the Risks of Artificial Intelligence in Distance Education

131 respondents selected at least one option for this question. Of those, as illustrated in Fig. 2., the largest percentage

(62%) selected “it will replace teachers”, closely followed by 60% of respondents who selected “it will not function properly when it is most needed”. With regards to the possible risks of AI for learning, 49% selected the option “it will replace soft skills learning”, 31% selected “it will reduce or prevent real learning”, 34% selected “it will make students lazy”, and 23% selected “it will be a distraction”. Finally, only 14% of respondents selected the option “it will take up too much time” while only 7% of respondents selected “it will not bring anything useful”.

DISCUSSION AND FUTURE DIRECTIONS

Although representing the views of only a small sample of students from one distance university, these initial results suggest that students in general do expect Artificial Intelligence to be beneficial for their future learning (e.g., almost two thirds of respondents agreed that AI could support learning, and more respondents selected potential benefits of AIED than selected risks). Nonetheless, even though we have analyzed only two closed-questions, there seem to be some lessons emerging. In particular, almost two thirds of respondents agreed that there is a risk that AI will replace teachers, which is a commonly-expressed concern [2], understandable given the implicit aims of much research. Whether or not this is a genuine possibility [8], this concern clearly deserves further attention.

Finally, we acknowledge that the relatively small number of respondents, for such an important set of questions with profound implications, is disappointing; and we can only speculate the reasons (perhaps AI in education is not that interesting for distance education students, or perhaps students are just too busy). Nonetheless, it seems important to extend this exploratory study to students in other universities worldwide, and to other stakeholders, for both of which we welcome collaborations.

CONCLUSION

While the L@S community mostly focuses on learners' behavior and the data that they generate when interacting with large-scale online learning platforms, this paper introduces the student voice. As learning at scale is increasingly affected by the use of algorithms drawn from AI technologies, it is important that we understand better the attitudes of key stakeholders. Here, we begin with a survey of distance education students at the UK's largest university. The results not only raise new questions for the study of learning at scale, but also suggests some challenges. For example, how do we further reveal and then address the concerns of learners in distance settings about how algorithms might impact on their studies?

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