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What distance learning students want from an AI Digital Assistant

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What distance learning students want from an AI Digital Assistant

Abstract

With the release of Generative AI systems such as ChatGPT, an increasing interest in using Artificial Intelligence (AI) has been observed across domains, including higher education. While emerging statistics show the popularity of using AI amongst undergraduate students, little is yet known about students' perceptions regarding AI including self-reported benefits and concerns from their actual usage, in particular in distance learning contexts. Using a two-step, mixed-methods approach, we examined the perceptions of ten online and distance learning students from diverse disciplines regarding the design of a hypothetical AI Digital Assistant (AIDA). In the first step, we captured students' perceptions via interviews, while the second step supported the triangulation of data by enabling students to share, compare, and contrast perceptions with those of peers. All participants agreed on the usefulness of such an AI tool while studying and reported benefits from using it for real-time assistance and query resolution, support for academic tasks, personalization and accessibility, together with emotional and social support. Students concerns related to the ethical and social implications of implementing AIDA, data privacy and data use, operational challenges, academic integrity and misuse, and the future of education. Implications for the design of AI-tailored systems are also discussed.

Introduction

Artificial Intelligence (AI) has been around for over half a century ([Bond et al., 2024](#); [Zawacki-Richter et al., 2019](#)). However, with the rapid evolution of AI applications in the last five years, in particular in the field of so-called Generative AI (Gen AI: [Kasneci et al., 2023](#); [Yan et al., 2023](#)) and popular applications like ChatGPT and Gemini, advocates of technology, policymakers ([European Commission, 2022](#)), scientists ([Bond et al., 2024](#); [Hamilton et al., 2023](#); [Kasneci et al., 2023](#); [Yan et al., 2023](#)), and tech companies like Google, Meta, and OpenAI argue that we are at the dawn of a new digital and societal revolution.

For many decades Artificial Intelligence in Education (AIED) researchers have been chasing the “Bloom dream” ([Bloom, 1984](#)), whereby AI technology can dramatically uplift student attainment through the provision of high-quality personalized learning. The arrival of ChatGPT in November 2022, exposing the affordances of AI based on Large Language Models outside of dedicated research laboratories, has raised the prospects of this dream becoming a reality ([D'Mello & Graesser, 2023](#); [Kasneci et al., 2023](#); [Yan et al., 2023](#); [H. Zhang et al., 2023](#)). With over 1.6 billion visits of ChatGPT in December 2023 in multiple languages, and a reported weekly user base of 100 million users, ChatGPT is most likely being used by many students as well as educators ([Duarte, 2024](#); [Freeman, 2024](#)). Emerging statistics of student usage of AI tools in November 2023 show that more than half of

UK students (53%) consult AI for marked work, with one in four using Gen AI to identify topics ([Freeman, 2024](#)).

In a recent tertiary (meta) review of 66 systematic literature reviews of AI in formal higher education or continuing education settings, [Bond et al. \(2024\)](#) indicated that the most reported positive benefit of the use of AI in education was personalized learning (38.7%), followed by greater insights into student understanding, positive influence on learning outcomes, and reduced planning and administration for educators. Nonetheless, most evident research gaps identified by [Bond et al. \(2024\)](#) across these studies were the ethical implications of using AIED (40.9%), the lack of diversity in methodological approaches (36.4%), and the specific need to apply research in wider educational practice (33.3%), and with a broader range of stakeholders beyond STEM (21.2%).

There is a paucity of research on what distance learning students think about the affordances and limitations of AI for their studies. In particular, given the increased focus on online and distance education, it is perhaps surprising that most of the research focused on Gen AI applications like ChatGPT seem to be focused on undergraduate STEM and Computer Science students studying at on-campus universities ([Bond et al., 2024](#)). In line with recommendations by [Bond et al. \(2024, pp. 31-32\)](#) and [Qiu et al. \(2024\)](#) for more AI research using mixed methods and design-based approaches that include students' perceptions of the AI effectiveness, we developed a design-based mixed method study.

In this first research cycle we involved students from a range of disciplines at the early stages of the development of a so-called AI Digital Assistant (AIDA). Using a so-called Voice of the Customer approach ([VoC: Freeman & Radziwill, 2018](#)), in a two-stage sequential approach of interviews with a subsequent online survey, we aimed to explore what distance learners expected in terms of the AIDA study services which might be afforded, and what their concerns might be.

Supporting distance learners with AI

Over the years a range of AI applications have been developed that might help to support the Bloom dream. For example, in a review by [Zawacki-Richter et al. \(2019\)](#) of 146 AIED articles four common AIED typologies were identified: 1) profiling and prediction ([Herodotou et al., 2019](#); [Herodotou et al., 2023](#); [Wolff et al., 2013](#)); 2) intelligent tutoring systems ([D'Mello & Graesser, 2023](#); [Li et al., 2022](#)); 3) assessment and evaluation ([Crompton & Burke, 2023](#); [Du & Xing, 2023](#); [Whitelock et al., 2014](#)); and 4) adaptive systems and personalization ([Fariani et al., 2023](#); [Iniesto et al., 2023](#)). These four common AIED typologies were also used in the subsequent meta-review of [Bond et al. \(2024\)](#) in order to classify which AIED approaches were most commonly used. Personalization in was the most common AIED application – see Figure 1.

➔ Insert Figure 1 about here.

While most AIED studies focus on the design and application of AI in blended and face-to-face settings ([Bond et al., 2024](#); [Zawacki-Richter et al., 2019](#)), according to [Bozkurt and Sharma \(2023, p. iii\)](#), “generative AI has the potential to transform distance education and online learning in many ways, including reimagining the roles of educators and universities”. Beyond the affordances already identified by [Zawacki-Richter et al. \(2019\)](#) of personalization, intelligent tutoring, and automatic grading, [Bozkurt and Sharma \(2023\)](#) argued that in particular distance learning institutions could potentially use Gen AI for content creation, thereby providing more variety and reducing production costs as well as personalized career advice.

Nonetheless, several challenges for distance learning institutions were identified by [Bozkurt and Sharma \(2023\)](#) when implementing AI, including bias in data and algorithms. In particular, given the often wide and diverse student profiles of students at distance learning institutions, relative to “traditional” universities, particular groups of learners might be disadvantaged or inappropriately labelled by AI ([Iniesto et al., 2023](#); [Nguyen et al., 2020](#)). Furthermore, there could be an overreliance on AI by students, which might negatively impact critical thinking and independent learning, as well as concerns around data privacy and security ([Scott, 2023](#)). Finally, under the term singularity [Bozkurt and Sharma \(2023\)](#) indicated that AI could become so powerful that it raises questions concerning the role of humans in the learning process, a concern which was also raised by [Hamilton et al. \(2023\)](#).

Research questions

With the recent advancements of Gen AI, it is essential that higher education institutions and distance learning providers in particular keep track of the affordances and limitations of AI, and test and evaluate potential AI solutions for and with their students. In this mixed method study, we used the concept of Voice of the Customer ([Freeman & Radziwill, 2018](#)) to explore what distance learning students think about an AIDA in relation to how it might address some of their teaching, learning, and support needs. Therefore, the following main research question was formulated:

- 1) What services would distance learning students expect from an Artificial Intelligence Digital Assistant (AIDA), and what are their potential concerns of such an AIDA?

Methods

Setting and participants

This explorative two-stage sequential mixed methods study was conducted at the Open University, a distance-learning institution established in 1969 in the UK. The Open University has developed a range of AI approaches to support teaching and learning, as indicated in Figure 1. For example, there

is extensive experience in terms of profiling and prediction by the AI tool called OU Analyse ([Herodotou et al., 2019](#); [Herodotou et al., 2023](#); [Wolff et al., 2013](#)). Open Essayist provides automated, interactive feedback and support for students as they write essays for summative assessment ([Whitelock et al., 2014](#); [Whitelock et al., 2018](#)). Furthermore, a critical reflection tool provides critical reflection and automatic content analysis of student evaluations ([Alrashidi et al., 2023](#)), while in terms of adaptive systems and personalization a Gen AI tool called Taylor provides students with accessibility needs an easier user interface ([Iniesto et al., 2023](#)) to disclose disability needs. In other words, while there is some substantial evidence of AI adoption within the Open University, most of these adoptions are focused on managing data for educators, while limited applications to scale have been provided directly to students.

Therefore, in the first stage following a demonstration of a possible AIDA distance learning students were interviewed about their expectations of using such AIDA (see next section). In the second stage, students completed an online quantitative survey constructed based upon interview data from the first stage. In this sequential process, both during the interviews and the follow-up surveys students were able to share their perspectives, and compare and contrast their perspectives with those from their peers.

A random sample of 400 students studying at a range of levels and disciplines were extracted from the institutional database. A personalized email was sent to these students on the 13th of December 2023, followed by two reminders. Potential participants could select one out of twelve possible timeslots to join an interview. In total 16 participants selected a time slot, 11 completed the informed consent form, and 10 participants joined one of the online interviews. As indicated in Table 1, a substantially diverse group of participants joined the interviews. One possible reason for the relatively small sample was that the study was conducted during the busy festive months.

➔ Insert Table 1 about here.

Instruments

Online interviews

In the first stage of this sequential design, we undertook six online interviews (3 with 2 participants each, 4 one-to-one). While the dynamics of the interview might have been possibly different when interviews were in pairs rather than one-to-one, as we continuously shared students' perspectives after the end of a respective answer participants were able to reflect on their own answers and those of peers whether they were interviewed individually or in pairs. Interviews lasted on average 54 minutes (range 45m17 to 1h16m58). After welcoming participants and reminding them of the overall purpose of the study by author BR, a visual artefact of a five-minute recording of a possible AIDA was screenshared. In this recording, Author JD illustrated three potential examples of AIDA that the Open

University might make available in the near future (i.e., automatic feedback on a set of open assessment quizzes of a particular unit in a module, AI generated flash cards for revision, and finally a digital avatar responding in real-time to student academic questions). The primary reason for sharing this visual artefact was to allow participants to activate any prior knowledge or experience with AI, and if participants had no experience with AI to prompt some initial thoughts and ideas of how AI might support their studies.

Subsequently, the following interview questions were raised in a semi-structured manner: 1) what feelings and/or thoughts do you have as a student in terms of such an AI Digital Assistant (AIDA)?; 2) what services would you expect from such an AIDA?; 3) what would you worry about when using an AIDA? After each discussion of a respective question, the evolving insights from other participants who had participated already in the interviews were shared in the form of text bullet points by the interviewer in a PowerPoint screenshare. At the first interview we shared the perspectives from the research team, and adjusted the information afterwards based upon the input from students. This allowed participants to sense check their answers ([Könings et al., 2014](#)), and further discuss any agreements or disagreements for each question.

Online surveys

In the second stage of this sequential design, building on the work of [Iniesto et al. \(2023\)](#) and the responses from the participants, a follow-up survey was shared with the 10 participants in January 2024 after the final interview was completed. This survey aimed to gather feedback from participants about the main results from the interviews, the key themes identified, and whether (or not) these resonated with them. It consisted of 18 closed Likert response questions constructed based upon the responses from participants during the interviews (1 = Totally Disagree, 5 = Totally Agree). These included four items based on expected services of AIDA (i.e., support for academic tasks; real-time assistance and query resolution, personalization and accessibility, and emotional and social Support; Cronbach $\alpha = .686$), and five based on broad concerns about using AIDA in teaching and learning (data privacy and use; academic integrity; operational challenges; ethical and social implications; and future of education; Cronbach $\alpha = .687$). Furthermore, nine items on the conversational user interfaces of the AIDA experience (e.g., I think that I would like to use such AIDA frequently; Cronbach $\alpha = .687$) were based upon scales adapted by [Iniesto et al. \(2023\)](#), which were previously successfully used for Taylor. Five open questions to gather further qualitative feedback and suggestions were included. In total 8 out of 10 participants responded to this follow-up survey.

Procedure

All interviews were conducted by BR, an experienced mixed methods researcher. Interviews were conducted online using MS Teams. All transcripts were subsequently anonymized and were uploaded per interview question in ChatGPT 4 on 17-18 January 2024 by BR. In line with recommendations of [H. Zhang et al. \(2023\)](#) we initially used emergent theme analysis within

ChatGPT4 to generate separate analyses for each of the interview questions, followed by a range of prompts to position these themes with respective interviewees, which afterwards were sense-checked independently by three authors (BR, CH, FT). Themes were subsequently merged and grouped together where feasible by the three authors. These data were used to develop the online follow-up survey, whereby the participants could check and validate whether the emergent themes resonated with them (or not). SPSS 27 was used for the online survey results. This research received Human Ethics Research Approval (HREC/ 2023-0183-4). Participants were free to participate and withdraw their written consent at any time. No consent was withdrawn.

Results

Results from the interview: expected services from AIDA according to students

In stage 1 after watching the visual artefact of a potential AIDA, the initial feelings and thoughts of the ten participants were explored. In general, most participants were surprised and intrigued that such an AIDA would work, in particular as towards the end of the screenshare JD indicated that the digital avatar was not a recording of him but an AIDA. Nine out of ten participants indicated that an AIDA would be useful for their studies, in different ways as indicated below, while one participant (I10) could see it being using for students with disability/support needs.

Four main emergent themes were identified that students would find useful for their teaching and learning. In terms of the most mentioned service by participants, which we label as *real-time assistance and query resolution*, most participants expressed the support for the idea of having 24/7 support from an AIDA for academic queries and guidance. For example, I09 indicated that such an AIDA could provide 24/7 real-time support when she needs it.

I think 24/7 support would be good because we all work at very different times. And what I would be expecting is related to the course material. So, if I had a question on “where would I find information on the [X]”, [AIDA] would give me links to where I could find this information, so that I'm not going at the tutor all the time and saying where can I find this? (I09, 17:36)

Also, I01 indicated that immediate feedback would be helpful to find appropriate resources and get more course relevant information.

One benefit is you have immediate questions and response. I would see this go a little bit further. Like when you ask a question to search something from the university, it'll be helpful if within the results, instead of just having a plain explanation, to point out where I can find more details about this question. (I01, 11:08)

At the same time, I09 indicated that there needed to be a balance between guidance and directly giving the “correct” answer.

It's just making sure that we've got a grasp of what we're learning. It's a difficult balance to get that kind of support without specifically giving out answers, because I know the AI won't tell you the answer to the question, it is pointing to the right direction as what I'm looking for. Not giving me the answers, just putting you in the right direction, that sometimes that's all you need. (I09, 18:36)

In terms of the second most expected service, which we label as *support for academic tasks*, most participants were positive that AIDA could support them with specific academic activities, such as providing summaries of main points from study materials, providing feedback on learning activities, language support, and offering suggestions for (additional) study materials. Beyond finding resources on academic progress, I03 would like the AIDA to provide some academic language support.

The very first basic service that I would like to have is finding sources, the other one, and to me this is one of my main usages of AI, I'm not a native and English speaker, writing documentation, even for my work, sometimes looking at essays, I'm really not 100% confident about my grammar. I would like the AI to tell me what I'm doing wrong, and how can I do better (I03, 16:55).

In terms of support for academic tasks around half of the participants were wondering whether such AIDA could support multiple languages. As three participants (I01, I03 I06) were international students and non-native English speakers, they found it useful having an AIDA that would work in different languages. Preliminary evidence shows that Gen AI approaches could be useful for language acquisition of non-native English speakers ([Klímová & Ibna Seraj, 2023](#)). At the same time, some like I09, who is a native English speaker but from a particular region in the UK, was worried about whether or not AI would pick up her respective accent.

At the same time, I03 would see the AIDA as an assistant, not a replacement of a human tutor.

I would love this to be like an assistant, not the teacher. Sometimes I have some questions that I would like to verify with the teacher. I understand the teacher sometimes is busy, they cannot answer a question right away. I do not want the AI to replace the tutor but be an assistant and sometimes help me to refine information but do not block me to talk with the tutor. (I03, 18:22)

Other academic support included the opportunity to quiz oneself, as for example indicated by I05, I06 and I07:

Sometimes it is tricky for me to revise, like I don't know exactly what's the best way how to do it, like flash cards, or I don't know, talking with other people, but it's not as interactive, just doing it by myself, I feel it's a bit tricky sometimes. (I06, 9:09)

I actually wish that existed right now. I'm really struggling with my coursework and I don't know where I'm going wrong and there are always seems to be almost loops that I miss. (I07, 7,59)

The third expected service of *personalization and accessibility* referred to participants expressing a desire for AI to be personalized to their own individual needs and learning approach, including those with accessibility needs. I06, for example, indicated that students might have different study motivations, and for her it would be useful to get support of what she knew and what knowledge gaps might still remain.

Finding out gaps in my study because technically you could fly through the Open University, missing huge chunks of information, but you just have to say the right stuff. If you're just in it for the degree, good for you, but if you are in it to learn and gain knowledge and expand your understanding of your certain subjects, you need to have someone to tell you what you don't know... I'm just annoyed that [AIDA] doesn't exist right now.” (I06, 13:24)

Others indicated that AI could provide personalized support for students in need.

In terms of student support and thinking about this being available 24/7, I could imagine AI might be quite handy for some students. That's stressing out in the middle of the night, and they can't find stuff about the deadlines and submissions, or how you meant to format a document and stuff like that, or who do they contact if a student breaks down. (I10, 19:13)

In terms of the fourth and final service of *emotional and social support*, a mixed perspective emerged about the potential of AI to offer emotional support or motivation. Some like I05, I06 and I07 thought that such service from an AIDA could be helpful in some circumstances. For example, I07 did not mention emotional and social support initially, but when she was prompted by the interviewer based upon what some other students indicated, this did resonate with her as she lived remotely:

I think [emotional and social support] would be great. I know there are a lot of people who study with the Open University because they are very anxious in social situations, or they just can't be around huge groups of people, so [the Open University] is the choice for them. Or maybe they just live in a very kind of rural area and the cost of going to a “bricks-and-mortars” university like having to travel on the train everyday, or rent a house somewhere. It's not worth it so than you're pretty isolated. (I07, 15:54)

At the same time, some argued that there is a limit in terms of what AI might do to provide emotional and social support.

I think there has to be a limit of support socially or emotionally [be]cause if someone really needs like professional help I don't think AI is capable, right now, to give that, and it's good to actually talk and to be with other people. (I06, 20:31)

Results from the interview: potential concerns of AIDA according to students

In terms of potential concerns of making AIDA available to students five themes emerged from the interviews. Most participants were concerned about the *ethical and social implications* of implementing AIDA, that is the potential impact of AI on learning processes, and the necessity of balancing technological advancement with human-centric educational practices, and keeping the human (student/tutor/academic staff) in the process and “being able to talk” to a human. Participants expressed a desire for the AI to assist, not replace, human interaction in distance education, including an appropriate balance between AIDA and human tutoring ([Hamilton et al., 2023](#); [Iniesto et al., 2023](#)). For example, I01 and I03 indicated the negative potentials of AIDA of replacing human tutors:

The tutor should be always present at some point, like if I need to contact for a specific reason I should be able to do that. (I01, 15:32)

My biggest concern with all the usage of the AI and also how much we are looking to the AI as a tool that can really help us not as a tool that is just replacing humans... Talking with a computer but believing I am talking with a human, I think it is very concerning. (I03: 10:28)

Others like I05 and I06 had a different perspective and were mostly positive about the affordances of AIDA, and having 24/7 access to a personalized AI tutor, but they did express concerns that it might lead to an overreliance of AI rather than human support.

In terms of the second most explored concern by participants, *data privacy and data use*, in line with wider literature, participants were worried about their privacy ([Korir et al., 2023](#); [Scott,](#)

[2023](#); [Yan et al., 2023](#); [H. Zhang et al., 2023](#)), the engrained potential biases in AI ([Bond et al., 2024](#); [Tao et al., 2023](#); [W. Zhang et al., 2023](#)), and its potential impact on diverse student populations ([Baker et al., 2023](#); [Nguyen et al., 2020](#)). Some participants like I03 indicated that they would be worried their data being used for training an AIDA system, and what would happen with their data. For example, I08 expressed concerns about who owns the data submitted to an AIDA.

If the Open University was to have a teaching assistant where I was plugging in my work and getting an output, like who owns that? And is that used to train the model? I see companies now coming out with “you can pay to not have that data used to train the model and vice versa”, but you know, is that a good thing or is that a bad thing? (I08)

As already reported widely in the media and literature, Gen AI systems could start to hallucinate and generate incorrect or biased answers ([Hamilton et al., 2023](#); [H. Zhang et al., 2023](#)). In total two participants mentioned this unprompted (I03, I08).

The level of hallucinations that an AI tool creates. I was reading what ChatGPT was saying, and it was like, OK, this is clearly wrong! If I was not trained on this, I would believe you're right, and this is really concerning because it can spread wrong knowledge (I03, 13:01)

The third theme related to *operational challenges* of implementing such an AIDA, as AI might inadvertently affect learning processes and student interactions, and making sure that the AI tools are accurate and reliable. Some participants like I03 and I08 expressed a need to be very clear when information provided to students came from AI. Linked to this point, given the wide range of disciplines and topics supported in the Open University, I08 was worried about how AIDA would be able to cover the wide range of disciplines.

I think that's a risk as well, with the broad amount of subjects and teachers at the the Open University, to make sure it's correct 100% of the time I imagine it would be a big challenge and would be worrying [the AIDA research team]. (I08, 26:23)

A fourth theme centered around *academic integrity*, and potential misuse of AI by students for completing assignments and potential plagiarism. For example, I07 indicate that AI systems could be trained with incorrect data from students.

But what if your work is rubbish? Would that not like battle [for] influence? The AI then would go teaching incorrect information to other people? (I07, 25:55)

IO9 expressed that she was worried about plagiarism when using AI, and not being able to learn.

I don't play with them because I'm very conscious of plagiarism and all, and I know they're designed to do that. But the work supposed to be mine and I'm not learning if it's not my work. (IO9, 14:11)

Finally, some participants were concerned about the *future of education*, and how AI integration might change the nature of education and assessments, necessitating a shift in teaching methods and learning expectations. For example, IO8 indicated some potential long-term impacts of AI that might influence how companies might look for economic efficiencies by replacing humans with AI, and what the impact might be on his children.

I'm someone who worked as a financial controller for many years, and you start to automatically look for financial efficiencies. Could you replace people with essentially avatars and chat bots? Which is scary! [A] lot of people would need retraining and a lot of different things, which does worry me. I think about my children and what kind of world they need to train for when they are older. (IO8, 24:44)

Online survey outcomes

The second stage of our data collection consisted of a follow-up survey two weeks after the interviews, whereby in total 8 out of 10 participants responded in January 2024. Participants had the opportunity to reflect on their own perspectives and those from other participants, as well as add any new elements that were not discussed during their interview. At the start of the survey, participants were asked whether they would like an AIDA for their studies as demonstrated by JD. 5 out of 8 participants agreed with this statement (3 indicated totally agree), two were neutral, and one totally disagreed.

In terms of the types of services that participants would like AIDA to have, as indicated in Table 2 the most popular was *real-time assistance and query resolution*, followed by *personalization and accessibility*, and *support for academic tasks*. While there was substantial support by most participants for these three services, only 4 out of 8 participants agreed that having *emotional and social support* should be a feature of AIDA, 2 were neutral, and 2 disagreed.

➔ Insert Table 2 about here.

In terms of additional qualitative feedback provided by participants, for example I07 indicated that this would be a useful addition to her studies: “I think all the points are very valid and relevant tools to improving students’ studies”. (I07)

I08 agreed but he was worried about the emotional and social support.

I think the AI digital assistant has many great use cases, mainly the first three that are listed above. However, I do not feel that [AIDA] should be available as an emotional or psychological support, there are too many undefined risks surrounding this. Including human attachment to a non-physiological form and the risk of a student suffering from emotional distress not meeting with other humans. (I08)

I05 also indicated that she would see value for all four AI features, but that she would not need them for her studies as she is already an experienced learner.

I have chosen ‘totally agree’ for the areas I’d most likely use and ‘agree’ for those I think would be great for others, but I personally don’t feel I’d need as much. (I05)

In contrast, I10 remained skeptical whether such an AIDA would be useful for her studies.

I support life-long learning and using the human brain. This just sounds like another form of social control. (I10)

In terms of the potential concerns of using AI in education, as indicated in Table 3 participants were most worried about *Academic Integrity*, *Operational challenges*, and *Ethical and social implications* of AI. 7 out of 8 were worried around potential misuse of AI for completing assignments and potential plagiarism, and similarly participants were worried about the operational issues of using AI. Furthermore, 6 out of 8 were worried that AI might have an impact on learning processes and the role of human contact in teaching and learning.

➔ Insert Table 3.

Finally, using the adapted items by [Iniesto et al. \(2023\)](#) to gain quantifiable feedback on the demoed AIDA experience, as indicated in Table 4 participants were in general most positive in terms of their intended use and ease of use of AIDA. Six out of eight thought that AIDA would be easy to use based upon what was demoed, while five out of eight indicated that they would use AIDA frequently if it would be available to them. Only two participants were worried that their data would be shared by

others, or used for external sources, such as training ChatGPT. Only one participant thought that the demoed AIDA seemed to be complex to use. Obviously, it would be difficult to generalise these findings as participants were only able to view a demo rather than engage with it, but nonetheless as expressed both in the interviews as well as the follow-up survey most participants were mostly positive about the functionality and the opportunities to support their learning.

→ Insert Table 4 about here.

Discussion

With the rapid evolution of Gen AI many distance learning institutions are exploring how to effectively support their students ([Bozkurt & Sharma, 2023](#); [Fariani et al., 2023](#); [Kasneci et al., 2023](#); [Yan et al., 2023](#)). Specifically with the Bloom dream of providing one-to-one personalized learning opportunities to increase student attainment using Gen AI, there are a lot of expectations around AI providing appropriate personalized learning at scale in the near future ([Bond et al., 2024](#); [D'Mello & Graesser, 2023](#)).

In this mixed methods two-stage sequential study, using a Voice of the Customer approach ([Freeman & Radziwill, 2018](#)) we demonstrated a possible AI Digital Assistant (AIDA) to ten distance learners at a large distance learning provider with detailed interviews and a follow-up online survey to validate their responses. Four expected services were identified that distance learning students would find useful for their teaching and learning: 1) real-time assistance and query resolution; 2) support for academic tasks; 3) personalization and accessibility; 4) emotional and social support.

Most participants were expecting to get 24/7 support from an AIDA for academic queries and guidance, in line with [Bozkurt and Sharma \(2023\)](#). In particular participants were expecting that AIDA would provide immediate feedback on their knowledge and skills ([Bond et al., 2024](#); [Zawacki-Richter et al., 2019](#)), and find appropriate resources and course relevant information where needed ([Crompton & Burke, 2023](#); [D'Mello & Graesser, 2023](#)). At the same time, several participants indicated that there needed to be a balance between AIDA providing guidance and directly giving the “correct” answer ([Darvishi et al., 2024](#)). Most participants were positive that AIDA could support providing summaries of main points from study materials, providing feedback on learning activities, and language support. Furthermore, participants expressed a desire for AI to be personalized to their own individual needs and learning approaches, including those with accessibility needs ([Fariani et al., 2023](#); [Iniesto et al., 2023](#)).

Finally, there were mixed expectations in terms of emotional and social support, whereby some students absolutely would embrace such service, while other were completely against the Open University considering this at all. In particular, in distance learning contexts where there is often social isolation due to the distance learning provision ([Chaka, 2023](#)), as well as a large group of students specifically choosing to study at their university because of their accessibility needs ([Iniesto](#)

[et al., 2023](#)), this service in particular would require both more attention as well as careful consideration whether (or not) this might be a desirable feature.

Regarding concerns, most participants expressed worries about the ethical and social impacts of AI in education, stressing that its role should enhance, not substitute, human interaction. They highlighted the risk of AI promoting biased perspectives and the issue of overreliance on technology, which could diminish the importance of human support and interaction ([Bond et al., 2024](#); [Tao et al., 2023](#); [W. Zhang et al., 2023](#)). Concerns about the dissemination of incorrect information and the potential adverse effects on diverse groups were also highlighted ([Baker et al., 2023](#); [Nguyen et al., 2020](#); [Rizvi et al., 2022](#)). Additionally, participants expressed concerns around data privacy, how personal information would be used in AI systems, and issues of data and intellectual property ownership ([Korir et al., 2023](#); [Yan et al., 2023](#); [H. Zhang et al., 2023](#)). This is particularly relevant for distance learning contexts as students mostly learn online, and therefore their activities and behaviors online are more traceable relative to on-campus students. Following these points, operational challenges and academic integrity concerns seamlessly emerged, emphasizing the critical need for AI's reliability and highlighting the risks associated with its misuse in education. Finally, participants also discussed the impact of AI on the future of education, particularly focusing on the potential impact on teaching methods and critical thinking.

A unique contribution of this study was the VoC approach, whereby we have focused on distance students from a range of ages, academic progression, disciplines, experience, and levels of study. Another unique contribution was the fact that most participants had already extensive professional experience, thereby providing more complex and perhaps comprehensive perspectives beyond “just getting a degree”. In particular, the narratives around the future of education and whether or not higher educational institutions should be critical towards AI adoption require substantial attention, in line with recommendations by [Hamilton et al. \(2023\)](#).

Limitations and future research

A main limitation was the relatively small sample of this study. However, we reached saturation in terms of the themes that emerged after eight participants, and given the validation of the subsequent results in stage two by the participants there was consensus amongst most participants in terms of the expected services of AIDA and its potential concerns. In future research, in line with design-based research principles ([Qiu et al., 2024](#)) we would like to explore how initial prototypes of AIDA are perceived by students, educators, and managers. In particular given the wide range of students at the Open University we need to explore whether students with particular accessibility needs, demographic, educational and socio-economic backgrounds might have specific and perhaps unique user requirements and whether specific groups benefit more than others (as we have found for our Learning Analytics tool). Similarly, in terms of educators we need to ensure that we carefully balance

their autonomy with appropriate ways to support their teaching practice with AIDA where feasible. This would help to develop inclusive and transparent mechanisms and policies with all stakeholders involved to ensuring that any future approaches incorporating AIDA are appropriate for the diverse range of students and educators at the Open University, and beyond.

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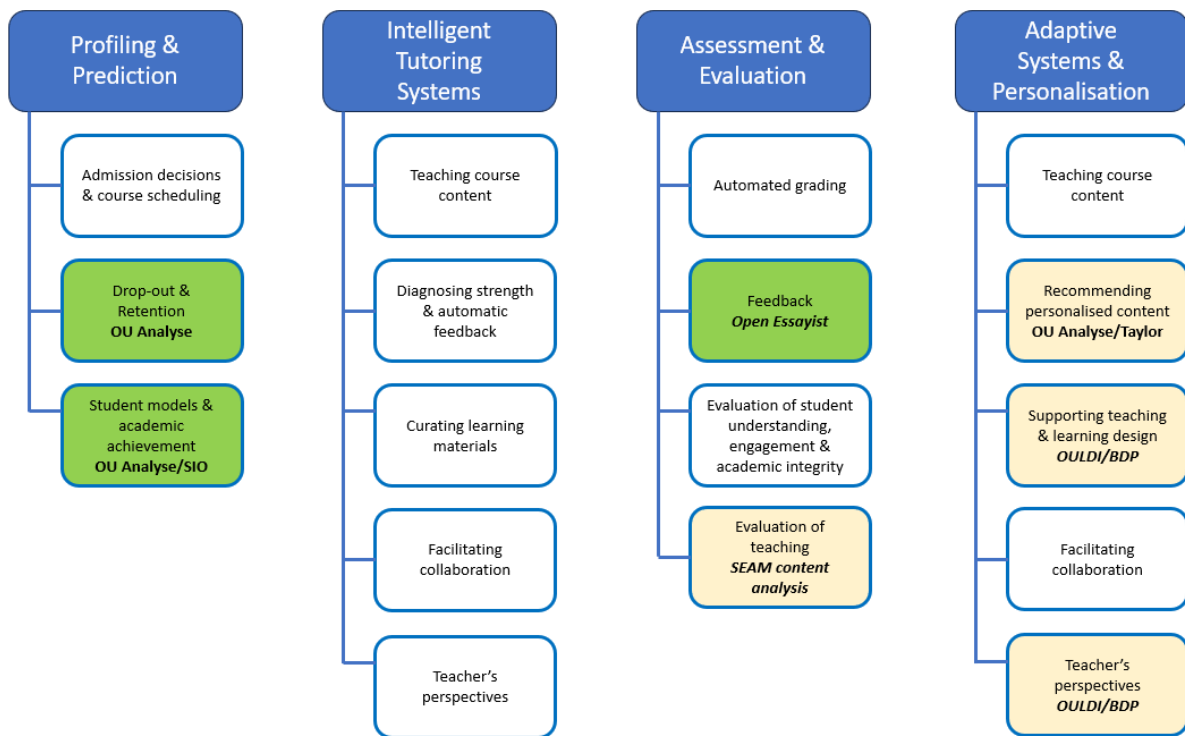
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Figure 1 [Zawacki-Richter et al. \(2019\)](#) original AIED typology and use of AI in The Open University



Adapted from [Zawacki-Richter et al. \(2019\)](#).

Note: Green color denotes strong evidence of impact of AI use in The Open University. Yellow indicates some emerging evidence of AI use in The Open University. White color indicates limited or no initiatives at the moment.

Table 1 Participants of the study (ordered by discipline and age)

P	Gender	Age	Discipline	New or continuing	Level of study	#Completed courses	Occupational status	Previous education
I03	Male	30-39	Arts/Social Sciences	Cont.	2	3	Full time employed	3 A Lev
I07	Female	40-49	Business	Cont.	2	3		3 A Lev
I10	Female	50-59	Business	Cont.	PG	10	Unable to work	5 PG Qual
I09	Female	40-49	Education	Cont.	3	4	Full time employed	4 HE Qual
I05	Female	50-59	Education	Cont.	3	3	Part-time	2 Less than A
I06	Female	20-29	STEM	New	1	0	Unemployed	3 A Lev
I01	Male	30-39	STEM	New	1	0	Full time employed	4 HE Qual
I04	Male	30-39	STEM	New	PG	0	Full time employed	4 HE Qual
I08	Male	30-39	STEM	New	1	0	Full time employed	4 HE Qual
I02	Female	60-69	STEM	Cont.	1	8	Retired	5 PG Qual

Table 2 Four services that students expect an AI digital assistant to have for teaching and learning

	Mean	SD	% agree
<i>Real-time Assistance and Query Resolution:</i> Having 24/7 support from AI digital assistant for academic queries and guidance	4.25	1.04	87
<i>Personalisation and Accessibility:</i> AIDA to be personalised to individual needs and learning approaches, including those with disabilities or specific learning requirements.	4.13	1.48	75
<i>Support for Academic Tasks:</i> AI assisting with academic activities like summarising key points from study materials, providing feedback on assignments, helping with grammar and writing, and offering study resources.	3.88	1.12	62
<i>Emotional and Social Support:</i> AIDA provides emotional support or motivation if needed, especially in the context of distance learning or for students with social anxieties.	3.25	1.28	50

n = 8, $\alpha = 0.686$.

Table 3 Concerns about use of AI in education

	Mean	SD	% agree
<i>Academic Integrity</i> : potential misuse of AI for completing assignments, potential plagiarism, and academic integrity	4.38	0.74	87
<i>Operational challenges</i> : how AI might inadvertently affect learning outcomes and student interaction, and the importance of ensuring that AI tools are accurate and reliable	4.25	0.71	87
<i>Ethical and social implications</i> : the potential impact of AI on learning processes and the necessity of balancing technological advancement with human-centric educational practices, keeping the human (student/tutor/academic staff) in the process, being able to talk to a human	4.13	0.84	75
<i>Data privacy and use</i> : how student data and inputs to the AI are used, stored, and potentially shared, emphasising the need for transparency and consent	4.13	0.84	75
<i>Future of education</i> : how AI integration might change the nature of education and assessments, necessitating a shift in teaching methods and learning expectations	4.00	0.76	75

n = 8, $\alpha = 0.687$.

Table 4 Potential usability of demoed AI digital assistant (Likert response scale 1-5)

	Mean	SD	% agree
I think the Institution X AI digital assistant will be easy to use	3.75	0.47	75.0
I think that I would like to use such Institution X AI digital assistant frequently	3.75	1.04	62.5
I would imagine that most people would learn to use the Institution X AI digital assistant very quickly	3.75	0.47	50.0
I am hoping to use the Institution X AI digital assistant to test the quality of summative assessment and feedback	3.00	1.41	62.5
I am worried that my work and conversations with the Institution X AI digital assistant will be shared with others	2.88	1.24	50.0
I am hoping to use the Institution X AI digital assistant to test my draft submissions before a respective assessment deadline	2.87	1.46	50.0
I am worried that my work and conversations with the Institution X AI digital assistant will be shared with external sources (for example to train ChatGPT)	2.87	1.13	12.5
I found the Institution X AI digital assistant unnecessarily complex	2.38	0.92	12.5
I think that I would need the support of a technical person to be able to use the Institution X AI digital assistant	2.13	0.84	12.5

n = 8, $\alpha = .702$