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Article

Students' Perceptions of AI Digital Assistants (AIDAs): Should Institutions Invest in Their Own AIDAs?

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Abstract: This mixed methods study explores 315 distance learning students' perceptions of artificial intelligence digital assistants (AIDAs) over an 11-month period in three distinct studies. The research investigates student perspectives on both a publicly available AI digital assistant (p-AIDA), such as ChatGPT, and a potential institutionally developed AI digital assistant (i-AIDA). Findings indicate that students highly valued 24/7 immediate academic feedback and the personalisation of the i-AIDA, and these perspectives remained largely stable across the three studies. However, concerns about academic integrity, data privacy, and ethical implications persisted across the studies. A cluster analysis identified three distinct student groups of highly critical, supportive, and keenly supportive learners, with key differences based on prior GenAI experience, educational background, and age. This study underscores both the potential and challenges of developing institutional AI solutions to enhance student learning while addressing privacy and ethical concerns.

Keywords: artificial intelligence; generative AI; digital assistant; public vs. institutional AI; student expectations; distance learning



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1. Introduction

Since the launch of ChatGPT there is considerable enthusiasm and anticipation expressed in terms of using Generative AI (GenAI) in teaching and learning [1–7], and recent evidence suggest that many students use GenAI for education. For example, a large-scale global study with 23,218 students in over 100 countries by Ravšelj et al. [8] found that 71% of respondents had already used GPT, and of those 69% indicated that it could improve their general knowledge. Most commonly, ChatGPT as an AI digital assistant was primarily used for brainstorming (29%), summarizing (27%), and research assistance (25%) [8]. Indeed, a recent study by Freeman [9] showed that UK students' adoption of GenAI for assessments increased from 53% in 2024 to 88% in 2025.

There is some emerging experimental evidence that GenAI can enhance student learning processes and outcomes. For example, a recent systematic literature review of 69 experimental studies (58 at university level) by Deng et al. [10] found improved academic performance, better affective-motivational states, and higher-order thinking propensities of students using ChatGPT relative to not using ChatGPT.

Nonetheless, there are several studies that highlight concerns about GenAI too [3,4,11–13]. For example, a recent study conducted at four Australian universities consisting of 8028 students indicated that while 83% of students used GenAI for their studies a majority of students were sceptical (56%) or even worried about using GenAI (47%) [12]. Similarly, in a Spanish study amongst 100 younger students, 49% raised significant concerns around

GenAI [13]. Indeed, there is some emerging evidence that several groups of students are worried about what happens to their data when using a public AI digital assistant (p-AIDA) like ChatGPT [8,14,15], where students expressed concerns around ethical and social implications, academic integrity and misuse, data privacy and data use [12,15].

This might be particularly pertinent for distance learners who are primarily engaging online with other learners and institutional materials. A wealth of studies have shown that distance learning students often have lower retention rates relative to face-to-face students, and may benefit from having personal and timely support and guidance [15,16]. At the same time, distance learning institutions might be hesitant to share their body of knowledge and learning materials with GenAI companies [17]. Furthermore, in comparison to face-to-face or hybrid institutions, these distance learning institutions gather a great deal of sensitive data about the learning characteristics and engagement of their learners [16].

One possible approach to addressing these concerns is for distance learning institutions to develop their own institutional AI digital assistant (i-AIDA) within a ‘walled garden’ framework, and/or integrate i-AIDA with existing systems using APIs in Large Language Models (LLMs). This would allow students and educators to securely use, trust, and share their data and IP (e.g., course materials, assessments, and marking criteria), thereby potentially limiting prior concerns regarding the quality of i-AIDA responses and related privacy issues.

Therefore, in this trend study, we explored the views of 315 distance learning students over three distinct studies about whether (or not) the Open University (OU) should be developing an i-AIDA as opposed to using an off-the-shelf p-AIDA. To the best of our knowledge, this is the first study that looked over a period of 11 months whether students’ perspectives on an i-AIDA vs. p-AIDA might change as they gain more experience with GenAI tools like ChatGPT. Therefore, the following research questions were posited:

RQ1: What are distance learning students’ perspectives of i-AIDA relative to using a p-AIDA, and do they change over time as students gain more experience with AI?

As there are several studies [18–20] that have indicated that there might be clusters of students who have distinct preferences for technologies based upon their demographics and/or learning experiences, as a second research question, we were particularly interested in exploring whether particular subgroups of distance learners were present.

RQ2: To what extent are there particular subgroups of distance learners who have similar or distinctive perspectives on i-AIDA, and how are these related to individual characteristics?

2. Materials and Methods

2.1. Setting and Instruments

The three mixed methods and interlinked studies were conducted at the OU over a period of 11 months between December 2023 and November 2024 with a total of 315 students. As described in [15], in Study 1, ten students were introduced to a potential version of i-AIDA at the beginning of their interview in December 2023–January 2024. Based upon the interviews, four broad services from AIDAs, five concerns about using AIDAs, and five reasons why an i-AIDA would be preferred over a p-AIDA like ChatGPT were identified by the research team. Subsequently, we developed an initial online survey instrument [15,21,22] and asked participants in Study 1 to rate these elements one week after the interview.

Based upon Study 1, an online survey was developed in conjunction with an instrument by Freeman [23] for Study 2 [21,22]. The i-AIDA survey consisted of 25 Likert-response

questions (1 = Totally disagree to 5 = Totally agree) and 15 check-box items for GenAI usage, as well as 5 open questions. Building on Study 1, participants in Studies 2–3 were first asked about their experiences with using AI tools in general, and GenAI tools in their education in particular [15,22]. Participants in Study 2 were briefly informed about the results from Study 1 and how four main services were identified by students in Study 1 in terms of an i-AIDA (but not their relative ratings). Subsequently, participants were asked about six potential reasons why the provision of such an i-AIDA relative to publicly available AI systems might be beneficial for studying at the OU. Afterwards, five broad concerns of an i-AIDA raised in Study 1 were shared with participants in Study 2.

Study 3 was conducted in November 2024 with 211 students, using the same instrument as in Study 2. As we used the insights from Study 1 and Study 2 to further refine the design of the i-AIDA, participants in Study 3 were shown screenshots of a possible i-AIDA (Figure 1) as well as dialogue with the i-AIDA (Figure 2) from the feedback of those 106 participants in Studies 1–2. In Table 1, we provide an overview of the three studies, and how they built on each other. For this paper, we included new unpublished data from Study 3 and substantially extended the quantitative analysis (see Section 2.2).

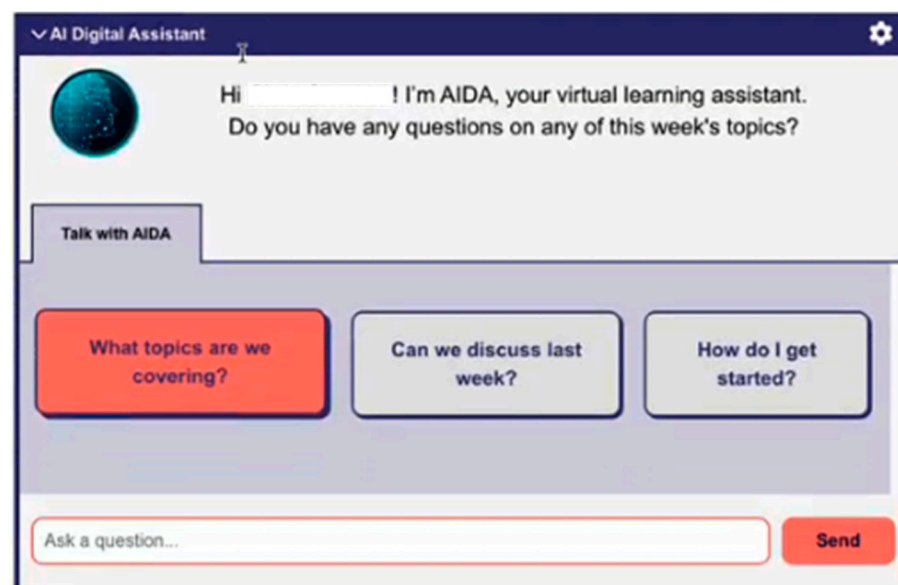


Figure 1. Screenshot of i-AIDA in Study 3.

Table 1. Overview of three studies.

	Study 1	Study 2	Study 3
Participants	10	96	211
Instrument	Online demo and interview Follow-up online survey 18 Likert-response questions [15] 5 open questions	Online survey 25 Likert-response questions 15 check-box items for GenAI usage 5 open questions [21,22]	Same survey as in Study 2 with two screenshots of i-AIDA
Time of measurement	December 2023–February 2024	15 May–15 June 2024	November 2024
Female	60%	52%	63%
Age	40.00 (SD = 13.09)	52.30 (SD = 16.61)	45.84 (SD = 16.37)
Response rate	4%	5%	11%
Data previously reported in	[15]	[21,22]	New data

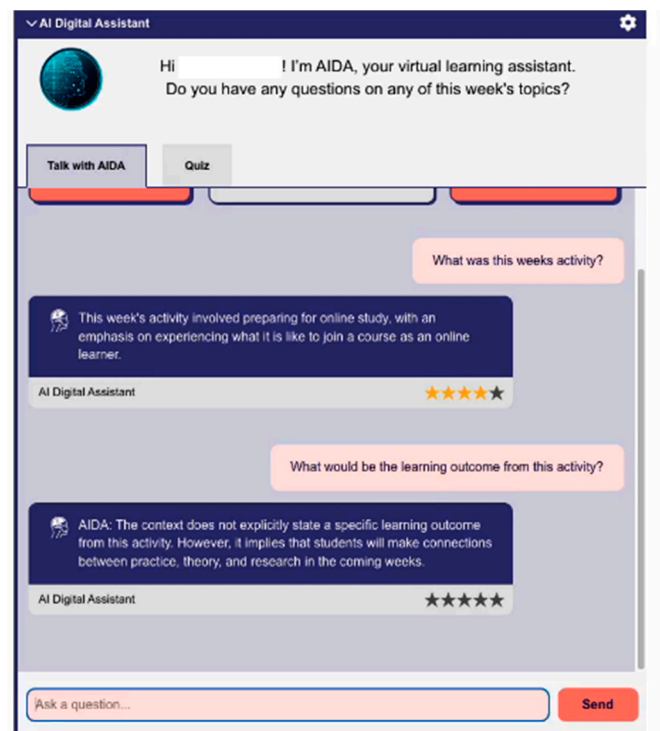


Figure 2. Screenshot of dialogue with i-AIDA in Study 3.

2.2. Procedure and Data Analysis

A team of 15 people in two units at the OU designed and evaluated the various versions and iterations of i-AIDA. The quantitative data were analysed in SPSS 29, whereby we conducted ANOVAs, Pearson correlations, and k-mean cluster analysis. The qualitative data from the surveys were analysed following Morgan [24], whereby we initially used emergent thematic analysis within ChatGPT4 to generate separate analyses. These themes were sense-checked and subsequently coded independently by a total of six authors (BR, DB, EC, FT, TC, and TU), with at least two authors per study. Cohen's Kappas between the two coders across the three studies ranged between 0.659 and 1, indicating good-to-perfect reliability. In this trend study, we afterwards identified quotes from the three cluster groupings that reflected some of their voices. Ethical approval for this research was granted by the Human Research Ethics Committee (HREC/2024 2024-0660-2). Participants received no compensation. Subsequent analyses using the initially sampled panel indicated no significant differences for those who were sampled and those who responded in terms of demographics and study programmes across the three studies.

3. Results

3.1. RQ1: What Are Distance Learning Students' Perspectives of i-AIDA Relative to Using a p-AIDA, and Do They Change over Time as Students Gain More Experience with AI?

Across the three studies 56.4% of students indicated that they would want to have an i-AIDA for their studies, 24.1% of students were neutral, and 19.7% of students disagreed with this statement. In the three studies, we specifically asked participants to self-identify through the following options: female ($n = 113$, 59.2%), male ($n = 68$, 21.5%), other ($n = 2$, 0.6%), or prefer not to say ($n = 8$, 2.5%). As indicated in Figure 3, no substantial differences were present across the three studies in terms of students' preferences for having an AIDA for their studies, nor were there any significant differences in terms of whether participants self-identified as female.

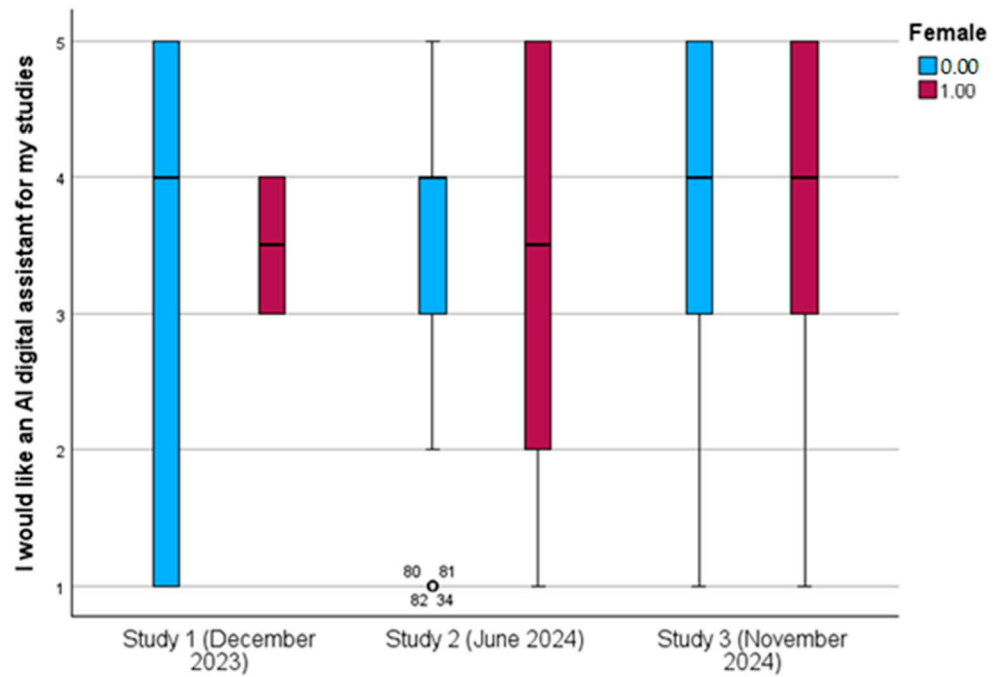


Figure 3. Students who would like an i-AIDA for their studies.

In order to further unpack this, we specifically wanted to understand what features an AIDA should have according to the students across the three studies. In terms of the most mentioned service by participants across the three studies, which we labelled as *personalisation and accessibility*, most participants expressed a desire that the AIDA would need to be personalised to their needs and learning approaches. Furthermore, most students wanted the AIDA to provide *real-time assistance and query resolution* for academic questions and guidance, as illustrated in Table 2.

Table 2. Four services that students anticipate an AI digital assistant should provide to support teaching and learning.

	Study 1		Study 2		Study 3		F-Value	Eta
	M	SD	M	SD	M	SD		
<i>Personalisation and Accessibility:</i> The AIDA is personalised to individual needs and learning approaches, including those with disabilities or specific learning requirements.	4.13	1.46	3.81	1.21	4.02	1.11	1.196	0.008
<i>Real-time Assistance and Query Resolution:</i> The AIDA provides 24/7 support for academic queries and guidance.	4.25	1.04	3.72	1.26	3.96	1.22	1.638	0.010
<i>Support for Academic Tasks:</i> The AIDA assists with academic activities like summarizing key points from study materials, providing feedback on assignments, helping with grammar and writing, and offering study resources.	3.88	1.13	3.35	1.40	3.60	1.44	1.245	0.008
<i>Emotional and Social Support:</i> The 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	2.95	1.33	3.36	1.39	2.982	0.019

Study 1, N = 8; Study 2, N = 96; Study 3, N = 212; $\alpha = 0.880$. Items from [15].

Similar patterns emerged from participants across the three studies where participants found it important that the AIDA would be personalised to their own needs and experiences in a 24/7 support manner. The *support for academic tasks* was the third most expected service by students, while there were more mixed expectations for *emotional and social support*. No significant differences were found using ANOVAs between the three studies on these four services, indicating that students on average had similar expectations of the AIDA, and that these did not change over time.

Five potential concerns about making an AIDA available to students were identified, as shown in Table 3: academic integrity, data privacy, operational challenges, ethical and social challenges, and future of education. Most participants were concerned about *academic integrity*, the potential misuse of AI by students for completing assignments, and potential plagiarism, which is in line with other recent survey studies [8,12]. The second highest concern was *data privacy and use*, and how data from students are used, stored, and shared. Across the three studies, participants had similar levels of concerns, and no significant differences using ANOVA were found across the three studies, indicating that similar trends emerged.

Table 3. Student concerns about the use of AI in teaching and learning.

	Study 1		Study 2		Study 3		F-Value	Eta
	M	SD	M	SD	M	SD		
<i>Academic Integrity</i> : potential misuse of AI for completing assignments, potential plagiarism, and academic integrity.	4.38	0.74	4.16	1.08	4.13	1.00	0.222	0.001
<i>Data Privacy and Use</i> : how student data and inputs to the AI are used, stored, and potentially shared, emphasizing the need for transparency and consent.	4.13	0.84	4.11	1.05	4.08	1.02	0.976	0.000
<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	4.03	0.99	4.05	0.93	0.199	0.001
<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, and being able to talk to a human.	4.13	0.84	4.13	1.05	4.05	1.06	0.831	0.001
<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	4.03	1.10	3.95	1.04	0.811	0.001

Study 1, N = 8; Study 2, N = 96; Study 3, N = 212; $\alpha = 0.872$. Items from [15].

Finally, as indicated in Table 4, most participants agreed with the six possible reasons, identified initially by participants in Study 1, why they should prefer an institutionally developed i-AIDA over a publicly available p-AIDA like ChatGPT. The most important reason according to the participants would be that an i-AIDA would be more *accurate and specific* as the content would be generated by the OU. Another important reason for

participants was that an i-AIDA would be available 24/7 and would provide immediate feedback in the academic setting of the learner, rather than providing generic content. Another important reason would be that an i-AIDA would be integrated in the students' learning experience, rather than being hosted elsewhere, and it would provide personalised responses based upon the learners' needs and their respective journey into the learning materials. Using ANOVAs, no significant differences were found across the three studies, indicating that participants across studies had similar preferences in terms of the reasons for preferring an i-AIDA over a p-AIDA.

Table 4. Reasons for preferring i-AIDA over p-AIDA (ordered by preference in Study 3).

	Study 1		Study 2		Study 3		F-Value	Eta
	M	SD	M	SD	M	SD		
<i>Accuracy and Specificity:</i> I value the accuracy in responses as it is based upon institutional curated content. It not only provides relevant answers but also directs students to specific resources for further learning.	4.13	0.99	3.72	1.27	4.01	1.17	2.209	0.013
<i>24/7 Availability and Immediate Feedback:</i> i-AIDA would be available round-the-clock for immediate feedback and support in an academic setting.	4.00	1.07	3.85	1.15	3.99	1.20	0.422	0.003
<i>User Experience and Interface Design:</i> i-AIDA would be easy to use, user-friendly, and integrated (e.g., in OU module websites).	4.25	1.04	3.81	1.19	3.96	1.22	0.444	0.005
<i>Language and Accessibility:</i> i-AIDA would be multi-lingual and accessible, catering to a diverse student body.	4.43	0.79	3.77	1.18	3.94	1.20	1.386	0.009
<i>Personalisation and Relevance:</i> i-AIDA would provide personalised responses, tailored to my academic needs and context, differentiating it from generic AI tools.	3.75	1.49	3.69	1.20	3.83	1.22	0.414	0.003

Study 1, N = 8; Study 2, N = 96; Study 3, N = 212; $\alpha = 0.957$. Items from [21].

3.2. RQ2 Distinct Subgroups of Students' Preferences Towards i-AIDA

In order to explore RQ2 whether there might be distinctive subgroups of students in terms of preferences for an i-AIDA, such as being new to the institution or being a continuing student, prior education levels, sex, age, and/or having previous GenAI experience in general and using GenAI for education, we ran K-means cluster analyses with two, three, and four cluster solutions, in line with [18]. A three-cluster solution had the best fit, and as indicated in Table 5, four individual characteristics distinguished the three clusters, namely, age, prior use of GenAI in general, use of GenAI in education in particular, and finally highest level of education.

Cluster 1 learners ($n = 41$) were *highly critical of i-AIDA*, and saw limited use for their studies. Relative to the other clusters, Cluster 1 learners hardly used GenAI in general (5%) and in education (2%), and had higher prior education levels relative to Cluster 3 learners (all significant using ANOVAs). These learners indicated the highest AI challenges and the least usefulness of AI for quizzes. While Cluster 1 learners were the smallest cluster, they were most critical towards AIDAs, and used words like “disgraceful” or “please do not do this”:

We are not paying for a computer to replace tutors. This is a joke and will end badly. Stop pushing this agenda on us. It’s a disgrace that my university, which I pay real money for, is lazily making itself worthless. (S3_057, Female, level 3, unknown discipline)

I thought university was about studying, researching, discovering things that matter to me and my way of learning. Not about asking a bot for answers or even a path to them. (S3_066, Male, level 1, Computing)

I think this is the future, but until AI improves and proves it can provide accurate results while considering different viewpoints—especially in humanities, where there isn’t just one correct answer—it is dumbing down degrees. (S3_110, Female, level 3, Arts and Humanities)

Table 5. ANOVA of K-means cluster analysis results.

	1 Highly Critical of i-AIDA		2 Supporters of i-AIDA		3 Keen Support. of i-AIDA		F-Value	Eta
	M	SD	M	SD	M	SD		
New or continuing student (1–2)	1.85	0.36	1.83	0.38	1.81	0.40	0.257	0.002
Highest level of education (1–5)	3.51	0.93	3.47	1.04	3.10	1.07	5.008 **	0.033
Age (18–80+)	45.10	17.70	62.80	10.30	37.60	11.60	140.175 ***	0.486
Female (0–1)	0.54	0.50	0.54	0.50	0.67	0.47	2.533	0.017
Use of GenAI in general (0–1, 6 items)	0.05	0.11	0.14	0.21	0.23	0.23	13.509 ***	0.083
Use of GenAI for educational purposes (0–1, 6)	0.02	0.06	0.09	0.19	0.16	0.20	11.160 ***	0.070
Want an AI digital assistant (real-time, personalised, academic tasks, emotional/social, 1–5, 4)	1.60	0.59	3.58	0.81	4.25	0.64	233.132 ***	0.611
Want an i-AIDA specifically developed by the OU relative to other systems (1–5, 6)	1.67	0.79	3.90	0.67	4.41	0.59	288.176 ***	0.660
AI challenges (1–5, 5)	4.31	1.12	4.17	0.67	3.92	0.84	5.023 **	0.033
AI for quizzes (1–5, 5)	1.79	0.91	3.89	0.75	4.33	0.67	191.746 ***	0.564

Cluster 1, $n = 41$; Cluster 2, $n = 109$, Cluster 3, $n = 150$; ** $p < 0.01$; *** $p < 0.001$. Range in brackets, and number of items followed if applicable.

The second largest group of Cluster 2 learners ($n = 109$) are labelled as *supporters of i-AIDA*, who mostly agreed that an (i-)AIDA would be useful for their studies. These learners were mostly older learners and were in between the two other clusters in terms of use of GenAI. While these learners identified several positive affordances, such as help with revisions and the ability to ask questions, they also shared some concerns about AIDAs, such as the impact of AIDAs on human interaction and the carbon footprint of using AIDAs.

It could allow me to see what I understand or not in the course, so I can revise/investigate the subject more in depth. It could be a good way to revise—but to do that, the questions need to be written clearly. (S2_80, Female, PG, Health and Social Care)

1. Where tutor-led tutorials don’t take place due to low attendance, an AI-generated email at the start of each study week could provide prompts, questions, or ideas to help students engage with the module materials. 2. It could refine plagiarism checks by disregarding references and essay questions to avoid skewing scores. It’s crucial to maintain real interactions with tutors to enhance learning through discussions and debates, rather than becoming overly reliant on AI. (S3_037, Female, level 1, Psychology)

An AI assistant could support students with time management difficulties, such as those with ADHD or executive functioning challenges, by prompting them to prepare for assignments or tutorials and notifying them of missed questions. It could also assist with referencing and transcription of dictation. AI has a high energy consumption, contributing to a significant carbon footprint. It’s important to be transparent about this, as many students are concerned about climate change. (S3_023, Female, level 1, Business)

Finally, the largest group of Cluster 3 learners ($n = 150$) were labelled as *keen supporters of i-AIDA*. In general, these learners were relatively younger in comparison to the other two clusters, had a lower prior education qualification on average (66% had A-levels or below relative to 53% of Cluster 1 and 43% of Cluster 2), but had substantially more prior experience with GenAI in general and in education in particular. It should be noted that a unique feature of the OU is that in most Bachelor courses, students do not need specific prior qualifications to start their studies.

AI could offer real-time feedback on coursework, helping identify areas for improvement before submission. It could also recommend resources based on study topics, supporting deeper exploration. . . Flexibility is key, especially for students balancing work, family, and studies. Data privacy is also crucial—students must feel secure when using AI in their studies. (S3_008, Male, level 1, Business)

To help and provide an on-track timetable based on recommended study speed and pace. To determinate if I’m one track to hit my assessment deadline at the pace I’m working at. (S3_061, Male, level 1, Computing)

Finally, in Table 6, the correlation matrix indicated that participants who had more (self-reported) prior experience with GenAI in general and GenAI in education in particular were, in general, more positive about AIDA ($\rho = 0.265$; $p < 0.01$) and i-AIDA in particular ($\rho = 0.280$; $p < 0.01$). Furthermore, those participants with more prior GenAI experience were less worried about some of the challenges of using AI, and, in general, were more likely to be continuing students ($\rho = 0.161$; $p < 0.05$), and younger in age ($\rho = -0.131$; $p < 0.05$).

Table 6. Correlation matrix of GenAI use, preference for (i-)AIDA, and demographics.

	M	SD	α	1	2	3	4	5	6	7	8	9	10	11
1. Use of GenAI in general	0.17	0.22	0.634											
2. Use of GenAI for educational purposes	0.12	0.19	0.686	0.484**										
3. Like an AI digital assistant for my studies	3.55	1.37	-	0.315**	0.359**									
4. Want an AI digital assistant (real-time, personalised, academic tasks, emotional/social)	3.65	1.11	0.877	0.265**	0.320**	0.779**								
5. Want an i-AIDA specifically developed by the OU relative to other systems	3.86	1.10	0.956	0.280**	0.300**	0.756**	0.891**							
6. AI challenges	4.06	0.84	0.873	-0.107	-0.077	-0.196**	-0.144*	-0.056						
7. AI for quizzes	3.83	1.11	0.932	0.266**	0.314**	0.733**	0.785**	0.789**	-0.091					
8. Comfortable with institution using my data	3.14	1.36	-	0.204**	0.264**	0.517**	0.520**	0.510**	-0.094	0.544**				
9. New or continuing student	1.83	0.38	-	0.161*	0.002	0.025	-0.047	-0.017	-0.052	-0.101	-0.077			
10 Highest level of education	3.29	1.06	-	-0.015	-0.014	-0.174**	-0.208**	-0.139*	0.161**	-0.177**	-0.144*	0.053		
11 Age	47.82	16.69	-	-0.131*	-0.109	-0.079	-0.096	-0.056	0.122*	-0.016	0.008	0.1	0.136*	
12. Female	0.59	0.49	-	-0.07	-0.101	0.045	0.09	0.097	-0.003	0.002	0.021	-0.061	-0.068	-0.154**

Pearson correlation. * $p < 0.05$; ** $p < 0.01$. $n = 304$.

Not surprisingly, participants who wanted an AIDA in general and an i-AIDA in particular were more inclined to see the positive benefits of AIDAs ($\rho = 0.756$; $p < 0.01$) and i-AIDAs ($\rho = 0.891$; $p < 0.01$) and their usefulness for quizzes ($\rho = 0.785$; $p < 0.01$), and were comfortable with the institution using their data for training ($\rho = 0.520$; $p < 0.01$). Participants with lower prior education qualifications were more positive about such AIDAs ($\rho = -0.174$; $p < 0.01$), but no correlations were found in terms of age and sex. Those participants who were more sceptical about AIDAs and primarily identified challenges on average had a higher level of prior education ($\rho = 0.161$; $p < 0.01$) and were older ($\rho = 0.122$; $p < 0.05$). This might indicate that demographics and prior education might influence students' willingness to use AIDAs.

4. Discussion

Many higher education institutions worldwide [1–3,7,11,13,14,23,25] are grappling with the challenges of integrating AI digital assistants into their teaching and learning frameworks. While publicly available AI digital assistants (p-AIDAs), such as ChatGPT, offer broad accessibility and functionality, there is increasing interest in developing institutional AI digital assistants (i-AIDAs) tailored to specific educational contexts. Therefore, in this trend study with 315 students over an eleven-month period, we explored their perspectives on such an i-AIDA, and what individual characteristics might influence these perspectives.

In addressing Research Question 1, findings across the three studies indicate that students maintain nuanced but similar perspectives on the role of AI in distance education, and that these perspectives did not change over a period of 11 months. While the majority (56.4%) expressed a preference for having an i-AIDA for their studies, a notable proportion remained neutral (24.1%) or disagreed (19.7%). This seemed to align with other studies conducted amongst younger students in Spain [13], as well as a larger study in over 100 countries conducted with 23,218 students by [8], although these studies only measured student perspectives at one time point. However, these results do seem different from the recent study by [9] who found that 92% of students at UK “traditional” universities now use GenAI for education in 2025 relative to 66% in 2024 [23]. One potential explanation might be our more specific focus on the types of services that distance learning students might expect from an i-AIDA rather than more general p-AIDA tool usage such as ChatGPT. Another potential reason might be that distance learning students, in general, might be older than traditional university students, whereby, linked to RQ2, we also found that the most keen group of i-AIDA supporters were relatively younger.

In addressing Research Question 2, the cluster analysis identified three student groups with distinct perspectives on i-AIDAs that were significantly different in terms of age, prior experience with GenAI, and wanting institutions like the OU implementing such i-AIDAs. We identified a highly critical group (older, with higher education levels and low GenAI usage) who were sceptical and outspokenly negative about i-AIDAs, fearing that AI might replace human interaction and their educational experience as distance learning students. The second cluster, who were supporters of i-AIDAs (primarily older learners, some with GenAI experience), saw benefits but also raised concerns about ethics and environmental impact. Finally, the third and largest keen supporter cluster (younger, with lower education levels and high GenAI experience) strongly favoured AI-driven personalisation, real-time feedback, and adaptive learning. These findings suggest that perspectives on i-AIDAs are shaped by age, education, and GenAI experience, reinforcing prior research [15,20] on technology adoption among different learner groups. Younger students with more GenAI exposure were more receptive to i-AIDAs, while older students with higher education levels tended to be more critical.

Despite these findings, institutional adoption of i-AIDAs depends on feasibility and cost-effectiveness, especially given the rapid development of p-AIDA tools. This trend study contributes to the ongoing debate on whether institutions should develop bespoke AI solutions, advocating for a cautious yet proactive approach that involves relevant stakeholders in the decision-making process.

5. Limitations and Future Research

A key limitation of this study was its reliance on self-reported data, as students reflected on a hypothetical i-AIDA rather than engaging with a fully implemented system in a real learning environment. While participants in Study 3 were shown screenshots and dialogues of a potential i-AIDA, they did not interact with a live version integrated into their studies. This raises questions about whether the key constructs identified remain relevant once an i-AIDA is operational. Additionally, while this study confirmed the stability of student perspectives over time, it remains unclear whether actual adoption rates would align with the stated preference of 56.4% of students.

Future research should explore pilot implementations of i-AIDAs to assess whether student expectations translate into actual usage patterns. Additionally, understanding educator and institutional perspectives on i-AIDAs are critical, as feasibility and acceptance by teaching staff will significantly influence its adoption. Further studies should also investigate how demographic factors, prior education levels, and GenAI experience shape attitudes toward AI in education. By engaging students, educators, and institutional leaders, future research can ensure that i-AIDA solutions are inclusive, ethical, and aligned with the needs of a diverse student population.

6. Conclusions

This mixed-methods trend study of three distinct studies provides a comprehensive analysis of distance learning students' perceptions of a potential AI digital assistant developed by the Open University over an 11-month period. Our findings demonstrate relatively stable student preferences for such an i-AIDA that delivers personalised, context-aware academic support, integrated within the students' learning environment. While a majority of participants expressed support for an i-AIDA, persistent concerns surrounding academic integrity, data governance, and ethical deployment underscore the need for a robust institutional framework. These findings underscore the imperative for higher education institutions to adopt a strategically phased approach to AI integration—balancing technological affordances with ethical safeguards, stakeholder engagement, and contextual sensitivity. Future work should prioritise real-world pilot deployments, multi-stakeholder evaluations, and longitudinal tracking to validate the anticipated educational value of i-AIDAs at scale.

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Abbreviations

The following abbreviations are used in this manuscript:

i-AIDA	Institutional AI digital assistant
p-AIDA	Public AI digital assistant such as ChatGPT
OU	The Open University UK
GenAI	Generative artificial intelligence

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