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Research Article

Effect Of Artificial Intelligence Usage On Students' Intellectual Ability At University Level

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ABSTRACT

The use of Artificial Intelligence (AI) in education can enhance students' intellectual ability by providing personalized learning experiences and fostering critical thinking skills. However, it also raises concerns about over-reliance on technology, potentially hindering independent problem-solving and creativity. The objectives of the study were to find out the level of Artificial Intelligence Usage and Students' Intellectual Ability, to analyze the relationship and effect of Artificial Intelligence Usage on Students' Intellectual Ability, and to find out the difference between public/private and male/female regarding Artificial Intelligence Usage and Students' Intellectual Ability at University Level. The design of the study is descriptive in nature. The philosophical paradigm of quantitative research is positivism. The population were comprised of all public and private universities of Lahore district. The instrument of the study were questionnaires. Validity of the instrument was tested through expert opinion while the reliability of the instrument was tested through pilot testing. Cronbach's Alpha was computed to assess the dependability of the tool. Primary source of data was in current research. The participants of this study were administering through questionnaires. Statistical package for social science (SPSS) was used for data analysis. Mean, and S.D. was used for 1st objective, pearson r for 2nd objective, Regression analysis were used for of 3rd objective, and independent sample t-test for 4th research objective. The findings of the study revealed that there was highly significant relationship and effect of Artificial Intelligence Usage on Students' Intellectual Ability at University Level.

Keywords: Artificial Intelligence Usage, Students' Intellectual Ability, University Level.

Introduction

The proliferation of Artificial Intelligence (AI) in education has redefined traditional learning paradigms, transforming the ways students acquire, process, and apply knowledge. From intelligent tutoring systems and adaptive learning platforms to generative AI tools like ChatGPT, AI is reshaping educational experiences worldwide. This transition has ignited debates among educators, policymakers, and researchers regarding its impact on students' intellectual abilities, encompassing critical thinking, problem-solving, creativity, and the capacity for independent reasoning. Understanding this influence is critical in determining whether AI serves as a catalyst for intellectual growth or an enabler of dependency and cognitive shortcuts. The rapid integration of AI technologies in classrooms has provided students with unprecedented access to personalized learning resources. Intelligent systems such as Khan Academy's AI-powered tools or Duolingo's language-learning platform adapt content delivery to individual learning paces and styles, facilitating tailored educational experiences (Holmes et al., 2021). These systems claim to enhance cognitive engagement by presenting students with appropriately challenging tasks, thereby fostering intellectual development (Zawacki-Richter et al., 2019). However, skeptics caution that over-reliance on such systems may undermine intrinsic motivation and the ability to engage in self-directed learning (Selwyn, 2020).

One of AI's most transformative impacts lies in its potential to democratize education. Students from underserved communities now have access to high-quality educational materials and experiences previously reserved for affluent institutions (Luckin et al., 2016). For instance, AI-driven learning platforms help bridge gaps in teacher availability and quality, enabling students to acquire foundational skills in mathematics,

science, and literacy (Means et al., 2020). This aspect is particularly crucial in developing regions, where teacher shortages and resource constraints hinder educational equity (Tondeur et al., 2017). However, critics argue that the effectiveness of these tools often hinges on the availability of technological infrastructure, thereby perpetuating existing inequalities (West, 2019). Beyond access, AI significantly influences how students interact with knowledge. Cognitive load theory suggests that reducing extraneous cognitive load through adaptive technologies enables learners to focus on deeper cognitive processes, such as analysis and synthesis (Paas et al., 2003). Tools like automated essay graders and problem-solving assistants streamline routine tasks, freeing cognitive resources for higher-order thinking (Baker et al., 2019). Yet, empirical evidence on whether this convenience translates into enhanced intellectual abilities remains mixed. For instance, Kirschner and De Bruyckere (2017) argue that while AI can support learning, it does not replace the need for deliberate practice and robust pedagogical design.

AI's impact on creativity and originality is another area of intense scrutiny. While tools like DALL·E and generative language models empower students to create content effortlessly, concerns persist about their effects on originality and critical thinking (Veletsianos et al., 2020). The ability to generate essays, solve equations, or compose art with minimal effort might lead students to bypass essential intellectual processes, such as ideation and iterative refinement (Perrotta et al., 2021). Conversely, advocates claim that these tools encourage exploration and experimentation by lowering barriers to entry, fostering a culture of innovation (Anderson, 2019). Moreover, the ethical implications of AI in education extend to the broader context of intellectual development. Issues such as algorithmic bias, data privacy, and the commodification of student data have profound implications for equity and trust in educational systems (Williamson & Eynon, 2020). For instance, biased algorithms may inadvertently reinforce stereotypes, limiting students' potential in subjects like STEM, particularly for underrepresented groups (Noble, 2018). Addressing these challenges is essential to ensuring that AI augments, rather than diminishes, the intellectual capabilities of diverse student populations.

AI also redefines the role of educators, transitioning them from knowledge dispensers to facilitators of critical inquiry and collaboration (Seldon, 2018). This shift necessitates the development of new pedagogical approaches that integrate AI effectively while preserving the humanistic elements of education (Woolf, 2020). Educators must balance the benefits of AI-driven efficiencies with the cultivation of intellectual virtues, such as curiosity, resilience, and ethical reasoning (Alexander, 2019). Without this balance, students risk becoming passive recipients of information rather than active constructors of knowledge (Duffy & Azevedo, 2015). While AI's benefits in enhancing intellectual ability are evident, its limitations underscore the need for critical engagement. For instance, studies reveal that students often exhibit superficial understanding when over-relying on AI-generated responses (Luckin & Holmes, 2021). This phenomenon, termed "cognitive offloading," raises questions about the sustainability of intellectual growth in AI-rich environments (Barr et al., 2015). Furthermore, the predictive capabilities of AI tools, such as early warning systems for academic performance, must be contextualized within holistic educational practices to avoid deterministic interpretations (Heffernan et al., 2018). The integration of AI into educational systems presents an opportunity to reimagine intellectual development. Yet, realizing its full potential requires a nuanced understanding of its impacts, informed by interdisciplinary research spanning cognitive science, educational psychology, and technology studies (Norris et al., 2012). As educators and policymakers grapple with these dynamics, the challenge lies in designing AI-driven learning environments that prioritize intellectual growth, equity, and ethical considerations (Selwyn, 2021). Ultimately, the goal is not merely to leverage AI as a tool for convenience but to harness its transformative potential to cultivate a generation of critical thinkers and lifelong learners.

The advent of Artificial Intelligence (AI) has introduced profound changes in the educational landscape, raising questions about its long-term implications on students' intellectual development. As AI-powered technologies continue to permeate classrooms and learning environments, they bring the promise of unprecedented personalization, accessibility, and efficiency. At the same time, these tools spark concerns about the potential erosion of critical cognitive skills and intellectual independence. Investigating the nuanced effects of AI on students' intellectual ability is essential for designing educational systems that balance technological advantages with developmental integrity. One of the primary ways AI is impacting education is through personalized learning. Unlike traditional one-size-fits-all approaches, AI-driven platforms analyze students' learning patterns, preferences, and progress to deliver customized content. Adaptive systems, such as DreamBox and Carnegie Learning, modify lesson difficulty based on real-time feedback, aiming to optimize individual learning trajectories (Luckin et al., 2016). This personalization not only caters to students with diverse learning needs but also supports engagement and motivation by providing appropriately challenging tasks (Zawacki-Richter et al., 2019). However, critics argue that these systems might inadvertently lead to a passive consumption of information, limiting opportunities for active problem-solving and intellectual struggle, which are critical for cognitive growth (Selwyn, 2020).

In addition to individual customization, AI has enhanced collaborative learning by connecting students across geographical and cultural boundaries. Virtual learning environments powered by AI, such as discussion forums and project-based platforms, enable global collaboration, fostering the exchange of diverse perspectives

(Veletsianos et al., 2020). These interactions cultivate higher-order thinking skills like critical analysis and synthesis, essential for intellectual development in the 21st century (Norris et al., 2012). However, the reliance on digital platforms raises questions about students' abilities to navigate and critically assess the quality of information in increasingly complex digital ecosystems (Williamson & Eynon, 2020). AI also plays a significant role in reshaping the way students develop creativity and innovation. Tools like generative AI applications, such as ChatGPT for text creation or DALL-E for visual content, lower barriers to creative expression by enabling students to produce sophisticated outputs with minimal effort. While this democratization of creativity is often celebrated, it raises concerns about its potential to shortcut the iterative processes of brainstorming and refining ideas, which are integral to fostering originality and intellectual resilience (Perrotta et al., 2021). Furthermore, the risk of plagiarism and the ethical use of AI-generated content pose challenges for educators tasked with nurturing intellectual honesty and accountability (Noble, 2018).

Beyond individual learning outcomes, the integration of AI in education influences how intellectual ability is measured and assessed. Traditional methods of evaluation, such as standardized tests, are increasingly being complemented by AI-driven analytics that track students' engagement, progress, and conceptual mastery. These tools enable more granular insights into students' strengths and weaknesses, allowing for targeted interventions (Heffernan et al., 2018). However, the accuracy and fairness of AI-based assessments depend on the quality of underlying algorithms and datasets, which can inadvertently perpetuate biases and inequalities (Tondeur et al., 2017). Equally important is the impact of AI on the role of teachers, who are pivotal in fostering intellectual curiosity and critical thinking. AI's ability to automate routine administrative tasks frees up educators to focus on higher-value activities, such as mentoring and designing inquiry-based learning experiences (Woolf, 2020). Nevertheless, the evolving teacher-AI dynamic calls for careful consideration of how educators can complement, rather than compete with, technology in cultivating students' intellectual potential (Seldon, 2018). Without adequate professional development and training, teachers may struggle to effectively integrate AI into their pedagogical practices, potentially widening the gap between technological capability and educational outcomes (Anderson, 2019). Finally, the ethical and psychological dimensions of AI use in education warrant attention. Issues such as data privacy, algorithmic transparency, and the psychological effects of AI-mediated learning on students' self-perception and agency are central to ongoing debates (Selwyn, 2021). For instance, studies suggest that while AI can support learning, it may inadvertently foster dependence, diminishing students' confidence in their problem-solving abilities (Barr et al., 2015). Addressing these challenges is crucial for ensuring that AI serves as a tool for intellectual empowerment rather than a substitute for human cognition.

Objectives

1- To find out the level of Artificial Intelligence Usage and Students' Intellectual Ability at University Level.
2- To analyze the effect of Artificial Intelligence Usage on Students' Intellectual Ability at University Level.
3- To identify the relationship between Artificial Intelligence Usage and Students' Intellectual Ability at University Level.
4- To find out the difference between public/private and male/female regarding Artificial Intelligence Usage and Students' Intellectual Ability at University Level.

Methodology

The design of the study is descriptive in nature. The philosophical paradigm of quantitative research is positivism. The population were comprised of all public and private universities of Lahore district. The total no of universities in Lahore district are 39 in which 16 are public and 23 are private (HEC, 2024). Sample was chosen by using a multistage sampling technique. First of all the research divided all population in two strata (public/private) by using stratified sampling technique. The researcher then use the cluster sampling technique to divide the entire population into three zones (clusters) based on according to their location. From each cluster three private and two public universities were selected by using simple random sampling. A Sample of 750 students (50 from each university) was selected through simple random sampling techniques. The instrument of the study were questionnaires. Artificial intelligence questionnaire adapts by (Chai, Lin, Jong, Dai, Chiu, & Qin, 2021) was for data collection. The researcher self-developed five-point likert scale questionnaire with the help of (Hasan, Karwan, Een, Riswanti, & Ujang, 2021) for Students' intellectual ability. Validity of the instrument was tested through expert opinion while the reliability of the instrument was tested through pilot testing. Cronbach's Alpha was computed to assess the dependability of the tool. The AI usage score was 0.881 and Students' intellectual ability value 0.854 whereas the reliability minimum of Cronbach's Alpha is 0.75. This demonstrated the instrument's dependability. Primary source of data was in current research. The participants of this study were administering through questionnaires. Statistical package for social science (SPSS) was used for data analysis. Mean, and S.D. was used for 1st objective, pearson r for 2nd objective, Regression analysis were used for of 3rd objective, and independent sample t-test for 4th research objective.

Data analysis

Artificial intelligence usage

Table 1 ***Sample description on the basis of mean and standard deviation***

Items	N	Mean	S.D.
I am aware of what artificial intelligence (AI) is and how it is used in various applications.	750	1.92	.967
I have used AI-powered educational tools or platforms for learning purposes.	750	1.87	.851
AI technologies help me understand difficult concepts more easily.	750	1.88	.885
AI-powered personalized learning platforms enhance my learning experience.	750	2.05	.948
AI tools provide valuable feedback that helps me improve my academic performance.	750	2.08	.911
I am concerned about the privacy and security of my data when using AI-powered educational platforms.	750	2.17	1.041
I worry about the potential bias or inaccuracies in AI algorithms affecting my learning outcomes.	750	2.32	1.115
I am concerned that excessive reliance on AI may hinder the development of critical thinking skills.	750	2.16	1.133
I believe AI will play an increasingly important role in education in the future.	750	2.36	1.149
I am interested in learning more about how AI can be used to enhance education.	750	2.31	1.067
I am satisfied with the use of AI technologies in my educational experience.	750	2.22	1.002
I believe that AI technologies have positively impacted my learning outcomes.	750	2.46	1.143
I prefer learning through AI-powered platforms over traditional teaching methods (e.g., lectures, textbooks).	750	2.37	1.122
AI technologies have made learning resources and materials more accessible to me.	750	2.17	1.025
I view AI as a helpful tool that complements and enhances my learning experience.	750	2.24	1.101

The above table illustrates the Artificial intelligence usage description. According to the respondents responses, I am aware of what artificial intelligence (AI) is and how it is used in various applications (M=1.92; SD=0.96), I have used AI-powered educational tools or platforms for learning purposes (M=1.87; SD=0.85), AI technologies help me understand difficult concepts more easily (M=1.88; SD=0.88), AI-powered personalized learning platforms enhance my learning experience (M=2.05; SD=0.94), AI tools provide valuable feedback that helps me improve my academic performance (M=2.08; SD=0.91), I am concerned about the privacy and security of my data when using AI-powered educational platforms (M=2.17; SD=1.04), I worry about the potential bias or inaccuracies in AI algorithms affecting my learning outcomes (M=2.32; SD=1.11), I am concerned that excessive reliance on AI may hinder the development of critical thinking skills (M=2.16; SD=1.13), I believe AI will play an increasingly important role in education in the future (M=2.36; SD=1.14), I am interested in learning more about how AI can be used to enhance education (M=2.31; SD=1.06), I am satisfied with the use of AI technologies in my educational experience (M=2.22; SD=1.00), I believe that AI technologies have positively impacted my learning outcomes (M=2.46; SD=1.14), I prefer learning through AI-powered platforms over traditional teaching methods (e.g., lectures, textbooks) (M=2.37; SD=1.12), AI technologies have made learning resources and materials more accessible to me (M=2.17; SD=1.02), and I view AI as a helpful tool that complements and enhances my learning experience. (M=2.24; SD=1.10). Overall, respondents' responses reflected toward the level of agreement.

Students' intellectual ability

Table 2 ***Sample description on the basis of mean and standard deviation***

Items	N	Mean	S.D.
I am skilled at identifying logical fallacies in arguments.	750	2.21	1.041
I can evaluate the credibility of information sources.	750	2.28	1.065
I enjoy discussing and debating different viewpoints.	750	2.21	1.017
I can draw conclusions based on evidence and reasoning.	750	2.21	1.029
I enjoy coming up with new ideas or inventions.	750	2.18	1.014
I can express myself creatively through writing, art, or music.	750	2.17	1.050
I like to explore unconventional solutions to problems.	750	2.19	1.085
I can see connections between seemingly unrelated ideas or concepts.	750	2.14	1.114
I consistently achieve high grades in my classes.	750	2.36	1.213
I feel confident in my ability to succeed academically.	750	2.21	1.091
I actively participate in class discussions and activities.	750	2.35	1.170
I enjoy learning new things and challenging myself intellectually.	750	2.22	1.103
I am willing to put in extra effort to overcome challenges.	750	2.12	1.035
I seek out opportunities to expand my knowledge and skills.	750	2.09	1.113
I am enthusiastic about my academic pursuits.	750	2.22	1.087
I can adapt my approach when faced with unexpected obstacles.	750	2.16	1.018
I am open to considering alternative viewpoints or perspectives.	750	2.24	1.059
I learn from my mistakes and use them as opportunities for growth.	750	2.26	1.107
I am comfortable stepping out of my comfort zone to try new things.	750	2.30	1.099
I can quickly adapt to changes in my learning environment or circumstances.	750	2.20	1.064
I actively participate in extracurricular activities related to my academic interests.	750	2.32	1.153
I believe in using my intellectual abilities to contribute positively to society.	750	2.14	1.109

The above table illustrates the students' intellectual ability description. According to the respondents responses, I am skilled at identifying logical fallacies in arguments (M=2.21; SD=1.04). I can evaluate the

credibility of information sources (M=2.28; SD=1.06), I enjoy discussing and debating different viewpoints (M=2.21; SD=1.01), I can draw conclusions based on evidence and reasoning (M=2.21; SD=1.02), I enjoy coming up with new ideas or inventions (M=2.18; SD=1.01), I can express myself creatively through writing, art, or music (M=2.17; SD=1.05), I like to explore unconventional solutions to problems (M=2.19; SD=1.08), I can see connections between seemingly unrelated ideas or concepts (M=2.14; SD=1.11), I consistently achieve high grades in my classes (M=2.36; SD=1.21), I feel confident in my ability to succeed academically (M=2.21; SD=1.09), I actively participate in class discussions and activities (M=2.35; SD=1.17), I enjoy learning new things and challenging myself intellectually (M=2.22; SD=1.10), I am willing to put in extra effort to overcome challenges (M=2.12; SD=1.03), I seek out opportunities to expand my knowledge and skills (M=2.09; SD=1.11), I am enthusiastic about my academic pursuits (M=2.22; SD=1.08), I can adapt my approach when faced with unexpected obstacles (M=2.16; SD=1.01), I am open to considering alternative viewpoints or perspectives (M=2.24; SD=1.05), I learn from my mistakes and use them as opportunities for growth (M=2.26; SD=1.10), I am comfortable stepping out of my comfort zone to try new things (M=2.30; SD=1.09), I can quickly adapt to changes in my learning environment or circumstances (M=2.20; SD=1.06), I actively participate in extracurricular activities related to my academic interests (M=2.32; SD=1.15), I believe in using my intellectual abilities to contribute positively to society (M=2.14; SD=1.10). Overall, respondents' responses reflected toward the level of agreement.

Table 3 ***Effect of AI usage on Students' intellectual ability at university level***

Model Summary[b]

R	R Square	Adjusted R Square	Std. Error of the Estimate
.352[a]	.124	.123	.39704

a. Predictors: (Constant), Artificial Intelligence
b. Dependent Variable: Students' Intellectual ability

Table 4 ***Effect of AI usage on Students' intellectual ability at university level***

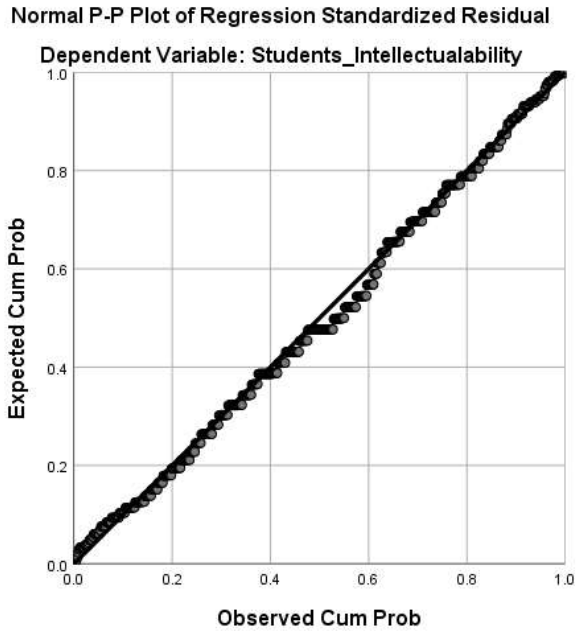
ANOVA[a]

	Sum of Squares	df	Mean Square	F	Sig.
Regression	16.661	1	16.661	105.688	.000[b]
Residual	117.918	748	.158		
Total	134.579	749			

a. Dependent Variable: Students Intellectual ability
b. Predictors: (Constant), Artificial Intelligence

Table 5 ***Effect of AI usage on Students' intellectual ability at university level***

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
	1.480	.073	.352	20.223	.000
AI usage	.340	.033		10.280	.000



The above table illustrates the effect of AI usage on Students' intellectual ability. The B value=0.340, t=10.280, p=.000 which indicates that there was highly significant effect of AI usage on Students' intellectual ability at university level.

Table 6 ***Relationship between AI usage and Students' intellectual ability at university level***

Correlations			
		Artificial intelligence	**Students' intellectual ability**
Artificial intelligence	Pearson Correlation	1	.352**
	Sig. (2-tailed)		.000
	N	750	750
Students' intellectual ability	Pearson Correlation	.352**	1
	Sig. (2-tailed)	.000	
	N	750	750

**. Correlation is significant at the 0.01 level (2-tailed).

The above table illustrates the relationship between AI usage and Students' intellectual ability at university level. The Pearson correlation value 0.352, and p-value 0.000 shows that there was moderate positive significant relationship between AI usage and Students' intellectual ability at university level.

Table 7 ***Difference between public and private sector regarding AI usage and Students' intellectual ability at university level***

Group Statistics						
	Sector	**N**	**Mean**	**S.D.**	**t-value**	***p-value***
Artificial intelligence	public	300	2.1709	.41781	12.3462	0.000
	private	450	2.1702	.45274		
Students' intellectual ability	public	300	2.2250	.42403	19.4730	0.000
	private	450	2.2136	.42420		

The above table illustrates the difference between public and private sector regarding AI usage and Students' intellectual ability at university level. The t-value of AI usage 12.3462, and p-value 0.000 shows significant difference, while on the other hand, t-value of Students' intellectual ability 19.4730, and p-value 0.000 also shows significant effect and difference between the groups. This shows that there was highly significant difference between public and private sector regarding AI usage and Students' intellectual ability at university level.

Table 8 ***Difference between male and female regarding AI usage and Students' intellectual ability at university level***

Group Statistics						
	Gender	**N**	**Mean**	**S.D.**	**t-value**	***p-value***
Artificial intelligence	Male	373	2.1870	.43305	5.2390	0.000
	Female	377	2.1542	.44442		
Students' intellectual ability	Male	373	2.2007	.38860	8.0873	0.000
	Female	377	2.2355	.45598		

The above table illustrates the difference between male and female regarding AI usage and Students' intellectual ability at university level. The t-value of AI usage 5.2390, and p-value 0.000 shows significant difference, while on the other hand, t-value of Students' intellectual ability 8.0873, and p-value 0.000 also shows significant effect and difference between the groups. This shows that there was highly significant difference between male and female regarding AI usage and Students' intellectual ability at university level.

Discussion

The level of Artificial Intelligence (AI) usage in university education is increasingly shaping students' intellectual abilities, offering both opportunities and challenges. AI tools such as intelligent tutoring systems, adaptive learning platforms, and generative applications enhance personalized learning experiences and foster critical thinking (Baker et al., 2019). However, excessive reliance on AI may limit students' cognitive effort, leading to over-dependence on technology for problem-solving (Barr et al., 2015). At the university level, the integration of AI demands a balance to ensure that students develop essential analytical and independent reasoning skills while leveraging technological benefits (Selwyn, 2020). Effective AI usage should be aligned with pedagogical goals to support intellectual growth.

The use of Artificial Intelligence (AI) at the university level significantly influences students' intellectual abilities, shaping how they acquire, process, and apply knowledge. AI-powered tools, such as adaptive learning systems and automated feedback platforms, promote critical thinking by tailoring educational content to individual learning needs (Luckin et al., 2016). However, concerns arise over cognitive offloading, where students rely on AI to perform tasks that traditionally require analytical effort, potentially diminishing their

problem-solving and independent reasoning skills (Barr et al., 2015). Moreover, the ethical and equitable integration of AI remains essential to ensure that these technologies enhance intellectual growth rather than exacerbate existing educational disparities (Williamson & Eynon, 2020).

The relationship between Artificial Intelligence (AI) usage and students' intellectual ability at the university level is multifaceted, involving both enhancement and potential challenges. AI tools, such as intelligent tutoring systems and learning analytics platforms, foster intellectual growth by personalizing learning pathways and providing targeted feedback (Baker et al., 2019). These tools can develop critical thinking and problem-solving skills by encouraging active engagement with complex concepts (Luckin et al., 2016). However, excessive reliance on AI may lead to cognitive dependency, reducing opportunities for independent reasoning and creativity (Barr et al., 2015). Thus, the impact of AI on intellectual ability depends on its balanced and thoughtful integration into the learning process.

Differences in Artificial Intelligence (AI) usage and its impact on students' intellectual ability at the university level often vary across public and private institutions and between male and female students. Private universities, with greater access to resources, tend to adopt AI tools more readily, enabling enhanced personalization and learning support compared to public institutions, where resource constraints may limit AI integration (Williamson & Eynon, 2020). Gender differences also emerge, as male students often report higher confidence in using AI-driven technologies, while female students may face barriers such as lower perceived competence or unequal access to digital tools (Norris et al., 2012). Addressing these disparities is essential to ensure equitable intellectual development through AI-enhanced education (Luckin et al., 2016).

Conclusion

In conclusion, the integration of Artificial Intelligence (AI) at the university level presents both opportunities and challenges for students' intellectual development. AI tools, such as adaptive learning systems and intelligent tutoring platforms, offer significant potential to enhance personalized learning, foster critical thinking, and support intellectual growth. However, there are concerns about the over-reliance on these technologies, which may limit students' ability to develop problem-solving skills and independent reasoning. Furthermore, disparities in AI usage across public and private institutions, as well as gender differences in access and confidence, highlight the need for equitable integration strategies. For AI to positively impact students' intellectual abilities, it must be thoughtfully incorporated into the educational process, ensuring that all students, regardless of background, can benefit from its potential without compromising core cognitive skills. Ultimately, a balanced approach, which combines the strengths of AI with traditional learning methodologies, is essential to maximize its educational benefits.

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