

University of Ibadan Lecturers' Perception of the Utilisation of Artificial Intelligence in Education

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Abstract

Artificial Intelligence (AI) is one rapidly expanding field of knowledge that has the potential to drastically modify traditional methods across industries, including the academic sector, and the likelihood of it causing major changes means that we all must be increasingly prepared. Therefore, this study investigated how University of Ibadan lecturers perceive the application of artificial intelligence (AI) in the Nigerian educational system. The survey method was adopted for the study and the purposive sampling technique was used to sample members of academic staff in the university. Data were collected from 97 lecturers, using a questionnaire titled "Lecturers' Perception of AI in Education (LPAIED)" which had a reliability value of $r=0.82$. Results showed that lecturers' perception of AI in education is highly positive. While there are no doubts as to the immense benefits that AI could bring to the field of education, this study showed that there are some reservations on the part of some lecturers towards its adoption. However, it was also revealed that regardless of their reservations, lecturers are completely willing to adopt AI in education. In the light of these findings, it was recommended that training and orientation programmes be organised for lecturers to aid a better understanding of the possibilities of AI, while also ensuring that higher institutions of learning are more equipped with modern technologies as this will help lecturers gradually eliminate unease and foster confidence and competence in using technology.

Keywords: Artificial Intelligence (AI), University Lecturers, Perception, Education

INTRODUCTION

We live in a century that is frequently referred to as a technological period, one in which the use of technology has become very customary. Technology can be observed playing significant roles in daily life, whether at home, at work, at school, or anywhere else. The importance of technology in moving us away from the traditional method of doing things in practically all fields of endeavour, as well as the fact that it has made the world a global village during the last few decades, cannot be overstated. It has progressively crept into every sector of human life, especially the field of education. Based on current trends and as each passing day proves, its use will continue at a quick speed (Budhwar, 2017).

The use of technology in education is an interesting concept, it is amazing to think that what was once considered unthinkable decades ago, has now become well accepted in academic institutions all across the globe, with students now permitted to make use of technologies in the classroom (Popenici & Kerr, 2017). Also, in various countries around the world, new educational curricula have been designed in order to incorporate this innovation. For example, in France, courses about internet technologies are taught to young pupils in primary schools, while high school students have an obligation to pass an exam proving their computer skills (Chassignol, Khoroshavin, Klimova, & Bilyatdinova, 2018). Equally becoming pervasive is the use of different interactive

educational technologies in higher institutions of learning. Students now make use of electronic gadgets such as tablets, while teachers also utilise different learning platforms such as Google Classroom, Edmodo, Moodle etc. In addition, there is a vast number of Massive Open Online Courses (MOOCs) used for online study (Chassignol et al. 2018). The result, without doubt, has been massive, ranging from helping to foster an improved means of pedagogical instruction, to creating a more fun and enjoyable teaching and learning process (Sahin & Thompson, 2007).

With the advancement in technology, continuous research and development are ongoing in a bid to introduce advanced technologies which are useful in making education easier. Some of the numerous technologies emerging in the world of education today are Block chain, Augmented Reality (AR), Virtual Reality (VR), and Artificial Intelligence (AI). Among these technologies, one that is rapidly influencing proceedings and causing a disruption in higher education globally is Artificial Intelligence (AI). Since its emergence at the 1956 Dartmouth Conference, the field of AI has received loads of attention from researchers and industries alike (UNESCO, 2019). It is one innovation that can be applied in different sectors and across diverse industries, ranging from healthcare, to finance, art, military, government, and even education (Frankenfield, 2021). In reality, AI is currently being

tested in diverse areas, for instance, computers have been built to play chess games and compete with humans; in transportation, self-driving cars are already in place, with top companies such as Facebook, Tesla, Google and Apple all investing huge amount of funds towards its actualisation. Experts in Educause (2018) categorised AI in education as an emerging innovation with a period of adoption of 2-3 years. According to the same report, these experts anticipate an enormous growth in the influence of AI in education by 43% between 2018 and 2022. Further predictions in the Horizon Report 2019 (Educause, 2019) revealed that AI applications in education are projected to grow even more significantly than this.

While there is no straightforward and general definition of AI, several definitions are provided from various studies. Professor Nilsson from Stanford University, in ITU (2018) defined AI as “that activity devoted to making machines intelligent, and intelligence is that quality that enables an entity to function appropriately and with foresight in its environment.” Another definition refers to AI as machines possessing human-level intelligence. But for the purpose of this study, AI is referred to as computers or computer-controlled machines that possess human-level intelligence, awareness, or knowledge. Artificial intelligence in education (AIED) is an aspect that has recently generated a lot of comments, with experts giving conflicting opinions on the role of AI in the field of education. However, conclusions by Congress Research Service revealed that the application of AI with respect to teaching and learning situations will take the following forms: tutoring, personalising learning, testing, and automating tasks (Joyce & Laurie, 2018). While there are a lot of questions yet to be answered, there is little doubt regarding how much of an impact the technology will make on the industry and that the future of higher education is tied to it. As a matter of fact, there are a few early examples of its successful application in education. One of such is Professor Ashok Goel’s creation of an AI teaching assistant, Jill Watson. The professor of computer science uses it to answer routine questions from students, and students acknowledged that her responses are indistinguishable from that of human assistants (Gimbel, 2018).

A more pedagogical application is that of an assistant professor at Cornell University, Erik Anderson, who worked with colleagues from the University of Pennsylvania, University of Washington and Microsoft to develop a programme that helps math teachers use AI to determine how students arrived at incorrect answers. What this intelligent machine does is that, it reverse-engineers a student’s thought process and provides details on what the student is doing wrong (Gimbel, 2018).

Despite the successes that have thus far been recorded in the application of AI, there still exists mixed perception of employees towards it. While some see it as a solution to existing and future problems, there are some who hold certain reservations that could mitigate its effective implementation. One major issue many people have against artificial intelligence is how it may affect human employment. With many industries looking to automate certain jobs, there is a concern that people would be pushed out of the workforce. Many lecturers in the education sector are of this view, with studies showing that a bulk of faculty members are reluctant about its usage as they are worried that they are going to be traded for a computer and they would lose their jobs as a result (Kurt, 2014). These concerns are not entirely surprising because according to reports from a poll by Gallup and Northeastern University, seventy-three percent of Americans believe AI will eliminate more jobs than it will create. Thus, AI in education faces this difficulty also. As self-driving cars may remove the need for taxi drivers, lecturers fear that they may also easily be replaced by machines, rendering them redundant in the process. True to that perception, Frey and Osborne (2013) noted that 47% of American jobs were estimated to be at risk due to automation.

Another negative belief that the workforce holds against AI is the loss of privacy. According to Zawacki-Richter et al., (2019), although AI has the potential to greatly advance the system of learning, it also requires huge amounts of data, including confidential information, which therefore raises huge concerns regarding privacy and data protection. Also, Subrahmanyam and Swathi (2018) submit that the implementation of AI would require a huge capital outlay, when combining the costs of installation, maintenance and repair.

In the light of these revelations, it is important to find out whether lecturers in the University of Ibadan feel the same way and if these beliefs are in any way contingent on gender. According to Hicks (2018), there is a clear disparity in the percentages of the gender of personnel in the AI sector, with that of male overwhelming that of female. Despite the success of the female gender in technology, research shows that the female gender is no longer prevalent in the industry as only 7% of students studying computer science and 17% of those working in technology in the UK are female (Liberty – Written evidence, 2017). It is clear that careers in technology have been normalised for men more than it has for women.

According to Bates, Cobo, Mariño and Wheeler (2020), AI is an emerging field of expertise that has the potential to transform practices in higher education. As a matter of fact, its application in

educational contexts continues to grow exponentially, such that by 2024 it is predicted to become a market worth almost \$6 billion. Yet, despite it possessing the potential to change the education system for the better, several concerns such as job security, loss of privacy, amongst others threaten to slow its adoption. The longer these concerns remain, the more difficult it will be to fully tap into the immense benefits that AI could bring. It is against this backdrop that this research was carried out, to find out the worldview of University of Ibadan lecturers concerning the application of AI in education. This is important because lecturers are important stakeholders in education, and will, to a large extent, determine how much of a success its adoption will be.

Research Questions

This study provided answers to the following questions:

1. In what ways do University of Ibadan lecturers think AI will benefit education?
2. What reservations do university of Ibadan lecturers have about incorporating AI into education?
3. Does gender influence University of Ibadan lecturers’ perception of the application of AI in education?

METHODOLOGY

This research was carried out using the survey design and the non-probability sampling technique was utilised. The reason for this type of sampling method was due to the difficulty in gaining access to the entire population as a result of the currently prevalent pandemic (Covid-19). Other reasons include time constraints, as well as the extremely difficult task of determining the size of the population. This study adopted the use of purposive sampling technique. This technique helped to ensure that only respondents who matched the parameters listed below were considered during data collection.

The parameters of this study were:

- Lecturers currently working at the University of Ibadan in the year 2021.
- Male and female lecturers at the University of Ibadan.
- Lecturers that have worked at the University of Ibadan for at least twelve months.
- Lecturers who were available and willing to complete the research instrument.

In the end, data were retrieved from ninety-nine (99) lecturers across ten (10) faculties, but two (2) did not meet the requirement about duration of work experience in the university. As a result, a total of ninety-seven (97) responses were used for the study. The distribution of respondents is given in table 1 below:

Table 1: Distribution of Respondents Based on Faculty

S/No	Faculty	No. Of Lecturers
1	Agriculture	8
2	Arts	12
3	Education	23
4	Law	6
5	Pharmacy	5
6	Renewable Natural Resources	4
7	Science	14
8	The Social Sciences	13
9	Technology	9
10	Veterinary	3
Total		97

The researcher collected data in two ways: through the physical distribution of a questionnaire and through an online survey using Google Forms. The research instrument had a reliability index of $r = 0.82$, and the data got from the administered questionnaires were subjected to inferential and descriptive statistics, and analysed using frequency counts, mean, standard deviation, Pearson Product Moment Correlation and t-test analysis.

RESULTS AND DISCUSSION

Research Question 1

In what ways do University of Ibadan lecturers think Artificial Intelligence (AI) will benefit education?

The various ways in which lecturers think AI will affect education are presented in the table below. Table 2 contains the perception of lecturers on the impact of AI in education.

Table 2: Benefit of AI in Education

S/N	ITEMS	SA	A	U	D	SD	Mean	St. Dev.
1.	I believe engaging AI in education will be great for the educational system, going forward.	33 (34%)	45 (46.4%)	15 (15.5%)	4 (4.1%)	0 (0%)	4.10	0.80
2.	AI will be more of a bane than benefit to education.	4 (4.1%)	16 (16.5%)	19 (19.6%)	36 (37.1%)	22 (22.7%)	2.42	1.13
3.	AI is just an upcoming trend	14	53	16	11	3	3.65	0.96

	and will take a long while before it can be successfully applied in Nigerian education sector.	(14.4%)	(54.6%)	(16.5%)	(11.3%)	(3.1%)		
4.	AI will aid research activities for lecturers and students alike.	36 (37.1%)	54 (55.7%)	5 (5.2%)	2 (2.1%)	0 (0%)	4.27	0.65
5.	AI will take away more jobs than it will create.	10 (10.3%)	29 (29.9%)	21 (21.6%)	29 (29.9%)	8 (8.2%)	3.04	1.16
6.	AI in education is here to stay.	23 (23.7%)	36 (37.1%)	35 (36.1%)	3 (3.1%)	0 (0%)	3.81	0.83
7.	I am convinced that teaching will become easier with the adoption of AI.	34 (35.1%)	52 (53.6%)	8 (8.2%)	2 (2.1%)	1 (1%)	4.19	0.75
8.	In the teaching profession, it is forthe use of AI to be limited.	9 (9.3%)	25 (25.8%)	22 (22.7%)	30 (30.9%)	11 (11.3%)	2.90	1.18
9.	The use of AI will help enhance teaching methodology.	40 (41.2%)	48 (49.5%)	4 (4.1%)	4 (4.1%)	1 (1%)	4.25	0.80
10.	I do not think AI will make any difference in teaching and learning.	5 (5.2%)	11 (11.3%)	9 (9.3%)	44 (45.4%)	28 (28.9%)	2.18	1.13
11.	AI will help to stimulate students' interests.	22 (22.7%)	61 (62.9%)	10 (10.3%)	2 (2.1%)	1 (1%)	4.05	0.71
12.	AI will be more useful in administration than in any other aspect of education.	10 (10.3%)	30 (30.9%)	25 (25.8%)	25 (25.8%)	7 (7.2%)	3.11	1.12
13.	I think teaching and learning will become more interactive with AI.	34 (35.1%)	54 (55.7%)	9 (9.3%)	0 (0%)	0 (0%)	4.25	0.61
14.	AI should only be used as a support system for teaching.	12 (12.4%)	54 (55.7%)	8 (8.2%)	19 (19.6%)	4 (4.1%)	3.52	1.07
15.	AI should replace the teacher in the classroom in order to allow for more focus on other responsibilities such as research.	3 (3.1%)	13 (13.4%)	10 (10.3%)	36 (37.1%)	35 (36.1%)	2.10	1.13
16.	AI in education is a necessity. It will help reduce the workload and stress of lecturers.	18 (18.6%)	40 (41.2%)	9 (9.3%)	28 (28.9%)	2 (2.1%)	3.45	1.15
17.	AI can deputise for lecturers when necessary.	28 (28.9%)	55 (56.7%)	6 (6.2%)	6 (6.2%)	2 (2.1%)	4.04	0.88
18.	AI will be useful in teaching difficult concepts.	29 (29.9%)	51 (52.5%)	13 (13.4%)	1 (1%)	2 (2.1%)	4.08	0.81
19.	Using AI will make it easier to diagnose learning difficulties in students.	20 (20.6%)	59 (60.8%)	14 (14.4%)	3 (3.1%)	1 (1%)	3.96	0.75
20.	AI will be more useful in research.	8 (8.2%)	41 (42.3%)	23 (23.7%)	22 (22.7%)	3 (3.1%)	3.29	1.01
21.	I see no use for AI in educational research.	3 (3.1%)	8 (8.2%)	9 (9.3%)	42 (43.3%)	35 (36.1%)	1.98	1.03
22.	AI will be very helpful in streamlining educational systems and processes.	26 (26.8%)	69 (71.1%)	1 (1%)	0 (0%)	1 (1%)	4.22	0.56
23.	I can get reliable feedback or suggestions needed to improve teaching strategies as a lecturer.	25 (25.8%)	61 (62.9%)	8 (8.2%)	3 (3.1%)	0 (0%)	4.11	0.67
24.	With AI, students can receive reliable support or feedback seamlessly.	31 (32%)	60 (61.9%)	6 (6.2%)	0 (0%)	0 (0%)	4.25	0.56

Table 2 shows that the perception of lecturers with respect to how artificial intelligence can impact education was largely positive. This is evident in eighteen out of the twenty-four test items listed. These are items 1, 2, 4, 6, 7, 9, 10, 11, 13, 16, 17, 18, 19, 20, 21, 22, 23, and 24, with seventeen of those items yielding high mean scores. In items 6 and 7, the opinions of lecturers were split, while item 6 showed a high percentage (36.1%) of uncertainty from the lecturers. Summarily, it can be inferred from the lecturers' responses that engaging AI in education will be great for the educational system going forward, with the positives far outweighing the negatives. Seventy percent of respondents agreed that AI is just an upcoming trend and will take a long while before it can be successfully applied within the Nigerian education sector.

From the results, it is evident that lecturers are aware of the benefits of AI, which includes aiding research

activities for lecturers and students alike, enhancing teaching methodology, creating increased interests in students, fostering interactivity, reducing workload and stress of lecturers, teaching difficult concepts, diagnosing learning difficulties in students, and getting reliable feedback or suggestions needed to improve lecturers' teaching strategies. Overall, the perception of the respondents in the utilisation of artificial intelligence in education is high and positive.

Research Question 2

What reservations do University of Ibadan lecturers have on incorporating AI into education?

The different reservations which lecturers have about the utilisation of AI in education are shown in the table below.

Table 3: Reservations about the Application of AI in Education

S/N	STATEMENTS	SA	A	U	D	SD	Mean	St. Dev.
1.	Technologies are still in their infancy, hence should not be used in teaching and learning.	4 (4.1%)	14 (14.4%)	3 (3.1%)	38 (39.2%)	38 (39.2%)	2.05	1.17
2.	I feel AI will lead to loss of human touch and interaction.	12 (12.4%)	43 (44.3%)	8 (8.2%)	16 (16.5%)	18 (18.6%)	2.70	1.28
3.	I do not believe AI will render lecturers redundant.	20 (20.6%)	29 (29.9%)	10 (10.3%)	17 (17.5%)	21 (21.6%)	3.72	1.01
4.	I would prefer education without AI.	2 (2.1%)	16 (16.5%)	13 (13.4%)	32 (33%)	34 (35.1%)	2.17	1.14
5.	I am of the opinion that AI would cause massive unemployment in higher education.	15 (15.5%)	23 (23.7%)	21 (21.6%)	21 (21.6%)	17 (17.5%)	2.67	1.17
6.	Using technology is not my greatest strength.	3 (3.1%)	21 (21.6%)	3 (3.1%)	34 (35.1%)	36 (37.1%)	2.18	1.23
7.	AI will destroy basic natural thinking.	1 (1%)	10 (10.3%)	12 (12.4%)	51 (52.6%)	23 (23.7%)	2.12	0.92
8.	AI is not cost-effective compared to existing/traditional method(s).	15 (15.5%)	40 (41.2%)	9 (9.3%)	24 (24.7%)	9 (9.3%)	3.28	1.25
9.	AI should only be used for simple and repetitive tasks.	5 (5.2%)	28 (28.9%)	16 (16.5%)	37 (38.1%)	11 (11.3%)	2.78	1.13
10.	AI will reduce learners' interest in learning.	1 (1%)	4 (4.1%)	9 (9.3%)	62 (63.9%)	21 (21.6%)	1.98	0.75
11.	Job loss is only likely to occur if one refuses to adjust to working with technology.	21 (21.6%)	47 (48.5%)	9 (9.3%)	18 (18.6%)	2 (2.1%)	3.69	1.07
12..	Privacy and security will be a thing of the past if AI is adopted.	17 (17.5%)	29 (29.9%)	17 (17.5%)	24 (24.7%)	10 (10.3%)	2.80	1.15
13.	Despite my reservations, I am fully ready to adopt the use of AI in my teaching.	38 (39.2%)	40 (41.2%)	10 (10.3%)	7 (7.2%)	2 (2.1%)	4.08	0.98

Table 3 shows that regarding reservations about the application of AI, the majority of respondents are of the opinion that the use of AI in education will greatly reduce the rate of human interaction (56.7%), cost much more than existing traditional methods (56.7%), as well as pose a threat to the right to privacy and security. However, results showed that respondents were divided on whether AI would cause massive unemployment(item 5)or not.The percentage of those who agreed and those who disagreed was 38%.Contrarily, the majority (68.1%) strongly disagreed that they would prefer education without AI.Also, 72.2% submitted that technology was not their major strength. Regardless of all reservations, majority of the respondents (80.4%) acknowledged that they were fully ready to adopt the use of AI in their teaching.

Research Question 3
Does gender influence University of Ibadan lecturers’ perception towards the application of Artificial intelligence in Education?

The responses to this research question were subjected to t-test analysis and the result is shown in Table 4 below.

Table 4: t-test Summary Showing the Difference in Perception of AI based on gender

	Gen der	N	Mea n	St. Dev.	D f	T	Si g	P
Appli cation of AI	M	5	85.	7.1	9	.0	.4	>0
	a	9	396	42	3	3	7	.0
			6	51		0	1	5
	Fe	3	85.	7.2				
	ma	8	351	42				
	le	4	68					

Table 4 shows the analysed results using t-test. The t-test value obtained was .030 with alpha value of 0.471 greater than 0.05 level of significance. This implies that, based on gender, there was no significant difference in the perception of University of Ibadan lecturers on the application of artificial intelligence; $N(97) = .030, p > 0.05$. Therefore, lecturers’ perception of the application of artificial intelligence did not differ based on their gender.

DISCUSSION OF FINDINGS

Based on the findings, 98% of the respondents believe that AI will be able to optimise the higher education industry. This is evident in the responses as the respondents indicated that AI would be able to “replace lecturers when necessary”, “help enhance teaching methodology” as well as “help streamline educational systems and processes”. From the aforementioned, it can be inferred that most of the respondents agree that AI is an agent for optimisation, and this in itself can be considered interesting. A number of authors have indicated this in their study (Ocaña-Fernández et al.2019; Renz &

Hilbig 2020). Also, approximately 60% of respondents think AI will reduce their workload, and 90% believe teaching and learning will become more interactive with the use of AI. These views corroborate Loeckx (2016) which sees AI as a learning tool that could be effective in reducing the burdens of both teachers and students, while simultaneously and successfully offering effective learning experiences to both parties.

On the reservations that lecturers have towards AIEd, 39.1% rejected the view that AI would cause massive unemployment in higher education, while 39.2% of the respondents support the view. From the current findings, supported with evidence from the literature, it can be seen that the two views are present (Dahlin2019; Kumari & Hemalatha2019; Popenici and Kerr 2017). In addition, 56.7% believed that the introduction of AI will lead to “loss of human touch and interaction”, this is in consonance with the findings of Forrester (2017). Furthermore, it can also be deduced from the study that 47.4% of respondents possess certain unease about data protection and fears about privacy loss. Zawacki-Richter et al. (2019) support this position when they stated that it is almost a certainty for the issue of privacy and data protection to be raised because AI will sometimes require large volumes of data, including information about students and lecturers which ought to be confidential. Also, 56.7% of respondents agreed with Fahimirad and Kotanjani (2018) by acknowledging that AIEd is an innovation that requires huge capital outlay to implement and sustain. Finally, this study revealed that, based on gender, there was no significant difference in the perception of University of Ibadan lecturers on the application of artificial intelligence. That is, both male and the female lecturers have equal tendencies to view the application of AI in the same way.

CONCLUSION AND RECOMMENDATIONS

While there are no doubts as to the immense benefits that AI could bring to the field of education, this study showed that there still remain certain reservations on the part of some lecturers towards its adoption. However, it was also revealed that regardless of these reservations, lecturers are completely willing to adopt AI in education. In the light of these findings, it was recommended that training and orientation programmes be organised for lecturers to increase their understanding of the possibilities of AI, while also ensuring that higher institutions of learning are better equipped with modern technologies, as this will help lecturers gradually eliminate unease. It will also foster confidence and competence in their use of technology. Additionally, in order to help eliminate the lecturers’ fear of job loss as a result of AI, relevant authorities should ensure that they start small during the process of AI adoption, and not try to

make all the education processes intelligent at the same time.

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