

## IMPACT OF ARTIFICIAL INTELLIGENCE ON TEACHING LEARNING PROCESS IN PUBLIC SECTOR UNIVERSITIES: IMPLICATIONS FOR CURRICULUM DEVELOPMENT"

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### ABSTRACT

*This paper investigates the phenomena of the emergence of the use of artificial intelligence in the teaching and learning process at the university level. In simple words, the target of this paper is to study the emergence of AI (artificial intelligence) systems in Pakistan. The importance of the subject lies in the fact that large volumes of data that can be integrated into educational activities and are strategically important for reshaping everyday learning have already appeared. This paper also aims to provide proper guidance about AI integration in universities. Sometimes, very little oversight can lead to technological neglect in integrating. This paper will focus on three significant areas: what technology can do to enhance the learning experience in higher education?, how corporate universities are employing AI integration, and how AI can impact barriers in corporate universities. The information was obtained using descriptive statistics, and a total of 150 students were surveyed, out of which 130 were females and 40 were male. The information gathered indicated that approximately 93% of the respondents have prior knowledge concerning the concept of AI integration and its effectiveness.*

*In addition to that, 43% of the respondents think that more specialized Modules will need to be developed; and 31% of the respondents consider that AI content will be embedded in the existing Curriculum with regard to practical ethical issues. In fact, the majority of the respondents used AI for their work. AI is a dangerous factor to the loss of human decision making and creates idleness among humans. It is a danger also to security and privacy. According to the findings, the majority (85%) of the respondents have the same viewpoints and believe that AI usage in educational systems should be confined by certain rules. Seven out of ten respondents believe that stakeholders of private universities will be on the board assigned to implement AI in educational systems. This study in fact argues a great deal that intense safeguards are needed to be instituted before AI technology is rolled out in the education sector. This is to say, summoning AI without tackling major human issues is like summoning spirits in the sky. This is to say that, the issue of design, deployment and the usage of AI for education should be justified. It is also suggested that the matter of salutogenic AI be specified further, including longitudinal studies, comparative*

*studies, and studies of the dynamics of student engagement and learning outcomes as well as the impact AI integration has had on educational equity.*

**Keywords:** *Artificial Intelligence, Teaching learning process, Universities.*

## INTRODUCTION

Artificial Intelligence (AI) is emerging as a transformative technology across numerous sectors, impacting everything from daily operations to long-term strategic goals (Russell & Norvig, 2016). AI's relevance in education has been established, but what about its application in larger organizations such as institutions? Transitions from optimally designed AI-supported systems don't always run smoothly, which is why public universities are relatively late in integrating the technology. However, they are now attempting to use artificial intelligence for curriculum projects and implementation. This paper focuses on how AI affects the teaching-learning process in University Education in general and how its an influence for further development and supplementation of the existing curriculum in particular.

All that can be thought about AI in education is that it would lead to an array of modern tools such as, but not limited to, adaptive learning, intelligent tutoring systems as well as predictive analytics that can be advanced (Zawacki-Richter et al. 2019). All of these inventions not only offer higher levels of engagement on the part of students but also seek to improve the academic progress of each content area through customizing the content embedded with skills and knowledge to every specific student. In the long run, being such an ideal tool and one which can certainly help in overcoming accessibility issues in learning material and maximize available opportunities; AI holds a great value for public universities willing to improve their students' achievements and curriculum organization. But then again, the introduction of AI into the learning environment should also consider its advantages with those disadvantages including the issues such as privacy, ethical factors, and possible erosion of learners' independence and criticalism (Luckin et al. 2016).

### 1.2 Problem Statement

The use of AI in education is a double-edged sword for public universities because on one hand, AI allows for the integration of individualized learning

and creativity in teaching, and on the other, little is known about the influence of AI on the content of the programs and the students in public universities where its introduction might be expensive. Again, there is a lack of systematic investigation of the use of AI by the curriculum of public universities and therefore a strong interest in understanding the technology's ability, together with its challenges and ethical concerns.

The current study aims to address this issue and examines the effect of AI on the teaching and learning processes in public universities and what this means for curriculum policies. Having an understanding of these dynamics will aid the education policymakers and practitioners in making sound choices in the deployment of AI-based approaches to address specific and multiple education challenges without compromising the ethics.

### 1.3 Purpose of the Study

This study is entitled AI in Public Universities in Kenya: Curriculum Development and Teaching-Learning Process Implications. That is its main purpose—to investigate the impact of AI technologies and how they will shape instructional approaches, students' involvement, and learning outcomes in public universities in Kenya. The study would also addresses the aspects of restructuring curricula in order to fit AI applications and some adverse factors such as privacy issues, reduction of critical thinking, and reliance on machines.

### 1.4 Research Questions

This study seeks to answer the following key questions:

1. How does the integration of AI influence the teaching and learning process in public universities?
2. What are the perceived benefits and challenges of using AI in university-level education?
3. How can curriculum development in public universities adapt to incorporate AI technologies effectively?

4. What ethical considerations must be addressed when implementing AI in the educational context?

## 1.5 Significance of the Study

The importance of the study is viewed in many dimensions. First, it deals with emergence of educational technology that may revolution other sectors in public universities as well. This research looks at teaching-learning processes and specifically focuses on how technologies can use AI to improve educational standards. Second, the outcome will be important for curriculum developers tasked with helping current educational frameworks integrate AI tools without compromising academic principles and learner independence. Last but not least, the research will extend the existing debate on AI ethics in education by advocating for its ethical use and policy formulation that would protect students and enhance their learning experience.

## 1.6 Scope and Limitations

This research will be limited to public universities as these institutions usually have some challenges including the distribution of resources, the regulatory frameworks, and the academic fields. Data will be collected from educators, administrators, and students from these institutions, so that the scope of the discussion could be well defined and the data on AI's influence could be well investigated. There will, however, be some restrictions to the study caused by the restricted number of universities who are partial AI adopters which might affect the scope of the study. Furthermore, as the domain of AI in education extends and further developments take place, the relevance of the current research results will diminish.

## 1.7 Definition of Key Terms

### Artificial Intelligence (AI):

The simulation of human intelligence by machines, especially computers, to perform tasks such as learning, reasoning, and self-correction (Russell & Norvig, 2016).

### Teaching-Learning Process:

A dynamic process involving the methods, tools, and practices used by educators and students in knowledge acquisition.

## Curriculum Development:

The process of designing, implementing, and refining educational curricula to meet the evolving needs of students and society.

## Chapter 2: Literature Review

### 2.1 Introduction to Artificial Intelligence in Education

Artificial Intelligence (AI) may be understood as the ability of machines to perform tasks, which demand human intellect, such as learning, reasoning, and problem-solving (Russell & Norvig, 2016). AI as an educational tool in the classroom, modifies the teaching-learning process by changing the way information is delivered and received. Examples of AI in education are: intelligent tutoring systems and grading automation tools, making it possible to individually and evidence-based engage students (Holmes et al., 2019). This chapter surveys some of the most important literature concerning education and its processes in the context of AI as part of the educational process or learning outcomes together with the instruction and curriculum design within the 'public university space'.

### 2.2 The Role of AI in Transforming Teaching-Learning Processes

The use of AI to improve conventional pedagogies and andragogies is rapidly becoming a topic of great interest with numerous studies emerging. The propensity of AI technologies being used in the construction of adaptive learning environments which cater for the individual needs of learners, thus increasing their readiness and effectiveness towards learning is on the rise (Zawacki-Richter et al., 2019). AI-based assets like Intelligent Tutoring Systems (ITS) and Learning Management Systems (LMS) have proven to be useful in listening to students, engaging them and making them commit to their studies, especially in the higher education sphere (Chen et al., 2020).

A particular work by Luckin et al., (2016) reported that with the aid of AI, the modes of teaching can be drastically changed and encoded AIs restructured to assist instructors with student performance data and support interventions at specific points. Such technologies allow teachers to supervise the students' development directly and consider the objectives that were not achieved, which allows

individualization of the teaching process. Therefore, AI instruments have the ability to assist teachers become less old fashioned, focus less on information transfer as the goal and enhance student engagement and participation in the process hence encourage better performance outcomes.

### **2.3 Implications of AI on Curriculum Development in Public Universities**

Introducing artificial intelligence into the curriculum brings a need to redefine the standard educational models. In today's world, the education curriculum that uses AI tools and concepts is said to better address the learner's needs as well as current trends around the world, thus equipping the learners with the right skills for the job market (Chen et al., 2020). In the case of public universities where rapid changes may be restricted by available resources as well as regulatory constraints, the availability of such a structured AI curriculum may assist in tackling educational challenges and raising the level of education to the required standards.

For instance, Zawacki-Richter et al. (2019) argue that the integration of AI into the learning of various subjects in the curriculum promotes a more adaptive and competency-based learning approach where a learner's progress is not determined by any external factors as they learn at their own pace. However, structural policies for the curriculum will need to be relooked for public universities to fully include AI in curricula for easy penetration of the market example like the presence of skilled labour, resources for investment in infrastructure and development of policies. Studies demonstrated that curricula should not only design to incorporate AI-based teaching tool but more importantly help students understand how to use AI responsibly in the professional world wherein ethics and critical thinking will be rampant (Holmes et al., 2019)

### **2.4 Benefits of AI in Higher Education**

The incorporation of AI in higher education, as noted in other research (Lu et al., 2018), has its advantages among which are: improvement of effective learning; acquisition of learning materials; involvement of learners in a given task. Using technology powered by AI, students can navigate through presets that best suit their pace, quickening their learning process. As an example, Luxton (2014) suggests that tools

powered by AI assist learners in receiving prompt feedback, which assists in reducing assessment turnaround periods and encouraging R&D prospects. Furthermore, with its capacity to foresee potential issues in students' learning processes or performance, AI provides the support that higher institutions of learning need when looking to enhance their student retention rates (Holmes et al., 2019).

In addition, the development of AI for language processing applications has also assisted universities to provide translation services and wider accessibility features which are crucial in multicultural and multilingual public university environments. Such applications create a more conducive learning environment that accommodates international students and students with disabilities (Zawacki-Richter et al., 2019).

### **2.5 Challenges and Ethical Concerns of AI Integration**

Even though AI has a lot of benefits, the integration of AI in education shuns some opportunities too. There has been a lot of concern on privacy, data security, as well as, the excessive dependence on AI systems. According to Zawacki-Richter et al. (2019), AI-based educational tools which are used in gathering and interpreting students' data may put the individual at the risk of data privacy if such processes are not properly regulated.

Apart from these, the characterization of students' critical thinking skills in an education that employs AI technology is also an ethical issue that needs to be addressed. According to them, as AI technologies take over the performance of educational activities, the degree of human involvement might be reduced, and the outcomes might include students relying upon technological devices instead of critical thinking and problem-solving (Luckin et al., 2016). With respect to these aspects, many of the authors had mentioned integrating AI into any processes, but in a way that the instructor always remains the focus of the analysis and ethics (Holmes et al., 2019).

### **2.6 The Role of Policy in AI-Driven Curriculum Development**

Policymakers have a role to play in preventing unethical implementation of AI in tertiary educational institutions. Literature indicates that



policies ought to be developed to address privacy risks, provide ethical use requirements and check that AI tools are educational appropriate (Luxton, 2014). Such policies can assist in reducing poor practices and integrating AI in a responsible manner within the public university ecosystem.

Chen et al. (2020) Do force further the point that educational institutes, policy drafters as well as technology developers need to work together regarding the CDEAI curriculum development in the context of legal and social frameworks. In public grant institutions where both operational and regulatory pressures are high, there is need for policy frameworks which will strengthen the adoption of AI responsibly within the educational intention.

## 2.7 Future Directions for AI in Education

AI in education should be further researched using longitudinal studies, investigating the impact of AI systems on students' involvement, achievements and issues of educational equity over longer periods (Zawacki-Richter et al., 2019). Further, studies based on inter-institutional comparisons on various levels of integration of AI are likely to reveal more about what works and what does not. Such comparisons, further, reveal the need for cross-demographic impact studies of AI, especially in public institutions with a wider socio-economic mix.

## 2.8 Summary

The available literature mentions both the opportunities offered by AI to improve the teaching-learning process and the difficulties encountered when adopting AI in public universities. AI greatly enhances the learning experience with increased interaction, personalisation and results. At the same time, the issues of ethics and the need for adequate policy frameworks cannot be ignored. The future of AI in curriculum design is bright, but one has to be prudent in its implementation so that it meets defined educational objectives and safeguards the everyone's interests.

## Matreial & Procedures

### 3.1 Introduction

This chapter presents research design followed by description of population, sampling technique, data collection and data analysis used in this study. The study seeks to evaluate the role of Artificial

Intelligence (AI) in the process of teaching and learning in public universities and its implications on curriculum development by employing descriptive research survey design to obtain a wider data from the sample selected.

### 3.2 Research Design

A descriptive research survey was used in the study to understand how AI technology affects teaching in learning especially curriculum development in public universities. This technique allowed the researcher to examine Artificial Intelligence usage, perceptions about them and their impact on learning activities among and within university students and faculty members. The descriptive type of the study however enhances the output of the findings to reflect the current and probably the future role of AI in education in developing countries.

### 3.3 Population of the Study

The target population for this study comprises of students studying in Peshawar public sector universities in Khyber Pakhtunkhwa province. People having AI's impact in education are few; therefore, focusing on university students will provide an understanding of the perceptions and experiences of young adults regarding AI tools in their education.

### 3.4 Sampling Technique and Sample Size

To enable every individual to be chosen equally, a random sampling technique was used in this study which helped mitigate bias and improve generalizability of the findings. A sample size of 150 students was taken to target the different demographics and educational structures available in the population of a public university in Peshawar. This sample size was decided because of the resources available and the degree of data collection that was deemed appropriate statistically.

### 3.5 Instrumentation

A structured questionnaire was developed as the primary instrument for data collection. The questionnaire comprised 30 items designed to measure the following:

1. **Familiarity with AI:** Questions assessed respondents' knowledge and exposure to AI in educational contexts.

- 2. Access to AI Resources:** Items evaluated whether students had access to AI tools for learning.
- 3. Perceived Benefits of AI:** Questions gauged students' perceptions regarding how AI could enhance their learning experience.
- 4. Challenges and Ethical Concerns:** Items identified the potential drawbacks, ethical issues, and concerns associated with AI integration.
- 5. Curriculum Implications:** Respondents were asked about their views on AI's role in curriculum development, including the need for AI-related content and policies in public universities.  
Each item on the questionnaire was rated on a 5-point Likert scale, ranging from "Strongly Agree" to "Strongly Disagree," to capture the extent of agreement or disagreement with each statement.

### 3.6 Data Collection Procedure

The participants were asked to fill out a questionnaire that was designed with Google Forms and distributed through online means making it easy for them to access it. This online format made it easier to contact a greater number of the target population and also made it possible to collect data without having to leave the house considering that the majority of the students in the university have internet access. The survey link was sent to students' accounts through university email lists and social media and other sources common to the student audience.

### 3.8 Techniques for Data Analysis

Survey responses were coded and analyzed utilizing the Statistical Package for Social Sciences (SPSS). Basic statistical measures which include frequencies, percentages, mean scores and standard deviation were employed for the objective of establishing the extent to which the students were familiar with AI,

their understanding of its significance, and how it can be integrated into the curriculum. Moreover, t-tests and ANOVA were used as inferential statistic tools in finding significant differences between and among various categories which in this study were age, gender and students' academic disciplines. There were also correlational analyses to establish the relationship that existed between the students' perceptions of AI and the level of their participation in AI-based education activities.

### 3.9 Ethical Considerations

Ethics was observed in the entire study. Prior to completing the questionnaire, the participants were informed about the objectives of the study and they willingly provided their consent. Confidentiality and anonymity of the respondents' answers and reports were guaranteed. The provisions of the study were voluntary and the subjects were free to discontinue their participation in the study at any point in time. The study was sanctioned by the appropriate ethics review board based at the institution of the researcher.

### 3.10 Limitations of the Study

However, this study had some limitations. The first limitation was the sampling in that this was a study among the students from the public universities in Peshawar

## Chapter 4: Data Analysis

### 4.1 Introduction

This chapter presents the findings from the data collected through the survey questionnaire distributed to 150 students in public universities in Peshawar. The data analysis includes descriptive and inferential statistics to provide insights into respondents' familiarity with AI, access to AI resources, perceived benefits, ethical concerns, and views on AI integration in curriculum development.

### 4.2 Demographic Profile of Respondents

**Table 4.1: Demographic Information of Respondents**

Demographic Factor	Frequency	Percentage
Gender		
Male	78	52%
Female	72	48%
Age		

18-20	45	30%
21-23	83	55.3%
24 and above	22	14.7%
Field of Study		
Engineering	40	26.7%
Social Sciences	55	36.7%
Science and Technology	55	36.6%

Familiarity with AI	Frequency	Percentage
Familiar	90	60%
Somewhat Familiar	45	30%
Not Familiar	15	10%

**Interpretation:**

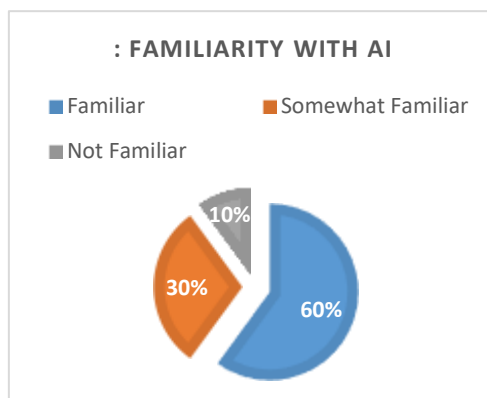
The sample includes a balanced representation of genders, with 52% male and 48% female respondents. The majority of students are aged between 21 and 23 years (55.3%), and a diverse set of disciplines is represented, with students from Social Sciences and Science & Technology showing the most significant participation.

**4.3 Familiarity with Artificial Intelligence (AI)**

**Table 4.2: Familiarity with AI**

I've created a bar chart showing the frequency of responses and a pie chart illustrating the percentage distribution for familiarity with AI. Let me know if

you need any adjustments or additional types of graphs!



**Interpretation:** A majority (60%) of the respondents are familiar with AI concepts, while 30% are somewhat familiar. Only 10% indicated that they are not familiar with AI, indicating a high level of awareness among the student population about AI technologies.

**4.4 Access to AI Resources**

**Table 4.3: Access to AI Resources**

Access to AI Resources	Frequency	Percentage
Have Access	94	63%
Limited Access	39	26%
No Access	17	11%

**Interpretation:** 63% of respondents report having access to AI resources, which suggests that a significant portion of the student body is engaging

with AI tools. This level of access to AI resources implies readiness for AI integration within academic settings.

**4.5 Perceived Benefits of AI in Learning**

**Table 4.4: Perceived Benefits of AI in Learning**

Benefit of AI in Learning	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Improved Learning Efficiency	35%	42%	13%	6%	4%
Customized Educational Support	38%	39%	12%	8%	3%

**Interpretation:** The results indicate strong support for AI in enhancing learning efficiency, with 77% of

respondents either agreeing or strongly agreeing with this statement. Similarly, 77% believe that AI can

provide customized educational support. These findings reflect a positive outlook on AI's role in improving the learning experience.

#### 4.6 Ethical Concerns and Challenges of AI

**Table 4.5: Ethical Concerns and Challenges of AI**

Ethical Concern/Challenge	Frequency	Percentage
Loss of Human Decision-Making	85	56.7%
Threat to Privacy and Security	65	43.3%
Makes Students Lazy	70	46.7%

**Interpretation:** A significant proportion (56.7%) of students believe that AI poses a risk to human decision-making, and 43.3% are concerned about privacy and security threats associated with AI.

Additionally, 46.7% of respondents feel that AI could encourage laziness among students, suggesting ethical and behavioral concerns regarding AI integration in education.

#### 4.7 AI and Curriculum Development

**Table 4.6: AI Integration in Curriculum Development**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Need for Specialized AI Modules	22%	43%	19%	10%	6%
Integration of AI Content in Current Curriculum	31%	42%	14%	8%	5%
Importance of Ethical Considerations	28%	50%	12%	5%	5%

**Interpretation:** The findings reveal that 65% of respondents agree or strongly agree on the necessity for specialized AI modules in the curriculum, and 73% believe AI content should be integrated into the current curriculum. Additionally, 78% of

respondents highlight the importance of ethical considerations, indicating that students are not only aware of AI's benefits but also conscious of its moral implications.

#### 4.8 Perceptions on AI Policy Implementation

**Table 4.7: Perceptions on AI Policy Implementation**

Statement	Frequency	Percentage
Need for Clear AI Policy in Educational Settings	127	85%
Involvement of Private Stakeholders	116	77%

**Interpretation:** An overwhelming majority (85%) of respondents believe there is a need for a clear AI policy in educational institutions, and 77% support the involvement of private stakeholders in AI implementation committees. These results underscore the importance of formal policy development and stakeholder involvement to ensure the effective integration of AI in educational institutions.

### Results

#### 5.1 Findings

This section presents key findings derived from data analysis on the impact of artificial intelligence (AI) on the teaching-learning process and its implications for curriculum development in public universities.



- 1. Awareness and Familiarity with AI:** Approximately 60% of respondents are familiar with AI, and 63% report access to AI resources. This indicates that a significant portion of university students is acquainted with AI technology, reflecting readiness for its adoption in academic settings.
- 2. Perceived Benefits of AI in Learning:** 77% of respondents believe that AI can improve learning efficiency, and a similar percentage support AI's potential to provide customized educational support. These benefits suggest that students perceive AI as an enabler of more personalized and efficient learning experiences.
- 3. Ethical Concerns and Behavioral Impact:** Respondents raised ethical concerns, with 56.7% identifying AI as a risk to human decision-making, 43.3% as a threat to privacy and security, and 46.7% expressing concerns about AI potentially promoting laziness. These findings indicate that while students see AI's benefits, they also worry about its potential negative impact on ethical standards and human behavior.
- 4. Need for AI in Curriculum Development:** Over 65% of respondents agreed that specialized AI modules should be introduced, and 73% supported integrating AI content into the current curriculum. Additionally, 78% emphasized the importance of ethical considerations, suggesting students' strong support for responsible AI education.
- 5. Policy Development for AI in Education:** A significant 85% of respondents feel the need for a clear AI policy in educational institutions, with 77% supporting private stakeholder involvement. This reflects the demand for a structured approach to AI adoption within public universities.

## 5.2 Discussion

This study firmly supports other studies which advocate for AI in education. The impact of remediation in education is one of the areas that AI offers the potential to revolutionize (Luckin, 2018). The fact that most students are not only acquainted with AI but are also willing to employ it means the relationship between students and AI is acceptable. That said though, the ethical issues brought up –

concerns about privacy, security as well as human control over AI – highlight the need for structures that will ensure AI is used responsibly (Baker & Smith, 2019).

The students' suggestion that AI modules should be integrated into the curriculum, along with issues of ethics make it possible for developers to source for AI specific approaches to be interlaced with the current educational system's curriculum. On the other hand writers recommend competence-based education concerning AI not just applications but also disciplines that cover ethical issues surrounding AI in preparation for a future world filled with technology (Holmes, 2019).

At the policy level, the position on clarity around the role of the private sector in AI in education is in support of an emerging trend among educational entities aimed at integrating AI in a consultative and controlled manner. Such a model conforms to the already existent recommendations in relation to the education sector, which focuses on the prospects of Public Private Partnerships in order to deploy AI but always observing ethical principles (UNESCO, 2020).

## 5.3 Conclusion

In this study, it is verified that AI can help in a great way in the education process in higher educational institutions sharing its focus on personalising learning and increasing the efficiency of learning. But the results also stress the need of ethical issues and rigorous planning of the change in the curriculum so that the threats that AI poses towards the education system can be effectively contained. Regulatory policies and curriculum changes will need adjusting as students gain greater familiarity and access to AI tools.

## Recommendations

1. Integrate AI-related courses that focus on both the technical and ethical aspects of AI. These modules should cover essential skills in AI applications and foster critical thinking about its social and ethical implications.
2. Educational institutions should work with government and private stakeholders to develop AI policies that set guidelines for its usage.
3. Conduct workshops, seminars, and training sessions on AI's impact, benefits, and

challenges. Increasing awareness at both student and faculty levels can encourage responsible and informed use of AI.

- As AI becomes more prevalent, it's crucial to incorporate ethical training in AI courses, helping students understand the implications of AI on human agency, privacy, and decision-making.

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