The University of Papua New Guinea School of Business and Public Policy

Emergence of Artificial Intelligence (AI) tools in Higher Education: Challenges and Strategies

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Emergence of Artificial Intelligence (AI) tools in Higher Education: Challenges and Strategies

OUTLINE

1.0 Introduction

Artificial Intelligence (AI) has emerged as a transformative technology with the potential to revolutionize various industries, including Higher Education. AI is a dynamic tool used across industries for better decision making, increasing efficiency and eliminating repetitive work.

John McCarthy (1927 – 2011) was an American computer and cognitive scientist who was one of the founders of the AI discipline. AI is the simulation of human intelligence processes by machines, especially computer systems.

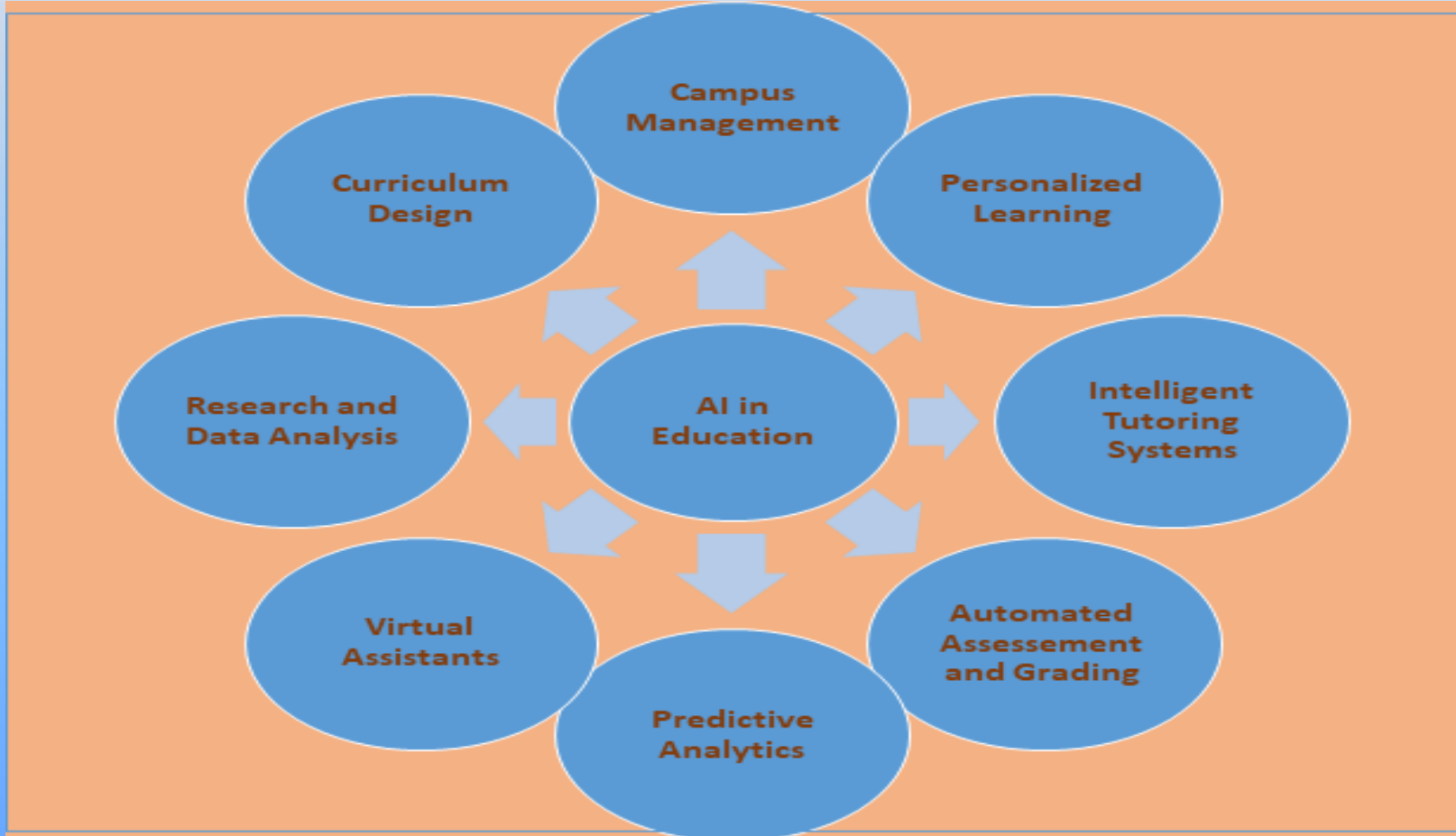**Figure**: In real world some of the sectors have been using AI Applications.

Source: Tech vidavan

1.0 Introduction

The Emergence of AI tools in Higher Education refers to the growing use of AI technologies and applications within educational settings, particularly in colleges and Universities.

Figure: Some key areas where AI is making an impact in higher education include

Source: Author

1.1 Background of the study

The use of AI in education presents exciting opportunities to transform and improve learning experiences. However, it is essential to consider and address the potential challenges and ethical concerns to ensure that AI is utilized responsibly and enhances education for all learners.

Using AI in higher education has both proponents and opponents in their viewpoints. They have expressed two contrasting thoughts on this topic:

Proponent's Perspective - Advantages of AI in Education: AI can revolutionize education by personalizing learning experiences, enhancing student engagement, and improving overall efficiency.

Opponent's Perspective - Concerns about AI in Education: While AI offers promising possibilities, there are also significant concerns that need to be addressed to ensure responsible and ethical use in education. Question on **Academic integrity.**

Professor Stephen Hawking, (2018) has warned that the creation of powerful artificial intelligence will be "either the best, or the worst thing, ever to happen to humanity", and praised the creation of an academic institute dedicated to researching the future of intelligence as "crucial to the future of our civilization and our species".

1.1Background of the study

- Using AI-generated content in course work is leading universities to revise their academic integrity policies.

- While artificial intelligence (AI) can be a valuable resource for students, it also poses a significant challenge to academic integrity.

- The use of AI tools leaves room for cheating, plagiarism and fabrication. The onus is therefore on educational institutions to ensure that students use AI ethically and in accordance with academic integrity policies.
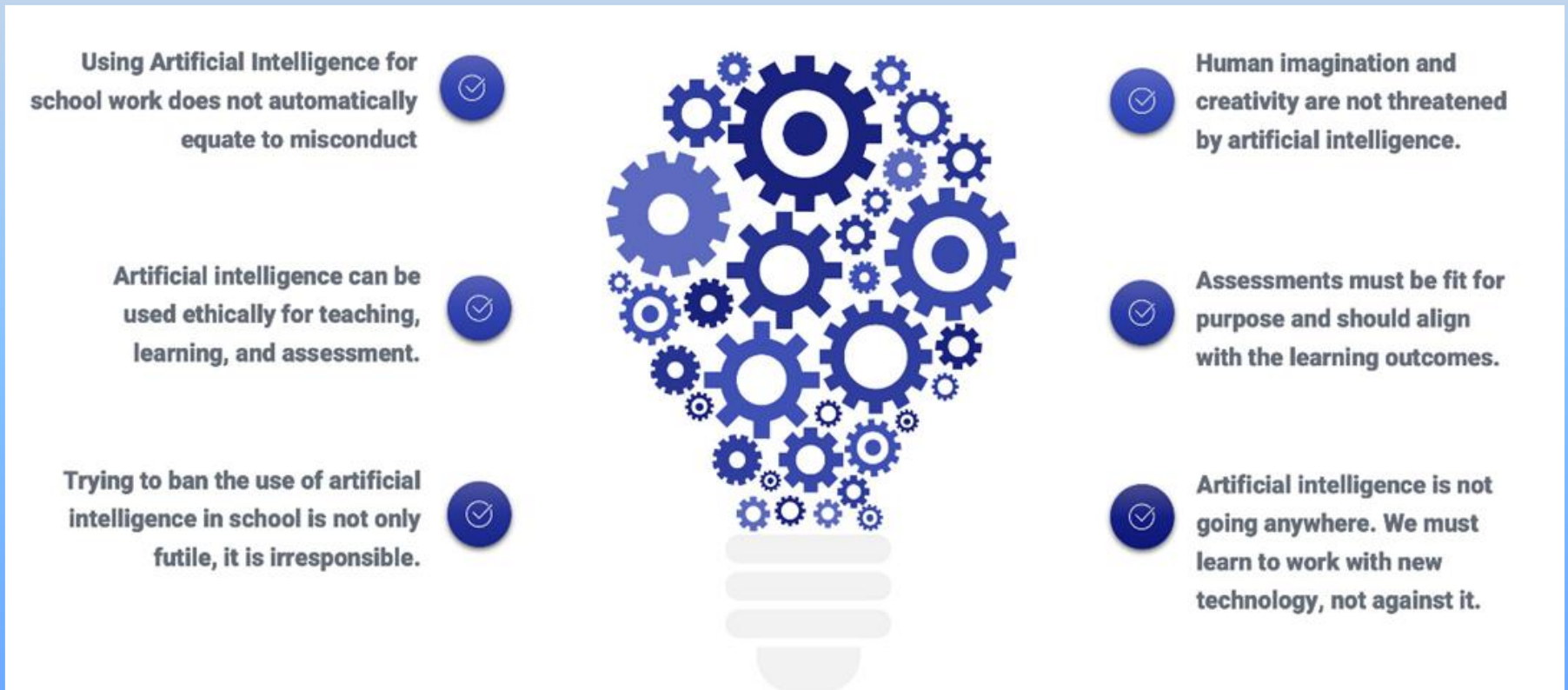
At some point, even calculators which were introduced in the 1980s were considered a threat to academic integrity

1.1Background of the study

Academic integrity is a fundamental principle in education and research that emphasizes honesty, transparency, and responsible behavior in all academic activities. When it comes to using AI tools, there are several important considerations to ensure academic integrity.

Figure: Artificial inelegance and Academic Integrity

Using Artificial Intelligence for school work does not automatically equate to misconduct

Artificial intelligence can be used ethically for teaching, learning, and assessment.

Trying to ban the use of artificial intelligence in school is not only futile, it is irresponsible.

Human imagination and creativity are not threatened by artificial intelligence.

Assessments must be fit for purpose and should align with the learning outcomes.

Artificial intelligence is not going anywhere. We must learn to work with new technology, not against it.

Source: Sara Elaine, University of Calgary 2022

1.2 Objective of the Study

The research objectives for studying the integration of AI tools in higher education with a focus on challenges and strategies are as follows:

- Investigate the ethical implications of AI use in higher education, focusing on data privacy, algorithmic bias, and potential consequences.

- Examine the technical challenges and requirements for integrating AI tools into existing educational systems.

- Based on the research findings, formulate recommendations for strategies and best practices for higher education institutions to effectively adopt and implement AI tools, considering both technical and ethical aspects.

2.0 Literature Review

Several countries around the world are actively using AI applications in education to enhance learning experiences and improve educational outcomes. Some of the countries at the forefront of AI integration in education include: China, USA, India, Finland. Australia, South Korea, United Arab Emirates, Canada, UK and Singapore.

China: The Chinese government has encouraged the use of AI-powered tutoring platforms, virtual classrooms, and personalized learning systems to cater to the diverse needs of its massive student population, (International Journal of Information Management 71, 2023).

Australia: Australian educational institutions are using AI to enhance teaching and learning experiences. AI applications include personalized learning platforms, AI-driven assessment tools, and virtual tutors.(Australian Human Rights Commission, 2023)

Singapore: Singapore has integrated AI applications into its educational ecosystem. AI-driven platforms are used for student assessment, personalized learning, and enhancing teacher training.(National Artificial Intelligence Strategy, 2019)
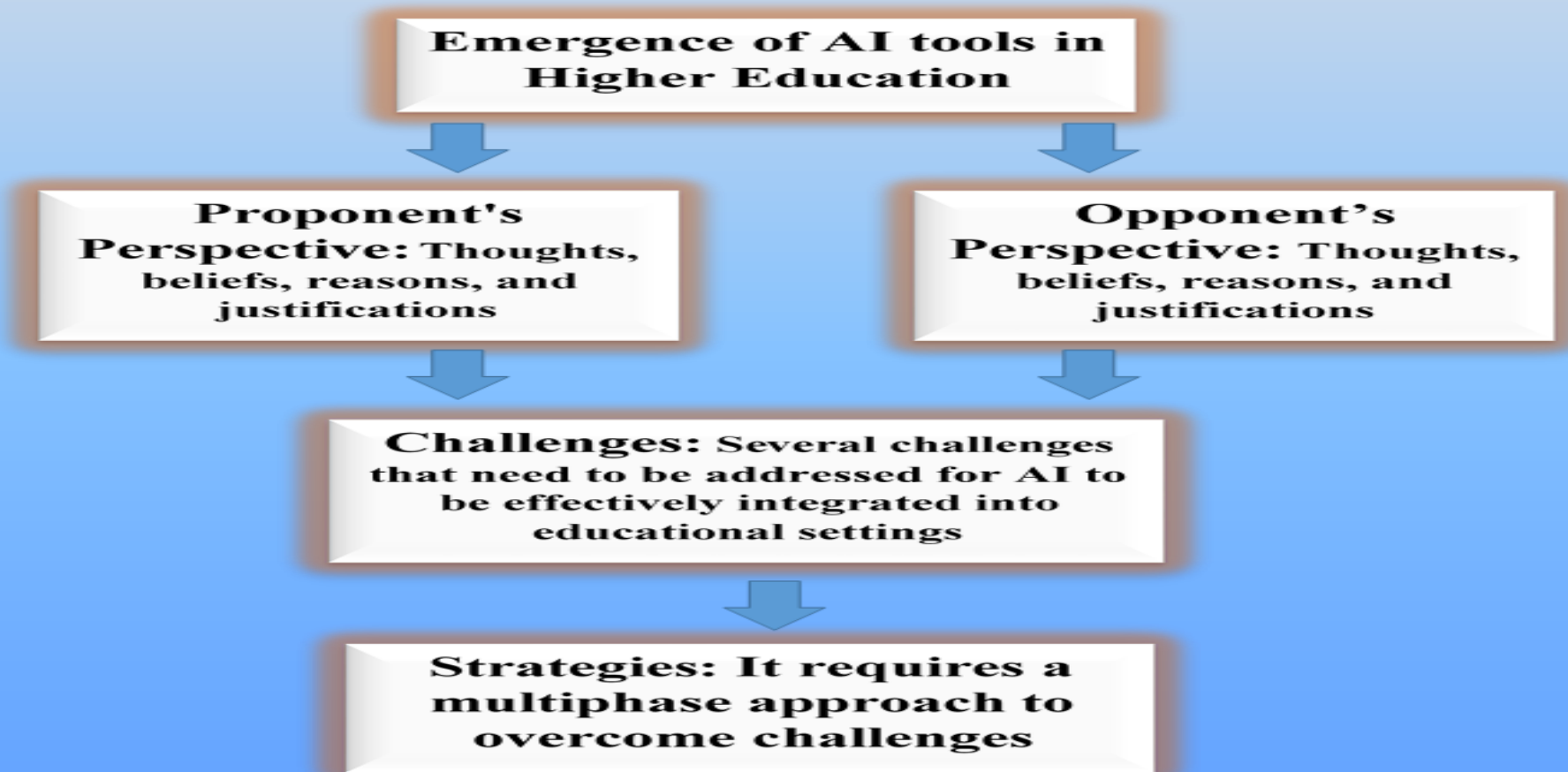
Finland: Finland has been experimenting with AI in education to improve student outcomes and streamline administrative processes.(AI, policy innovation and the future of work and learning, 2022)

Canada: Canadian universities and schools are exploring AI-powered virtual tutors and personalized learning platforms to cater to students' individual needs. (A Canadian Perspective on Responsible AI, 2023)

It is necessary to ensure fairness when applying AI in education. With the development of AI, developing countries face the risk of exacerbating the divisions in education by new technologies. Just as the digital divide has separated those who can access to the Internet from those who cannot, the ever-widening algorithmic divide now threatens to deprive many educational opportunities provided by AI. (J. Huang, S. Saleh, Y. Liu, 2021)
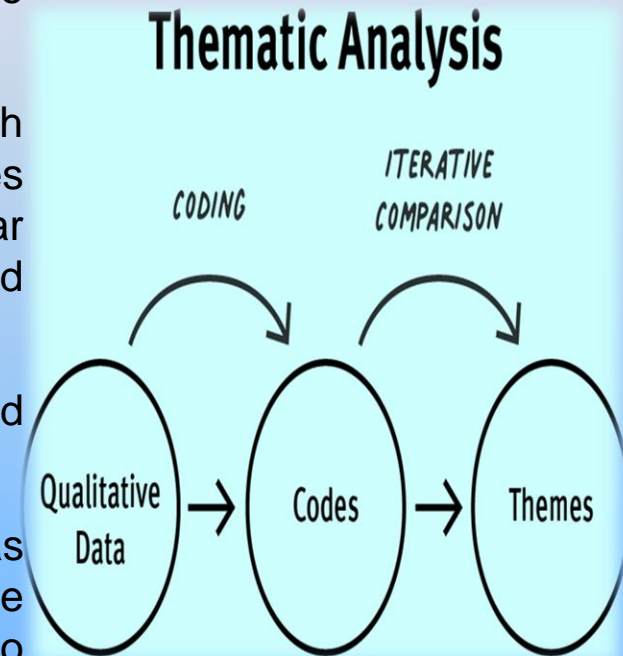
2.1 Conceptual Framework

"Proponent's and Opponent's Perspectives" refers to the viewpoints for and against of a contemporary and controversial topic. Analyzing the expertise perspectives can be valuable in discussions, debates, or critical thinking exercises. When discussing the "proponent's and Opponent's perspectives," its considering the thoughts, beliefs, reasons, and justifications that someone who supports and against a particular idea might have.

Emergence of AI tools in Higher Education

Proponent's Perspective: Thoughts, beliefs, reasons, and justifications

Opponent's Perspective: Thoughts, beliefs, reasons, and justifications

Challenges: Several challenges that need to be addressed for AI to be effectively integrated into educational settings

Strategies: It requires a multiphase approach to overcome challenges

3.0 Methodology

The exploration of the applications and use of AI in higher education is largely based on literature studies and interviews with various stakeholders within and outside the educational field.

- This study used a descriptive design method and approach to answer the research objectives.

- The qualitative approach conducted on desktop research is basically involved in collecting data from existing resources based on the material published in reports and similar documents that are available for public, websites, obtained from government agencies reports and other publications.

- The set of interviewees conducted with academics in the field of AI

- Examines the data to identify common themes, topics, ideas and patterns of meaning that come up repeatedly. An inductive thematic analysis approach involves allowing the data to determine themes.

- As many material as possible was collected around applications of AI in education, after which (partly on the basis of the knowledge gained from interviews) the information was structured and framed.

Thematic Analysis

CODING   ITERATIVE COMPARISON

Qualitative Data → Codes → Themes

4.0 Findings and Discussions

Opponent's perspectives regarding AI in education represent the viewpoints of individuals or groups who have reservations, concerns, or objections to the widespread adoption and integration of artificial intelligence in educational settings. These concerns are not necessarily against technological advancement, but rather focus on potential drawbacks and challenges associated with AI in education.

Following **THEMES** are from the literature review of the data and reports collected in regards to **Opponent's Perspectives.**

Loss of Human Connection

Job Displacement

Data Privacy and Security

Inequitable Access

Loss of Creativity and Critical Thinking

Bias and Fairness

Standardized Learning Paths

Overemphasis on Testing

Depersonalization of Education

Ethical Dilemmas

Loss of Traditional Teaching Methods

Distraction and Dependency

4.0 Findings and Discussions

Proponent's perspectives regarding AI in education represent the viewpoints of individuals or groups who support and advocate for the widespread adoption and integration of artificial intelligence in educational settings. These proponents believe that AI has the potential to bring about positive changes and improvements in various aspects of education.

Following **THEMES** are from the literature review of the data and reports collected in regards to **Proponent's Perspectives.**

Personalized Learning

Efficiency and Automation

Data-Driven Insights

Improved Accessibility

Real-Time Feedback

Advanced Tutoring

Enhanced Engagement

Lifelong Learning

Efficient Resource Allocation

Customizable Curriculum

Reduced Teacher Workload

Global Collaboration

Challenges of AI tools in education

AI in education has the potential to revolutionize how to learn, teach, and assess knowledge. However, there are several challenges that need to be addressed for AI to be effectively integrated into higher educational settings:

1. **Data Privacy and Security:** The use of AI in education involves collecting and analyzing student data, which raises concerns about data privacy and security.

2. **Bias and Fairness:** Biased AI algorithms could reinforce existing inequalities, leading to unequal opportunities for students.

3. **Lack of Personalization:** While AI can offer personalized learning experiences, achieving true personalization is challenging.

4. **Teacher Training and Support:** Integrating AI tools into classrooms requires teachers to have the skills and training to effectively use and manage these tools.

5. **Loss of Human Interaction:** Overreliance on AI could lead to a reduction in face-to-face interactions between students and teachers, which are crucial for emotional and social development.

6. **Ethical Considerations:** AI in education raises ethical questions about data ownership, algorithm transparency, decision-making accountability, and the potential for AI to replace human educators.

7. **Adaptation to Curriculum Changes:** Educational systems often have rigid curricula that may not easily accommodate the flexibility and adaptability of AI-driven learning.

8. **High Initial Costs:** Developing and implementing AI solutions can involve significant financial investments, including technology infrastructure, software development, and ongoing maintenance.

9. **Limited Access to Technology:** Not all students and schools have equal access to the technology required for AI-driven education. This digital divide can exacerbate educational inequalities.

10. **Resistance to Change:** Some educators and stakeholders might resist the adoption of AI in education due to fear of job displacement, lack of understanding, or skepticism about the effectiveness of AI tools.

11. **Monitoring and Accountability:** As AI systems track student progress and performance, questions about who has access to this data and how it's used for assessment and accountability arise.

12. **Constant Technological Advancements:** The field of AI is rapidly evolving, making it a challenge for educational institutions to keep up with the latest developments and ensure that their AI systems remain up-to-date and effective.

4.0 Findings and Discussions

Strategies to Overcome the Challenges of AI tools in education

Overcoming the challenges of integrating AI in education requires a multifaceted approach that involves careful planning, collaboration, and ongoing evaluation. Here are some strategies to consider:

Data Privacy and Security:

Implement strong data encryption and cybersecurity measures to protect student data. Adhere to strict data privacy regulations and ensure transparent data usage policies. Provide clear consent mechanisms for students and parents regarding data collection and usage.

Bias and Fairness:

Regularly audit and assess AI algorithms for biases and address any identified issues promptly. Diversify training data to reduce biases and ensure fair representation of all student groups and Use bias-detection tools to identify potential biases in algorithms before deployment.

Lack of Personalization:

Develop AI algorithms that can adapt and adjust to individual learning needs over time. Provide options for students to customize their learning experiences and preferences and Combine AI-driven recommendations with teacher expertise to create truly personalized learning pathways.

Teacher Training and Support:

Provide comprehensive training for educators on using AI tools effectively in the classroom. Offer ongoing professional development opportunities to keep teachers updated on AI advancements. Foster a supportive environment where teachers can collaborate and share best practices for integrating AI.

Loss of Human Interaction:

Design AI tools that complement, rather than replace, human interactions. Encourage blended learning approaches that combine AI-driven instruction with face-to-face interactions. Emphasize the importance of social and emotional learning alongside AI-driven content.

4.0 Findings and Discussions

Strategies to overcome Challenges of AI tools in education con...

Ethical Considerations:

Establish clear guidelines and codes of ethics for AI use in education. Involve ethical experts in the development and deployment of AI systems to ensure responsible practices. Promote transparency by explaining to students and teachers how AI is being used and the implications of its use.

Adaptation to Curriculum Changes:

Work with educators to align AI tools with existing curricula and learning objectives. Develop AI solutions that are flexible and adaptable to curriculum changes and updates.

High Initial Costs:

Seek funding opportunities from governmental sources, private organizations, and grants to support AI implementation. Consider cost-sharing models among educational institutions to pool resources for AI infrastructure.

Limited Access to Technology:

Develop strategies to bridge the digital divide by providing access to devices and internet connectivity for underserved students. Partner with community organizations and technology companies to increase access to technology.

Resistance to Change:

Provide educators with evidence of AI's positive impact on student outcomes and classroom efficiency. Offer training and workshops that focus on the benefits of AI in education and address common misconceptions.

Monitoring and Accountability:

Clearly define who has access to student data and how it will be used for assessment and accountability. Implement regular audits and oversight mechanisms to ensure responsible data usage.
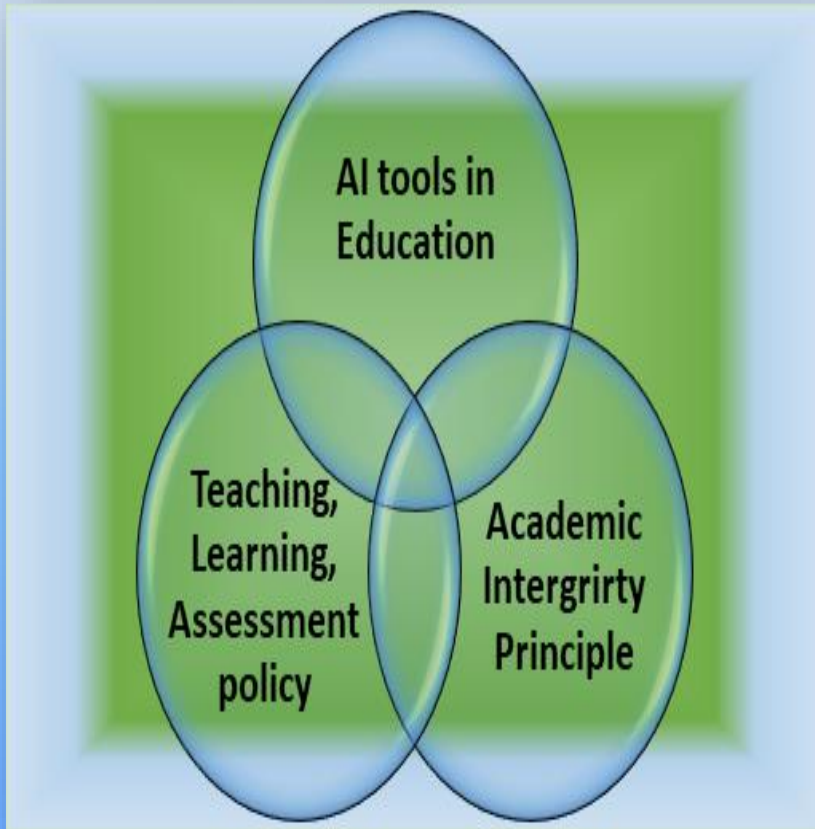
Constant Technological Advancements:

Stay informed about the latest AI developments through conferences, research publications, and partnerships with AI experts. Plan for ongoing updates and improvements to AI systems to keep them current and effective.

5.0 Conclusions

Educators need to carefully consider AI tools including ChatGPT and issues of academic integrity to move towards an assessment system that leverages AI tools.

Figure: Educational Institutions integrate the intersection of AI, Academic integrity and Teaching, learning and assessment policy.

Source: Author

- Teaching, Learning, Assessment policy is to guide the process of continuous improvement in teaching, learning and assessment at the college.

- Academic integrity is a principle in education and a choice to act in a responsible way so others can trust on the institutions and academic qualifications. It means conducting all aspects of academic life in a responsible and ethical manner.

- AI tools in education provide interactive, adaptive learning platforms, and intelligent feedback, making them the best companions for students. With AI's assistance, teachers can cater to individual needs, promote student engagement, and improve learning outcomes.

17

Thank You

Queries and Remarks