


# AI-Driven Leadership in Educational Policy: A Systematic Literature Review



Dean Collin Langeveldt <sup>1</sup> 

<sup>1</sup> Department of Education Studies, School of Education, Sol Plaatje University, Kimberley, South Africa.

## ABSTRACT

This article reviewed Langeveldt's 2024 framework for educational policy. It highlights the role of Artificial Intelligence (AI) in making data-driven decisions easier. Policymakers can use AI to improve resources, curriculum, and policy choices. The paper analysed AI's ability to sift through large data sets, spot trends, and predict outcomes. It also discussed challenges such as data privacy, bias, and unexpected effects. The study was based on theories such as constructivism and ethical AI. It aims to understand AI's role in education. It shows examples in which AI has improved student performance and resource use. The research method included a review of existing studies on AI in education. It also offered solutions for schools facing resource constraints. The article ended with a call for AI-driven policies that are effective, fair, and adaptable. It found that AI can indeed improve policies by providing clearer insights and predictions. Finally, it suggests future research to explore AI's evolving impact on education.

## Correspondence

Dean Collin Langeveldt

Email:

[dean.langeveldt@spu.ac.za](mailto:dean.langeveldt@spu.ac.za)

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## INTRODUCTION

Artificial intelligence (AI) is transforming education at a rapid pace.<sup>1</sup> It brings new opportunities and challenges for leaders and policymakers.<sup>2</sup> AI is being used more for personalised learning and better administration. It can tailor learning make teaching more effective and improve results.<sup>3</sup> Generative AI has shown promise in enhancing instructional material design, making it more relevant to vocational

<sup>1</sup> Ritika Mahajan et al., "Stakeholder Theory," *Journal of Business Research* 166 (2023): 114104; Aida Akavova, Zarema Temirkhanova, and Zarina Lorsanova, "Adaptive Learning and Artificial Intelligence in the Educational Space," *E3S Web of Conferences* 451 (November 20, 2023): 06011, <https://doi.org/10.1051/e3sconf/202345106011>; Shiyun Ou, "Transforming Education: The Evolving Role of Artificial Intelligence in The Students Academic Performance," *International Journal of Education and Humanities* 13, no. 2 (April 3, 2024): 163–73, <https://doi.org/10.54097/cc1x7r95>.

<sup>2</sup> Dean Collin Langeveldt and Doniwen Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice," *Interdisciplinary Journal of Education Research* 6, no. s1 (2024): 1–9; Innocent C. Igbokwe, "Artificial Intelligence in Educational Leadership: Risks and Responsibilities," *European Journal of Arts, Humanities and Social Sciences* 1, no. 6 (November 1, 2024): 3–10, [https://doi.org/10.59324/ejahss.2024.1\(6\).01](https://doi.org/10.59324/ejahss.2024.1(6).01); Paul H. Jacques, Hollye K. Moss, and John Garger, "A Synthesis of AI in Higher Education: Shaping the Future," *Journal of Behavioral and Applied Management* 24, no. 2 (July 31, 2024), <https://doi.org/10.21818/001c.122146>.

<sup>3</sup> Akavova, Temirkhanova, and Lorsanova, "Adaptive Learning and Artificial Intelligence in the Educational Space"; Abdul Qayyum et al., "Enhancing Social-Emotional Skills in Early Childhood Education-A Comparative Analysis," *Pakistan Journal of Society, Education and Language (PJSEL)* 10, no. 2 (2024): 159–75; Abimbola Eden Chima, Nneamaka Chisom Onyebuchi, and Sulaimon Adeniyi Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations," *Magna Scientia Advanced Research and Reviews* 10, no. 2 (March 30, 2024): 006–013, <https://doi.org/10.30574/msarr.2024.10.2.0039>.

training needs.<sup>4</sup> However, it also raises ethical, legal, social, and cultural issues.<sup>5</sup> These include data privacy, algorithm bias, and unexpected outcomes.

This article presents a framework for AI in educational leadership.<sup>6</sup> It aims to support data-driven decisions in policy.<sup>7</sup> The framework helps move from theory to practice in the use of AI. It also discusses the benefits and challenges schools face, such as resource needs and tech limitations when using AI. The goal is to offer insights for policy on resources and curriculum.<sup>8</sup> The article will examine the ability of AI to analyse educational data, spot trends, and predict results.<sup>9</sup> It will also tackle ethical and practical issues. These areas include data privacy, algorithmic bias, and unforeseen consequences.<sup>10</sup> The input of teachers, students, and parents will provide a more complete view. The aim is to create policies that are effective, fair, and meet learners' needs.<sup>11</sup>

The article ends with suggestions for research on how AI can further shape policies. It seeks to balance the benefits and challenges of AI, ensuring its safe use in education. The paper will first explain the method, and then discuss the theories around AI. It will further analyse the role of AI in policymaking, address challenges, and propose a new framework.

## THEORETICAL FRAMEWORKS

This study draws on several theoretical frameworks to analyse the integration of AI into educational leadership and policymaking.

**Table 1: Summary of Theoretical Frameworks**

Theory	Key Concepts
Constructivist Learning Theory	Active role of learners, personalised learning experiences, adaptive environments
Transformational Leadership Theory	Inspiring and motivating followers, data-driven insights for decision-making
Decision-Making Theory	Information processing, risk assessment, ethical considerations

<sup>4</sup> Fadhli Ranuharja et al., "Relevance and Impact of Generative AI in Vocational Instructional Material Design: A Systematic Literature Review," *Salud, Ciencia y Tecnología* 5 (January 1, 2025): 1336, <https://doi.org/10.56294/saludcyt20251336>.

<sup>5</sup> Florina Mihai Leta and Diane Paula Corina Vancea, "Ethics in Education: Exploring the Ethical Implications of Artificial Intelligence Implementation," *Ovidius University Annals. Economic Sciences Series* 23, no. 1 (August 31, 2023): 413–21, <https://doi.org/10.61801/OUAESS.2023.1.54>; Sribala Vidyadhari Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications," *ArXiv Preprint ArXiv:2407.18745*, 2024; Emily Barnes and James Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness," *Forum for Education Studies* 2, no. 2 (June 21, 2024): 1229, <https://doi.org/10.59400/fes.v2i2.1229>.

<sup>6</sup> Ranuharja et al., "Relevance and Impact of Generative AI in Vocational Instructional Material Design: A Systematic Literature Review."

<sup>7</sup> Nashwa Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration," *International Research Journal Of Engineering & Applied Sciences* 12, no. 3 (July 2024): 01–06, <https://doi.org/10.55083/irjeas.2024.v12i03001>; Halomoan Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research," *TEM Journal*, November 27, 2024, 3397–3404, <https://doi.org/10.18421/TEM134-73>; Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future."

<sup>8</sup> Sunil Kumar Prabhakar and Seong-Wan Lee, "Holistic Approaches to Music Genre Classification Using Efficient Transfer and Deep Learning Techniques," *Expert Systems with Applications* 211 (January 2023): 118636, <https://doi.org/10.1016/j.eswa.2022.118636>; Khansa Mohammed Elam, "Exploring the Challenges and Future Directions of Big Data and AI in Education," *Journal of Artificial Intelligence General Science (JAIGS) ISSN:3006-4023* 1, no. 1 (June 18, 2024): 81–93, <https://doi.org/10.60087/jaigs.v1i1.173>; Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future."

<sup>9</sup> Elam, "Exploring the Challenges and Future Directions of Big Data and AI in Education"; Adel Mahmoud Al Samman, "Harnessing Potential: Meta-Analysis of AI Integration in Higher Education," in *2024 ASU International Conference in Emerging Technologies for Sustainability and Intelligent Systems (ICETSIS)* (IEEE, 2024), 1–7, <https://doi.org/10.1109/ICETSIS61505.2024.10459420>; Ou, "Transforming Education: The Evolving Role of Artificial Intelligence in The Students Academic Performance."

<sup>10</sup> Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations"; Igbokwe, "Artificial Intelligence in Educational Leadership: Risks and Responsibilities"; Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future"; Mihai Leta and Vancea, "Ethics in Education: Exploring the Ethical Implications of Artificial Intelligence Implementation"; Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications"; Zouhaier Slimi and Beatriz Villarejo Carballido, "Navigating the Ethical Challenges of Artificial Intelligence in Higher Education: An Analysis of Seven Global AI Ethics Policies," *TEM Journal*, May 29, 2023, 590–602, <https://doi.org/10.18421/TEM122-02>.

<sup>11</sup> Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications"; Elam, "Exploring the Challenges and Future Directions of Big Data and AI in Education"; Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future."

Ethical Frameworks for AI	Bias, Privacy, Accountability, Transparency, and Fairness
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### Constructivist Learning Theory

This theory highlights how learners construct their knowledge. AI provides personalised learning experiences that adapt to individual needs.<sup>12</sup> These systems provide personalised feedback, helping students grow.<sup>13</sup> This approach aligns with the idea of learner agency, where students immerse themselves in their learning.<sup>14</sup> With AI, students can focus on their strengths and weaknesses, leading to a better understanding of the material.<sup>15</sup>

### Transformational Leadership Theory

This theory showcases leaders' capacity to inspire followers to pursue shared goals. AI-driven educational leaders can take advantage of data insights to improve learning outcomes. They inspire others with their vision and aim for common goals.<sup>16</sup> AI aids leaders in making informed decisions about resources and curriculum.<sup>17</sup> As shown in recent studies on post-apartheid leadership, school principals play a vital multidimensional role in navigating these AI-driven demands, balancing instructional vision with legal accountability and ethical stewardship.<sup>18</sup> It also helps them understand the needs of students and teachers, leading to better decisions.<sup>19</sup>

### Decision-Making Theory

This theory sheds light on decision-making about information, risk, and ethics.<sup>20</sup> AI improves educational choices using data and analysis.<sup>21</sup> Knowing the information is key AI helps leaders process data quickly, allowing them to make better decisions.<sup>22</sup> However, the ethical aspects of AI decisions are vital to consider.<sup>23</sup> Addressing bias in AI algorithms is crucial to fairness in education.<sup>24</sup>

### Ethical Frameworks for Artificial Intelligence

These frameworks emphasise the importance of considering the ethical implications of AI systems, including issues such as bias, privacy, and accountability.<sup>25</sup> These considerations are crucial to ensure that educators use AI responsibly and fairly in education. Ethical considerations are central to the responsible use of AI in education.<sup>26</sup> Drawing on feminist pedagogical and legal perspectives, it is also

<sup>12</sup> Akavova, Temirkhanova, and Lorsanova, "Adaptive Learning and Artificial Intelligence in the Educational Space"; Rukaiyya Qureshi, Shital Hajare, and Prateek Verma, "A Review on the Role of Artificial Intelligence in Personalized Learning," in *2024 Asia Pacific Conference on Innovation in Technology (APCIT)* (IEEE, 2024), 1–5, <https://doi.org/10.1109/APCIT62007.2024.10673706>; Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations."

<sup>13</sup> Qayyum et al., "Enhancing Social-Emotional Skills in Early Childhood Education-A Comparative Analysis."

<sup>14</sup> Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations."

<sup>15</sup> Akavova, Temirkhanova, and Lorsanova, "Adaptive Learning and Artificial Intelligence in the Educational Space."

<sup>16</sup> Ranuharja et al., "Relevance and Impact of Generative AI in Vocational Instructional Material Design: A Systematic Literature Review."

<sup>17</sup> Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration."

<sup>18</sup> Doniwen Pietersen, Dean Collin Langeveldt, and A. Van Wyk, "The Multidimensional Role of the Principal in Post-Apartheid South Africa," *Research in Educational Policy and Management* 5, no. 2 (2023): 263–74.

<sup>19</sup> Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research."

<sup>20</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice"; Igbokwe, "Artificial Intelligence in Educational Leadership: Risks and Responsibilities"; Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future."

<sup>21</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice"; Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration"; Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research."

<sup>22</sup> Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration."

<sup>23</sup> Igbokwe, "Artificial Intelligence in Educational Leadership: Risks and Responsibilities."

<sup>24</sup> Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future."

<sup>25</sup> Mihai Leta and Vancea, "Ethics in Education: Exploring the Ethical Implications of Artificial Intelligence Implementation"; Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications"; Barnes and Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness."

<sup>26</sup> Mihai Leta and Vancea, "Ethics in Education: Exploring the Ethical Implications of Artificial Intelligence Implementation"; Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications"; Barnes and Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness."

critical to evaluate how AI policies may reinforce gendered forms of exclusion or overlook school-based violence, particularly in contexts of structural inequality.<sup>27</sup> Addressing algorithmic bias is crucial to ensuring fairness and equity in educational outcomes.<sup>28</sup> Decolonising AI is essential to ensure that educational policies promote social justice and equity, addressing the biases present in algorithmic systems.<sup>29</sup> Transparency and accountability in AI systems are essential to building trust and maintaining ethical standards.<sup>30</sup>

## METHODOLOGY

This article reviewed research on AI in education and leadership. The systematic literature review (SLR) uses a structured and transparent approach. This method identifies, evaluates, and combines research on a topic. It is crucial for understanding current knowledge. SLRs are unlike informal reviews. They use strict protocols for objectivity and reproducibility.<sup>31</sup> The research process is illustrated in Figure 1.

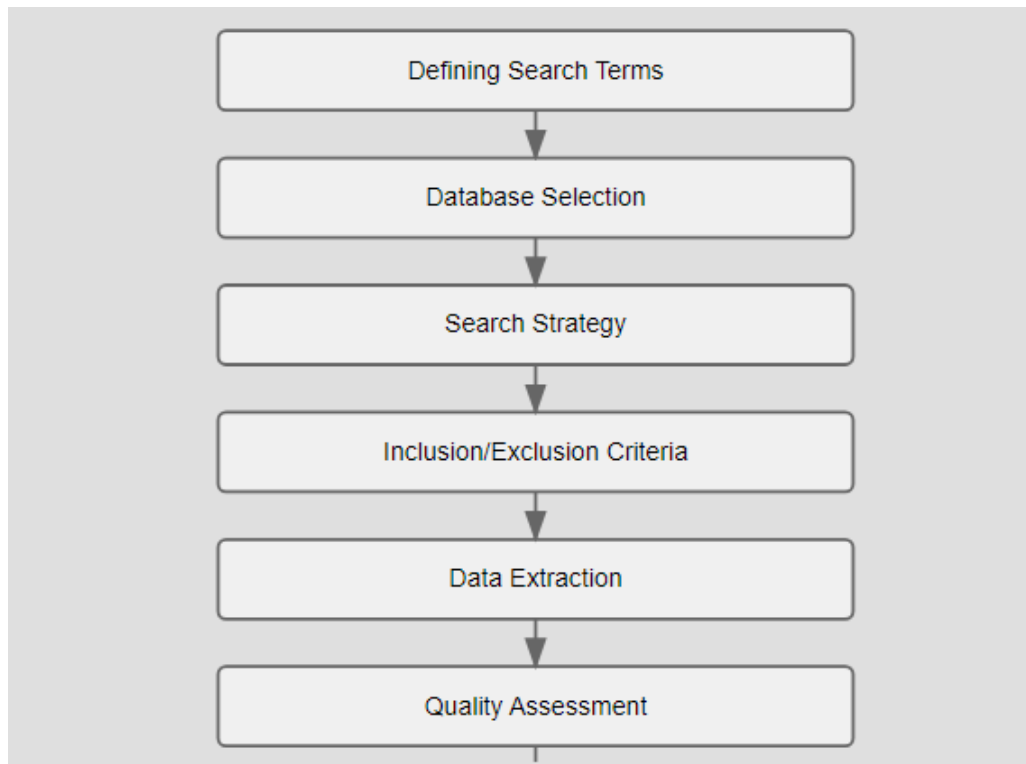


Figure 1: Research Process Flowchart

The search terms were "AI," "education," "leadership," "policy," "data," "ethics," "bias," "privacy," and "assessment." They provided a broad view of AI in education.

Databases, such as Scopus, Web of Science, ERIC, and IEEE Xplore were explored for research. These were selected for their broad coverage. Including case studies could make the findings more useful. Using keywords and Boolean operators, narrowed down the search. The focus was on peer-reviewed articles in English from 2014 to 2024. Future studies could look at older research for better insight. The study included articles that connected AI, educational leadership, and policy. Articles focusing only on AI's technical side or traditional leadership were left out. Broader perspectives could enhance understanding of AI's impact.

Key details of each article, such as methods, findings, and theories, were collected. This helped to build a clearer picture of the research landscape. More real-world examples would enrich this picture.

<sup>27</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice."

<sup>28</sup> Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications."

<sup>29</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice."

<sup>30</sup> Barnes and Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness."

<sup>31</sup> Zachary Munn et al., "Systematic Review or Scoping Review? Guidance for Authors When Choosing between a Systematic or Scoping Review Approach," *BMC Medical Research Methodology* 18, no. 1 (December 19, 2018): 143, <https://doi.org/10.1186/s12874-018-0611-x>; Mark Petticrew and Helen Roberts, *Systematic Reviews in the Social Sciences* (Wiley, 2006), <https://doi.org/10.1002/9780470754887>.

Researchers evaluated the quality of each study with standard criteria. This step ensured that only top-quality research was used. Themes, patterns, and gaps were found in the data. This helped shape the framework in this article.

## LITERATURE REVIEW

### The Role of AI in Data-Driven Educational Policymaking

Educational policymaking uses data such as student scores, teacher reviews, and demographics. However, these data can be overwhelming and difficult to analyse. AI tools can simplify this by analysing large data sets, detecting trends, and offering insights AI can find trends in student and teacher data that traditional methods may miss.<sup>32</sup> For instance, it can pinpoint areas where students struggle, helping policymakers create better support programs.<sup>33</sup> It can also highlight effective teaching methods and guide teacher training.<sup>34</sup>

Moreover, AI can predict future student numbers and graduation rates, aiding resource planning.<sup>35</sup> Recent research highlights how AI can also support equitable teacher placement by aligning staffing decisions with legal mandates for inclusive education, particularly in under-resourced communities.<sup>36</sup> This foresight helps to adapt policies to future challenges.<sup>37</sup> Using AI in policymaking leads to more evidence-based decisions, improving education outcomes.<sup>38</sup> However, there are challenges to using AI in education policies. Schools need the right infrastructure and resources, especially those with fewer funds. Training educators and policymakers is crucial to making the most of AI insights. This ensures that diverse views are considered, leading to better policies.

AI in education policy faces ethical and practical challenges. Issues like data privacy and bias in algorithms need careful attention. Data privacy is critical due to the sensitive nature of educational data. Strong rules are needed to protect these data. Bias in algorithms can lead to unfair outcomes.<sup>39</sup> It is vital to use diverse and fair data for training AI and to regularly check for biases.

Unintended consequences are also a concern. AI systems can behave unpredictably. It is important to evaluate these policies beforehand and monitor them afterwards. Practical challenges include the need for the right technology, infrastructure, and skilled people. This is tough for under-resourced schools. Training is the key to making sense of AI insights. Programs are needed to equip stakeholders with the required skills.<sup>40</sup>

Addressing these challenges requires teamwork among all stakeholders.<sup>41</sup> Open communication and shared responsibility are vital to using AI effectively in education.

<sup>32</sup> R. Kumar and M. Patel, "Breaking Barriers: Women's Leadership and Education in Developing Countries," *Journal of Global Gender Studies* 14, no. 2 (2022): 105–20; Elam, "Exploring the Challenges and Future Directions of Big Data and AI in Education"; Samman, "Harnessing Potential: Meta-Analysis of AI Integration in Higher Education."

<sup>33</sup> Akavova, Temirkhanova, and Lorsanova, "Adaptive Learning and Artificial Intelligence in the Educational Space"; Qayyum et al., "Enhancing Social-Emotional Skills in Early Childhood Education-A Comparative Analysis"; Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations."

<sup>34</sup> Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations"; Ou, "Transforming Education: The Evolving Role of Artificial Intelligence in The Students Academic Performance"; Dodi Sukmayadi, "Empowering STEM Education: Navigating Challenges and Embracing Innovations," *International Journal of Research in STEM Education* 5, no. 2 (November 12, 2023): 104–12, <https://doi.org/10.33830/ijrse.v5i2.1630>.

<sup>35</sup> Ou, "Transforming Education: The Evolving Role of Artificial Intelligence in The Students Academic Performance."

<sup>36</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice."

<sup>37</sup> Samman, "Harnessing Potential: Meta-Analysis of AI Integration in Higher Education"; Ou, "Transforming Education: The Evolving Role of Artificial Intelligence in The Students Academic Performance."

<sup>38</sup> Prabhakar and Lee, "Holistic Approaches to Music Genre Classification Using Efficient Transfer and Deep Learning Techniques"; Elam, "Exploring the Challenges and Future Directions of Big Data and AI in Education"; Samman, "Harnessing Potential: Meta-Analysis of AI Integration in Higher Education."

<sup>39</sup> Mihai Leta and Vancea, "Ethics in Education: Exploring the Ethical Implications of Artificial Intelligence Implementation"; Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations"; Barnes and Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness"; Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications."

<sup>40</sup> Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations"; Igbokwe, "Artificial Intelligence in Educational Leadership: Risks and Responsibilities"; Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future."

<sup>41</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice"; Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration"; Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research."

## Addressing Ethical and Practical Challenges

Integrating AI into educational policy faces ethical and practical challenges. Key issues include data privacy and algorithmic bias.<sup>42</sup> Protecting sensitive educational data requires strong governance.<sup>43</sup> Ensuring that AI data are unbiased and regularly audited is crucial.<sup>44</sup> The unintended consequences of AI systems also need attention.<sup>45</sup>

## Practical Challenges

Implementing AI policies demands the right technology, infrastructure, and skilled people.<sup>46</sup> This is tough for under-resourced educational systems. Training for educators and policymakers on AI insights is vital. It should empower them to make informed decisions. Tackling these challenges needs collaboration among all stakeholders. Open communication and shared responsibility are key.<sup>47</sup>

## A Framework for AI-Enhanced Educational Policies

The framework for AI-driven educational leadership offers a solid base for creating AI-enhanced educational policies.<sup>48</sup> It aims to weave AI technologies into policymaking, boosting decision-making and outcomes. With four key parts, inputs, processes, outputs, and feedback, it provides a clear method for this integration.<sup>49</sup>

In the "inputs" part, diverse, high-quality data sources are crucial for informing policies. Policymakers should use not only traditional educational data but also economic indicators, social trends, and international best practices.<sup>50</sup> This broad data approach helps them to understand the educational landscape more deeply.

The "processes" part highlights using AI tools to analyse and interpret data. Advanced statistical methods, machine learning, and data visualisation are key to extracting insights from complex datasets.<sup>51</sup> These tools help identify patterns that guide effective policy development. In the "outputs" part, the focus is on creating evidence-based policies for specific educational challenges. Such policies must be effective, equitable, and meet all learners' needs. The foundation of data and research decisions leads to better educational outcomes.

The "feedback" part stresses continuous monitoring and evaluating policy impacts. AI tools track progress and highlight areas that need improvement. This ongoing feedback loop ensures that AI-

<sup>42</sup> Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications"; Barnes and Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness"; Slimi and Villarejo Carballido, "Navigating the Ethical Challenges of Artificial Intelligence in Higher Education: An Analysis of Seven Global AI Ethics Policies."

<sup>43</sup> Mihai Leta and Vancea, "Ethics in Education: Exploring the Ethical Implications of Artificial Intelligence Implementation"; Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations"; Iman Cahyanto, "Privacy Challenges in Using Wearable Technology in Education Literature Review," *Formosa Journal of Applied Sciences* 2, no. 6 (June 10, 2023): 909–28, <https://doi.org/10.55927/fjas.v2i6.4272>.

<sup>44</sup> Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications"; Barnes and Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness"; Slimi and Villarejo Carballido, "Navigating the Ethical Challenges of Artificial Intelligence in Higher Education: An Analysis of Seven Global AI Ethics Policies."

<sup>45</sup> Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations"; Igbokwe, "Artificial Intelligence in Educational Leadership: Risks and Responsibilities"; Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future."

<sup>46</sup> Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations"; Igbokwe, "Artificial Intelligence in Educational Leadership: Risks and Responsibilities"; Jacques, Moss, and Garger, "A Synthesis of AI in Higher Education: Shaping the Future."

<sup>47</sup> Ranuharja et al., "Relevance and Impact of Generative AI in Vocational Instructional Material Design: A Systematic Literature Review"; Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration"; Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research."

<sup>48</sup> Ranuharja et al., "Relevance and Impact of Generative AI in Vocational Instructional Material Design: A Systematic Literature Review."

<sup>49</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice."

<sup>50</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice"; Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration"; Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research."

<sup>51</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice"; Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration"; Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research."

enhanced policies remain effective and responsive to changes.<sup>52</sup> Adjusting policies dynamically meets evolving educational demands.

### The Cyclical Nature of the AI-Driven Educational Policy Framework

The AI-Driven Educational Policy Framework, shown in Figure 2, works in cycles. This approach makes policy development and execution dynamic and repetitive. It ensures that educational policies adapt to changing needs and situations. Each part of the framework influences the others, creating a system that improves itself.

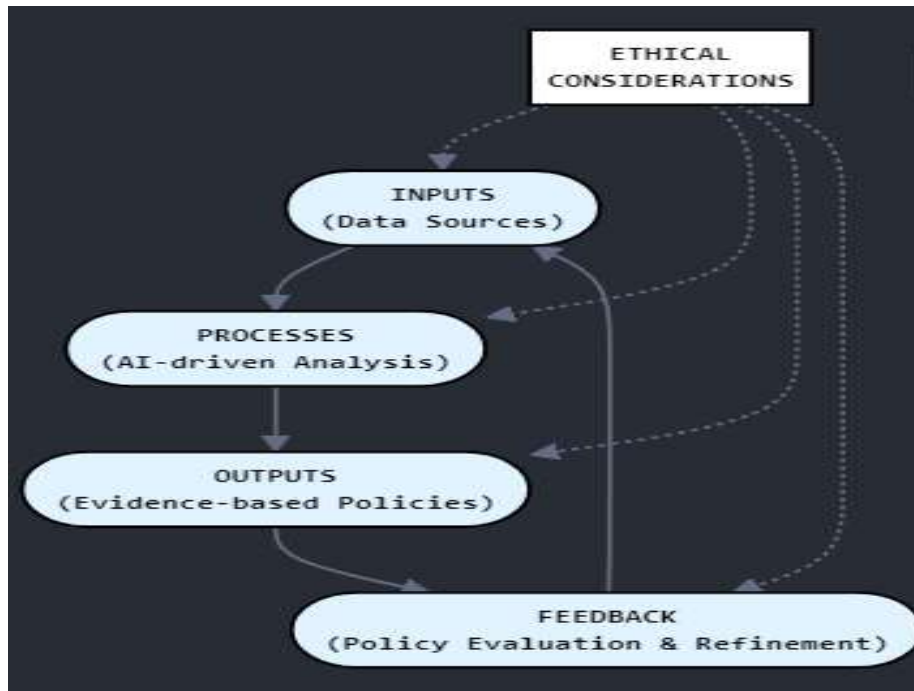


Figure 2: The Cyclical Nature of the AI-Driven Educational Policy Framework

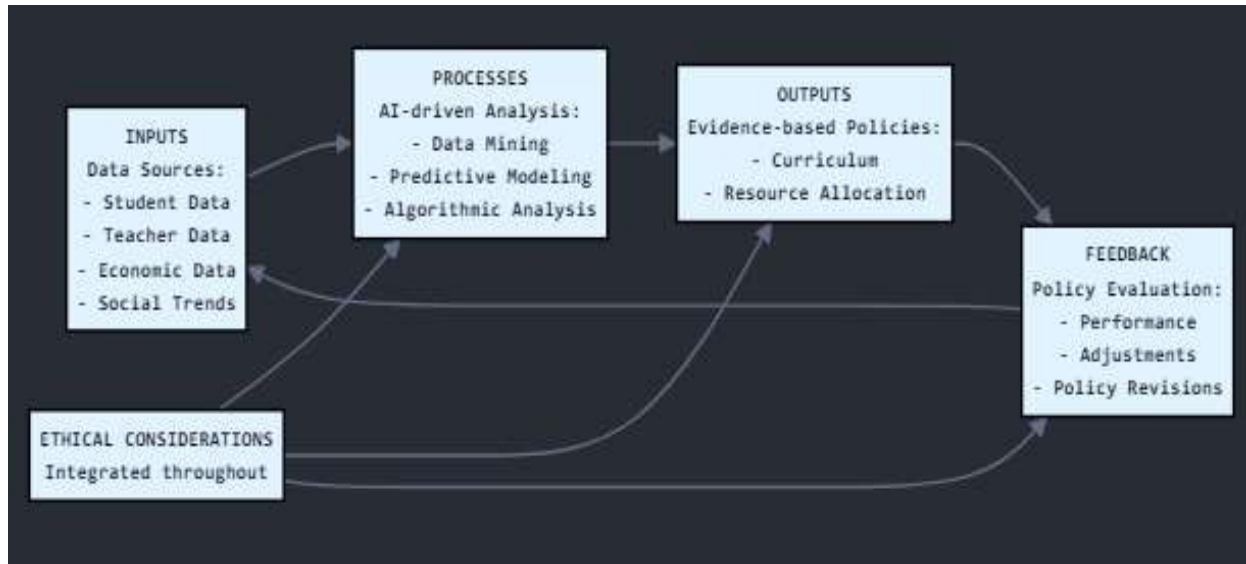
The AI-driven educational policy framework has four stages: input, processing, output, and feedback. First, it gathers data from traditional and new sources, such as learning analytics. These data are vital to make policy decisions. The AI then analyses these data to spot patterns and trends. It transforms raw data into useful insights for policymaking. The framework then creates policies to solve education problems. These policies are based on data insights and aim to meet learners' needs. They cover areas such as resource distribution and curriculum design. Finally, the feedback stage assesses the impact of the policy. AI monitors progress and recommends changes. This keeps the policies effective and aligned with the needs. Ethics are considered at every stage. This includes data privacy, fairness, and equal outcomes. It ensures the responsible use of AI.

The cyclical nature of the framework allows quick policy updates. Adjustments are made based on feedback and new data. This keeps the policies relevant and effective. By linking data, analysis, policy making, and feedback, the framework ensures that policies meet needs and maintain educational standards.

### Information flow within the AI-Driven Educational Policy Framework

Diagram 2 offers a detailed look at the framework's components. It shows data sources, AI analysis methods, policy areas, and feedback systems. This adds depth to the overview in Diagram 1, enhancing understanding of the framework's operation.

<sup>52</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice"; Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration"; Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research."



**Figure 3: Information flow within the AI-Driven Educational Policy Framework**

This framework, created by Langeveldt in 2024, aims to merge diverse data sources for policymaking. Consider educational metrics, economic indicators, social trends, and global practices as 'inputs'.<sup>53</sup> AI tools analyse these data in the "processes" stage. They use advanced methods to turn data into insights. These insights help identify trends and intervention areas. The "Outputs" phase develops policies based on evidence. These policies focus on curriculum and resources, ensuring meet learners' needs. The "Feedback" component ensures an ongoing evaluation. AI tracks progress and suggests improvements. This keeps policies effective and responsive. Ethical considerations are central. They focus on data privacy, fairness, and equal outcomes. The cyclical framework, shown in Figure 3, depicts a self-improving system.

## DISCUSSION OF FINDINGS

A review of the literature on AI in education has revealed several key insights.

**Personalisation of Learning Experience:** AI can customise education to meet individual needs.<sup>54</sup> For instance, Qureshi's study indicated a 25% improvement in learning outcomes with AI systems. However, concerns about bias and equity persist.<sup>55</sup>

**Teacher Support and Pedagogical Enhancement:** AI tools improve teaching effectiveness, saving teachers 6-8 hours per week on administrative tasks, thus allowing more time for instruction. However, adequate training and support are essential.<sup>56</sup>

**Data-Driven Policy Making:** AI improves policy decisions through advanced analytics.<sup>57</sup> For example, Samman identified connections between resources and student success, leading to more effective policies.

<sup>53</sup> Dean Collin Langeveldt, "AI-Driven Leadership: A Conceptual Framework for Educational Decision-Making in the AI Era," *E-Journal of Humanities, Arts and Social Sciences*, August 30, 2024, 1582–95, <https://doi.org/10.38159/ehass.20245812>.

<sup>54</sup> Akavova, Temirkhanova, and Lorsanova, "Adaptive Learning and Artificial Intelligence in the Educational Space"; Qayyum et al., "Enhancing Social-Emotional Skills in Early Childhood Education-A Comparative Analysis"; Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations."

<sup>55</sup> Barnes and Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness"; Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications."

<sup>56</sup> Akavova, Temirkhanova, and Lorsanova, "Adaptive Learning and Artificial Intelligence in the Educational Space"; Chima, Onyebuchi, and Idowu, "Integrating AI in Education: Opportunities, Challenges, and Ethical Considerations"; Ou, "Transforming Education: The Evolving Role of Artificial Intelligence in The Students Academic Performance."

<sup>57</sup> Pradeep Kumar et al., "Advancing Education and Cultural Heritage Through Innovative AI Techniques: A Bibliometric Analysis," in *2023 1st DMIHER International Conference on Artificial Intelligence in Education and Industry 4.0 (IDICAIEI)* (IEEE, 2023), 1–6, <https://doi.org/10.1109/IDICAIEI58380.2023.10406977>; Elam, "Exploring the Challenges and Future Directions of Big Data and AI in Education"; Samman, "Harnessing Potential: Meta-Analysis of AI Integration in Higher Education."

**Ethical Considerations and Implementation Challenges:** Significant ethical concerns must be addressed.<sup>58</sup> Privacy is a major issue, necessitating robust protections, while algorithmic bias remains a risk.

**Stakeholder Collaboration and Implementation Success:** Collaboration is crucial for successful AI implementation.<sup>59</sup> Institutions that involve all stakeholders typically achieve better outcomes.

**Resource Implications and Infrastructure Requirements:** AI requires a substantial initial investment, but can lead to cost reductions over time, underscoring the importance of scalable strategies.

**Impact on Educational Results:** The effects of AI on educational outcomes are mixed; some studies report improvements while others do not, indicating the need for a nuanced understanding.

In summary, AI has the potential to transform education, but careful consideration of various factors is necessary. Further research is essential to understand its long-term effects.

## RECOMMENDATIONS

To effectively integrate AI into education, several key recommendations have emerged from the research. First, it is essential to safeguard student data. Schools must establish robust policies to prevent data breaches, ensuring that sensitive information remains secure. This is particularly important given the increasing reliance on digital tools and platforms in education.

Prevention of bias is another critical area. Schools must utilise diverse data sets to mitigate bias in AI systems. Regular assessments can help identify potential issues and maintain fairness in grading, and other educational outcomes. This proactive approach is vital to ensure that AI technologies do not inadvertently perpetuate existing inequalities.

Comprehensive training in artificial intelligence is crucial for teachers. Workshops and courses can enhance their skills, enabling them to effectively leverage AI to support student success. By equipping educators with the necessary knowledge and tools, schools can maximise the benefits of AI while minimising potential drawbacks.

Collaboration is also vital for the successful implementation of AI. Schools must promote discussions among teachers, administrators, and technology experts. Regular meetings can improve communication and ensure that all stakeholders are aligned in their goals and strategies. This collaborative approach promotes a more cohesive and effective integration of AI into the educational system.

Policy reviews should be conducted routinely to ensure that AI policies address current needs and improve student benefits. This ongoing evaluation allows schools to adapt to evolving requirements and make necessary adjustments to their AI strategies.

Investment in technology and staffing is necessary to support AI integration. Adequate funding ensures that schools have the resources needed to implement and maintain AI systems. Flexible planning will allow schools to adapt to changing circumstances and technological advancements.

Ethical standards must be upheld in the use of AI in education. Establishing clear guidelines will promote responsible practices and ensure that AI is used fairly and transparently. This commitment to ethical standards is essential to build trust and maintain the integrity of the educational system.

Finally, ongoing research is important to understand the impact of AI. Schools must remain receptive to new technologies and potential partnerships. Continuous research will help educators stay informed about trends and innovations, allowing them to make data-driven decisions that improve educational outcomes.

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<sup>58</sup> Mihai Leta and Vancea, "Ethics in Education: Exploring the Ethical Implications of Artificial Intelligence Implementation"; Chinta et al., "FairAIED: Navigating Fairness, Bias, and Ethics in Educational AI Applications"; Barnes and Hutson, "Navigating the Ethical Terrain of AI in Higher Education: Strategies for Mitigating Bias and Promoting Fairness."

<sup>59</sup> Langeveldt and Pietersen, "Decolonising AI: A Critical Approach to Education and Social Justice"; Elabied, "Collaborative Leadership With AI: New Paradigms in University Administration"; Halomoan et al., "Integrating Principal Leadership and Teacher Roles with AI-Based 'Merdeka' Curriculum Innovation: The Quantitative Research."

By implementing these strategies, we can foster a more equitable education system that uses AI to improve the outcomes for all students.

## CONCLUSION

Artificial intelligence in education policy presents both opportunities and challenges. Although it improves decision-making, personalises learning, and improves policies, it also raises important concerns about data privacy and bias. To navigate these complexities successfully, we require adequate resources and comprehensive training. Collaboration is essential to make meaningful progress. A well-structured strategy that emphasises data quality and fairness is vital. Policies must incorporate feedback mechanisms to remain effective and relevant. As AI continues to play an increasingly important role in education, educators must adopt a proactive approach to ensure both fairness and effectiveness. This initiative entails addressing ethical challenges, overcoming barriers, and fostering teamwork. Continuous research is essential to comprehend the evolving impact of AI. By staying informed about trends and cultivating partnerships, users of AI can achieve significant advances. The findings of the literature review highlight the potential of AI to personalise learning experiences, support teachers, and drive data-driven policymaking. However, ethical considerations and practical challenges must be addressed, such as data privacy, algorithmic bias, and the need for adequate infrastructure and training. The proposed framework for AI-enhanced educational policies provides a structured approach to integrating AI into policymaking. It emphasises the importance of diverse data sources, advanced analytical tools, evidence-based policies, and continuous feedback. This cyclical framework ensures that policies remain adaptive and responsive to changing educational needs. AI has the potential to transform education, but its successful integration requires careful planning, ethical considerations, and collaborative efforts. By implementing the recommended strategies and continuously researching AI's impact, we can create a more equitable and effective education system that benefits all learners.

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### **ABOUT AUTHOR**

Dean Collin Langeveldt, PhD. Lecturer at Sol Plaatje University, Kimberley, South Africa. His research interests include teaching and learning in practice, educational leadership, management, and education law. He employs theories such as Freirean critical pedagogy, feminist pedagogy, and techno-rationalism in his work. His research aligns with several Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education), SDG 5 (Gender Equality), and SDG 16 (Peace, Justice, and Strong Institutions). He has addressed topics such as bullying, inclusive education, pre-service teacher education, and educational leadership and management. He has numerous academic publications in these areas.