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*by* Mohammed Anbar

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Assignment Report: Literature Review Enhancing the Digital Education Using Artificial Intelligence Techniques

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#### Summary of research paper's

**Paper1:** Forecasting students' adaptability in online entrepreneurship education using modified ensemble machine learning model.

This paper discovered that although all students satisfieably met the course objectives, conventional classroom participants reported greater results than their online counterparts. In spite of this, online learners showed flexibility and a greater inclination to become entrepreneurs, suggesting that their involvement had a favorable impact on their professional goals. Rather than the distribution mechanism itself, the educational strategies employed in the online format were found to be responsible for the variations in perceived effectiveness. Adding active learning techniques to online courses could enhance their performance. The study advances knowledge of the function of technology in entrepreneurship education and makes recommendations for future research on a mobile platform to help companies with marketing and international interaction.

**Paper2:** Prediction of Prospective Mathematics Teachers' Academic Success in Entering Graduate Education by Using Back-Propagation Neural Network

This paper investigates a neural network-based method that uses artificial neural networks (ANN) to forecast the academic performance of aspiring elementary math teachers in graduate school. Two distinct back-propagation neural networks (BPNN) were used. The first one predicted results from third-year vocational courses by using input scores from core courses (such General Mathematics and Linear Algebra) taken in the first two years. In order to make predictions, the second network combined the results of every course with the Academic Personnel and Postgraduate Education Entrance Exam (ALES) score. The first network achieved an accuracy of 77.125%, whereas the second network achieved an accuracy of 68.5%, demonstrating that the BPNN model produced correct predictions. Interestingly, there was no discernible relationship between ALES results and graduate average scores. These results imply that BPNN is useful for forecasting academic achievement in education majors, allowing student career counselors to spot students who might pursue graduate work and adjust their support plans appropriately.

**Paper3:** Sustainable Development of Distance Learning in Continuing Adult Education: The Impact of Artificial Intelligence

This paper Findings might soon become antiquated due to AI's speedy progress. Future studies should examine how AI will affect remote learning in the long run, deal with ethical and

technical concerns, and assess how well teacher preparation programs are working. Furthermore, examining how AI affects various demographic groups in adult education may provide insightful information. All things considered, even if AI has a lot of promise to revolutionize adult education, these obstacles must be overcome in order to reach its full potential. Because AI is developing so quickly, results could soon become antiquated. Future studies should address technological and ethical concerns, examine the long-term effects of AI in distance learning, and assess how well educator preparation programs work. It may also be worthwhile to look into how AI affects various demographic groups in adult education. All things considered, although AI offers enormous promise for revolutionizing adult education, these obstacles must be overcome in order to fully realize its potential.

#### Paper4: Applying Artificial Intelligence in Physical Education and Future Perspectives

The integration of artificial intelligence (AI) into physical education (PE) is vital for enhancing student development and modernizing educational practices. AI facilitates personalized learning by assessing individual athletic abilities and providing real-time feedback, which optimizes student performance and engagement. It also removes traditional barriers, allowing students greater flexibility in their PE choices. Additionally, AI supports educators by streamlining administrative tasks and offering insights into class dynamics, enabling more effective teaching. This transformative technology not only enriches the learning experience but also fosters the development of innovative, high-quality talent in the evolving landscape of sports education.

#### Paper5: Artificial Intelligence: A Universal Virtual Tool to Augment Tutoring in Higher Education

Addressing both intellectual and emotional issues requires the creation of emotional artificial intelligence (AI) systems that are customized to each student's needs. These solutions ought to be adaptable, enabling users to participate in the settings and at their own speed while simultaneously offering emotional trauma assistance. In order to make sure that the technologies not only help users but also encourage ethical growth in the users themselves, developers must give ethical issues top priority. These systems have the potential to yield large long-term advantages, despite the possibility of initial expenses and unclear returns. The use case for a student evaluation system that uses AI modeling—more especially, Generative Adversarial Networks (GANs) and machine learning algorithms for predictive modeling—is shown in this study. Using supervised learning techniques, the system achieves an accuracy of roughly 58%.

#### Paper6: Artificial intelligence in teaching and learning: what questions should we ask of ChatGPT?

This editorial discusses the release of ChatGPT, an accessible form of artificial intelligence, and its impact on interactive learning environments. While much of the current focus is on potential risks, such as students using ChatGPT to write essays, the editorial emphasizes the importance of critically examining the questions we ask about technology in education. It aims to explore these questions and highlight areas of inquiry that could help educators better understand the relationship between AI and learning.

**Critical Analysis:**

A thorough strategy for improving learning outcomes, customizing educational experiences, and forecasting academic achievement is presented in the research presented in the six papers on the use of artificial intelligence (AI) in education. The positives include a significant emphasis on engagement and adaptation, especially in Papers 1, 4 and 6, which show how AI may improve learning in both traditional classroom settings and online entrepreneurial education. These studies demonstrate AI's potential to enhance educational practices by utilizing rigorous approaches such as performance evaluations and predictive modeling.

But there are several significant flaws that need to be addressed. For example, while online students demonstrated flexibility, traditional classroom students expressed greater satisfaction (Paper 1), indicating that the instructional approaches employed in online formats require additional improvement. Furthermore, Papers 2 and 5 highlight the prediction models' shortcomings, especially the lack of association between academic achievement and entrance exam results, which could mask the larger success-influencing factors.

**Connections**

1. Focus on AI Integration in Education: All five papers emphasize the role of artificial intelligence (AI) in enhancing educational practices, reflecting a shared interest in leveraging technology to improve learning outcomes across various educational contexts.

2. Personalization and Adaptability: A central theme in the research is the focus on personalized learning experiences. Papers 1 and 4 specifically highlight how AI can adapt to individual student needs, promoting engagement and supporting diverse learning styles.

3. Predictive Modeling and Assessment: The papers collectively address the use of predictive modeling techniques, particularly in Papers 2, 5 and 6, to assess academic success and student performance. This approach illustrates a commitment to data-driven decision-making in educational settings.

4. Ethical Considerations: The discussions in Paper 5 bring attention to the ethical implications of using emotional AI systems in education. This concern for ethics is an important connection across the research, underscoring the need for responsible implementation of AI technologies.

5. Challenges and Future Directions: The papers acknowledge various challenges in implementing AI in education, such as technical difficulties, data privacy concerns, and the necessity for proper educator training. These shared challenges highlight the need for further research to enhance the practical applicability and effectiveness of AI in educational environments.

**Conflicts between the findings**

1. Online vs. Traditional Learning Effectiveness: According to Paper 1, students in traditional classroom environments expressed greater satisfaction and achieved better results than their online counterparts. This finding contradicts the flexibility exhibited by online learners, indicating that although they might be highly engaged and motivated to pursue entrepreneurship, their general satisfaction might fall short, pointing to a possible disparity in perceived efficacy.

2. Accuracy of the Predictive Model vs. Entrance Exam Correlation: In Paper 2, the back-propagation neural network model predicted academic performance based on course results with a high accuracy of 77.129 percent. It also revealed no discernible relationship between entry exam results and graduate average scores, casting doubt on the reliability of utilizing these tests as success indicators. According to this, typical assessment metrics do not fully capture the variables affecting academic performance, even though predictive modeling can be useful.

3. Ethical Implications vs. Technological Advancement: Paper 5 highlights the necessity for responsible implementation and ethical considerations while creating emotional AI systems. It also highlights potential biases. The other studies, on the other hand, tend to downplay the ethical issues that can surface from the broad use of these technologies in favor of concentrating more on the advantages and technical developments of AI in education.

4. Implementation Challenges: Papers 3 and 4 address a number of implementation-related issues, including technological issues and the requirement for thorough training for teachers. There is disagreement over the viability of these advancements because different studies emphasize these difficulties to differing degrees, with some expressing more positive opinions about the incorporation of AI in educational settings than others.

5. Applications of AI: While some studies, like studies 1, 3 and 6, examine how AI might be used in particular educational contexts (adult education and entrepreneurship), others, like Paper 5, concentrate on more general uses, such emotional support. This disparity in scope may lead to divergent opinions regarding the general usefulness and effects of AI in education, implying that studies that focus more narrowly may produce different results than those that examine AI's application in various contexts.

#### Synthesis Matrix for Literature Review

| Study                                                                                                                            | reference | Authors     | Year | Research Design         | Methodology                            | Key Findings/Results                                                                                                                    | Limitations                                                                |
|----------------------------------------------------------------------------------------------------------------------------------|-----------|-------------|------|-------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| Forecasting<br>10<br>students' adaptability in online entrepreneurship education using modified ensemble machine learning model. | [1]       | Malik et al | 2023 | Comparative Study       | Surveys and performance evaluations    | Online students showed adaptability and a desire to pursue entrepreneurship, but reported lower satisfaction than traditional students. | Limited to specific educational contexts; focus on version number attacks. |
| 2<br>Prediction of Prospective Mathematics Teachers' Academic Success in Entering Graduate Education by Using Back-              | [2]       | Bahadir     | 2016 | Neural Network Analysis | 14<br>Back-propagation Neural Networks | Back-propagation neural networks accurately predicted academic success, but no correlation was found with entrance exam scores.         | Limited sample size; potential biases in data collection.                  |

|                                                                                                                     |     |                                                  |      |                              |                                        |                                                                                                                                   |                                                                                                    |
|---------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------|------|------------------------------|----------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|
| Propagation Neural Network                                                                                          |     |                                                  |      |                              |                                        |                                                                                                                                   |                                                                                                    |
| 1 Sustainable Development of Distance Learning in Continuing Adult Education: The Impact of Artificial Intelligence | [3] | 1 Edwards-Fapohunda, M. O., & Adediji, M. A. (). | 2024 | Qualitative and Quantitative | Surveys, interviews, and data analysis | AI enhances learner engagement and accessibility, but challenges include technical difficulties and data privacy concerns.        | Small sample size; reliance on self-reported data.                                                 |
| 9 Applying Artificial Intelligence in Physical Education and Future Perspectives                                    | [4] | Lee, H. S., & Lee, J.                            | 2021 | Review and Case Studies      | Literature review and case analysis    | AI personalizes learning and optimizes performance in physical education, removing traditional barriers for students.             | Generalizability issues; specific to physical education contexts.                                  |
| 5 Artificial Intelligence: A Universal Virtual Tool to Augment Tutoring in Higher Education                         | [5] | Hemachandran et al                               | 2022 | Use Case Analysis            | Use case development and analysis      | Emotional AI systems can address academic and emotional challenges, but ethical implications and biases need further exploration. | Lack of empirical testing; focuses mainly on theoretical aspects.                                  |
| 6 Artificial intelligence in teaching and learning: what questions should we ask of ChatGPT?                        | [6] | Rospigliosi                                      | 2023 | Use Case Analysis            | Editorial/Conceptual analysis          | The editorial explores ChatGPT's impact on education, focusing on its potential risks and benefits.                               | the focus on ChatGPT's risks in education, urging a broader exploration of its potential benefits. |

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