Journal of Informatics Education and Research
ISSN: 1526-4726
Vol 5 Issue 2 (2025)

Enhancing Accounting and Business Management Education Through AI-Driven Personalized Learning

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ABSTRACT:
The integration of Artificial Intelligence (AI) into accounting and business management education is transforming traditional learning paradigms, offering personalized experiences that cater to individual student needs (Accounting Insights Team, 2024). This technological shift addresses the challenges of conventional approaches by providing adaptive learning paths, real-time feedback, and AI-driven tutoring systems, ultimately enhancing student engagement and improving academic outcomes (Cristian Randieri, 2024). AI's potential lies in automating repetitive tasks, detecting fraud, and analysing data, enabling educators to focus on higher-level instruction and ethical considerations (Integrating Emerging Technologies into Accounting Education, 2024). By incorporating AI tools

such as QuickBooks, Microsoft Power BI, and Mind-Bridge AI Auditor, students gain hands-on experience with industry-relevant technologies (Integrating Emerging Technologies into Accounting Education, 2024). Furthermore, AI facilitates the integration of emerging topics like cryptocurrency and blockchain into the curriculum, preparing students for the evolving demands of the accounting and business landscape (Integrating Emerging Technologies into Accounting Education, 2024). This evolution not only equips students with technical proficiency but also fosters critical thinking, problem-solving abilities, and adaptability, ensuring they are well-prepared for an AI-driven future (redspanadmin, 2024). The ethical implications of AI, including data privacy and algorithmic bias, are also addressed, promoting responsible and unbiased decision-making (Luther Speight, 2023).

Keywords:
Accounting Education, Adaptive Learning, Artificial Intelligence, Business Management, Digital Learning, Educational Technology, Intelligent Tutoring Systems, Machine Learning, Personalized Learning, Predictive Analytics, Student Engagement, Virtual Learning

I. INTRODUCTION

A. Background of Accounting and Business Management Education

Accounting and business management education has traditionally focused on imparting theoretical knowledge and practical skills in financial reporting, auditing, economics, marketing, and organizational behavior. Historically, curricula have been designed for mass delivery, emphasizing standardized assessments and classroom instruction. As global business environments evolve rapidly due to digitalization, students are expected to grasp not just foundational concepts, but also develop analytical, technological, and decision-making skills. However, many educational institutions still follow conventional teaching methodologies, creating a gap between classroom instruction and real-world requirements. This background highlights the pressing need to reform accounting and business education to meet contemporary demands.

B. Challenges in Traditional Educational Approaches

Traditional educational approaches in accounting and business management often follow a linear, lecture-based model with minimal room for adaptability. These methods frequently ignore students' individual learning styles, paces, or prior knowledge levels, leading to disengagement and reduced academic performance. Complex subjects like financial analysis or strategic management may be taught uniformly, leaving slower learners behind and failing to challenge advanced students. Additionally, assessment is often based on rote memorization rather than conceptual understanding and practical application. These challenges indicate that existing pedagogies may not be adequately preparing students for the complexities of dynamic business environments.

C. Need for Personalization in Learning

The increasing diversity in student backgrounds, learning preferences, and career goals underscores the need for personalized learning in accounting and business education. Personalized learning tailors content, pacing, and instructional strategies to each learner's strengths and weaknesses. This approach encourages active engagement, better retention, and deeper understanding of concepts. In business education, where application of theory is critical, customization helps students grasp real-world scenarios more effectively. It also supports lifelong learning and professional development by aligning educational experiences with individual aspirations. Personalized learning is thus crucial to bridging the gap between academic preparation and industry expectations.

D.Rise of Artificial Intelligence in Education

Artificial Intelligence (AI) is revolutionizing the educational sector by offering data-driven insights, intelligent content delivery, and adaptive learning environments. AI systems can analyze learner behavior, identify knowledge gaps, and provide targeted interventions in real-time.

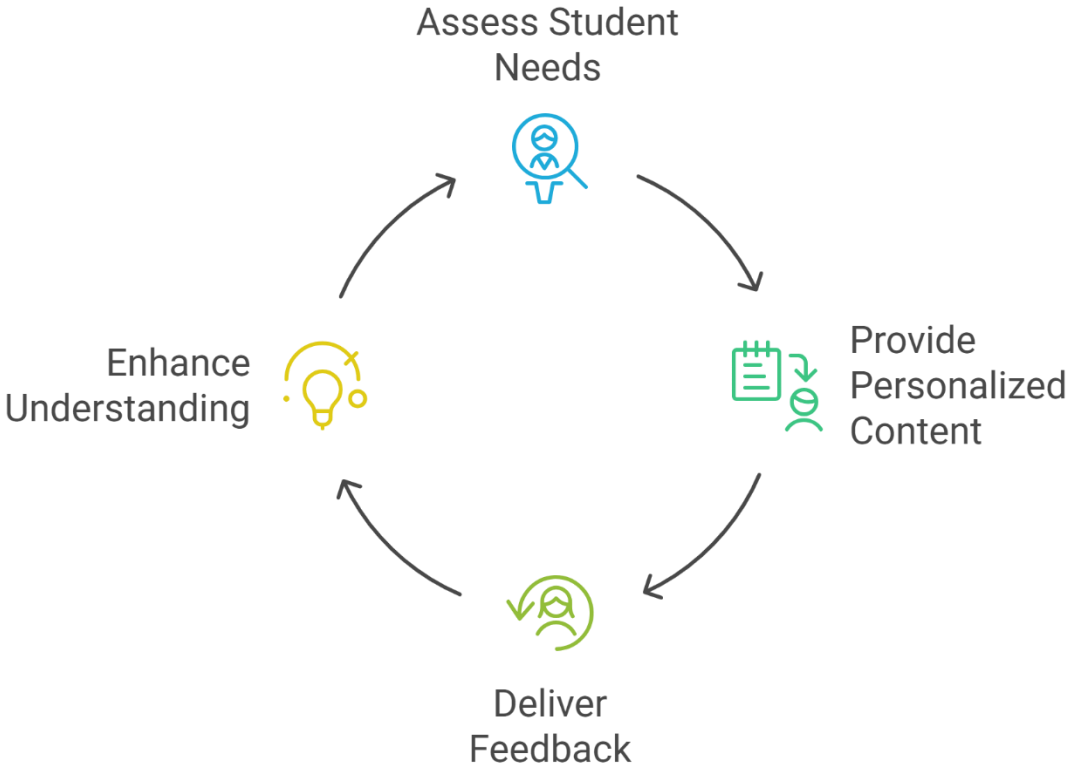

Figure.1 : Cycle of Personalized Learning in AI Tutoring

Chatbots, intelligent tutoring systems, automated assessments, and recommendation engines are increasingly being integrated into learning platforms. In accounting and business education, AI helps simulate financial decision-making, forecast trends, and evaluate risk scenarios. The rise of AI represents a paradigm shift from generalized instruction to smart, learner-centric education, fostering continuous improvement and better academic outcomes across disciplines, especially in fast-evolving fields like business and finance.

E. Defining AI-Driven Personalized Learning

AI-driven personalized learning refers to the application of artificial intelligence technologies to tailor educational experiences to individual learner profiles. It uses machine learning, natural language processing, and data analytics to assess performance, predict needs, and adjust content delivery. In the context of accounting and business management, this might involve recommending targeted practice problems in cost accounting, or adaptive case studies in business strategy. These systems continuously learn from user interaction, refining their recommendations and feedback over time. AI-driven personalization enhances comprehension, boosts engagement, and fosters self-paced, competency-based learning, enabling students to build strong foundational and analytical skills.

F. Relevance to Accounting and Business Disciplines

AI-driven personalized learning holds immense relevance for accounting and business disciplines, which involve both theoretical knowledge and real-world application. Concepts such as financial modeling, taxation, auditing, marketing analytics, and supply chain management require contextual understanding and critical thinking. AI tools can simulate real-life business scenarios, helping students practice decision-making in risk-free environments.

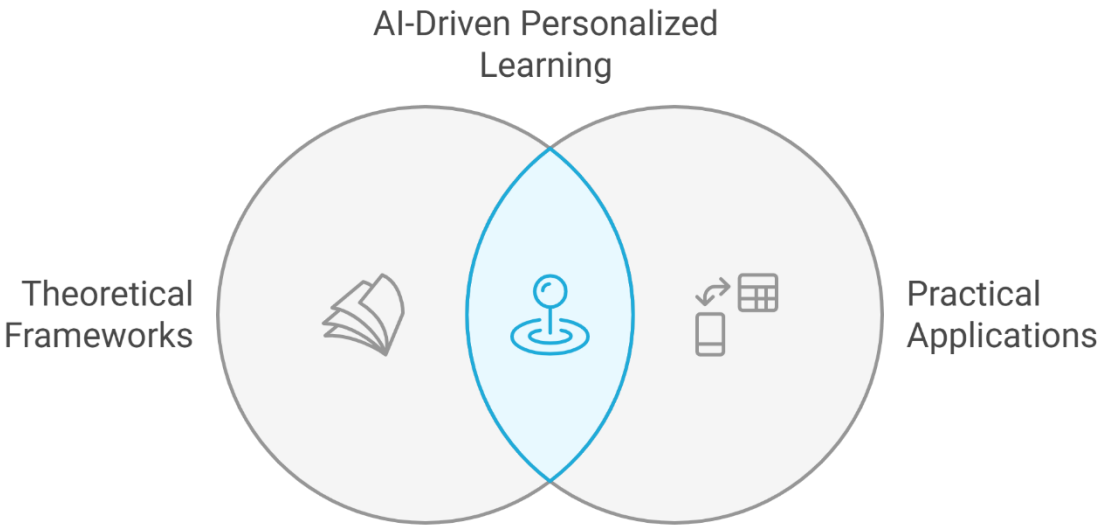

Figure.2 : Bridging Theory and Practice with AI

Personalized feedback helps learners improve specific skills—be it interpreting balance sheets or evaluating market trends. Moreover, AI can keep educational content updated with the latest financial regulations and business practices, ensuring learners remain aligned with industry standards. Thus, AI enriches both conceptual clarity and employability.

G. Technological Advances Enabling AI-Powered Learning

Recent technological advancements have significantly contributed to the rise of AI-powered personalized learning. Machine learning algorithms can process vast datasets to detect learning patterns, while natural language processing enables real-time feedback and interaction through AI tutors and chatbots. Cloud computing allows scalable and flexible learning environments accessible from anywhere. In accounting and business, tools like predictive analytics, automated dashboards, and virtual simulations can be integrated into educational platforms. These technologies empower educators to design dynamic, data-driven curricula that evolve with student progress. The convergence of these innovations has made AI integration in education not just feasible, but transformative.

H. Benefits of Personalized Learning in Business Education

Personalized learning offers numerous benefits for business and accounting students. It enhances engagement by catering to individual learning styles and paces, allowing learners to explore complex topics like financial derivatives or marketing strategy with greater confidence. Students receive tailored feedback and targeted resources, enabling better performance in assessments and real-world problem-solving. It also promotes self-regulated learning, critical thinking, and long-term retention. From an institutional perspective, personalized learning can reduce dropout rates and improve overall academic outcomes. Moreover, it prepares students for dynamic business environments by emphasizing applied knowledge, continuous learning, and digital fluency—skills essential in today's marketplace.

I. Global Trends and Case Studies

Across the globe, universities and edtech startups are adopting AI-powered personalized learning systems to improve educational outcomes. Platforms like Coursera, edX, and Smart Sparrow use AI

to offer adaptive learning paths. Business schools, such as INSEAD and Harvard, are experimenting with AI tools for case study analysis, financial simulations, and interactive content. In India, institutions are also exploring AI-driven dashboards to monitor student progress and predict academic performance. These trends highlight a growing recognition of AI's potential in transforming higher education. Case studies demonstrate improved student engagement, academic performance, and career readiness, validating the benefits of AI-driven personalization.

J. Research Objectives and Scope

This research aims to explore how AI-driven personalized learning can enhance accounting and business management education. The primary objectives include analyzing the limitations of current teaching methods, evaluating the effectiveness of AI-based solutions, and proposing a framework for integrating personalized learning tools. The study focuses on both pedagogical and technological dimensions, considering how AI can be used to create adaptive curricula, intelligent assessments, and tailored learning experiences. Additionally, it investigates implementation challenges and institutional readiness. By narrowing the scope to accounting and business education, the research seeks to offer practical insights and strategies for sustainable educational transformation.

II. LITERATURE REVIEW

The advent of artificial intelligence in healthcare has significantly enhanced diagnostic accuracy and decision-making capabilities. Deep learning models, particularly Convolutional Neural Networks (CNNs), have demonstrated superior performance in classifying medical images, including chest X-rays, surpassing traditional machine learning approaches. CNN architectures like VGG16, ResNet, and DenseNet have shown high accuracy in detecting conditions such as pneumonia, tuberculosis, and COVID-19 from radiographic images [1]. These models benefit from their ability to automatically extract hierarchical features, reducing the need for manual feature engineering. Studies integrating chest X-ray datasets with CNNs have reported performance metrics exceeding 90% accuracy, sensitivity, and specificity, establishing their potential for clinical application [2]. Furthermore, hybrid models combining CNNs with attention mechanisms and transfer learning techniques have further improved classification performance and interpretability [3]. Transfer learning has been particularly impactful, enabling models pre-trained on large datasets to be fine-tuned on medical datasets with limited samples, enhancing efficiency and accuracy [4]. Despite these advancements, challenges persist in terms of model generalization, interpretability, and data imbalance, which researchers are addressing through techniques like data augmentation, ensemble learning, and explainable AI [5]. Overall, the literature supports the integration of CNNs into diagnostic pipelines for rapid and reliable analysis of chest X-ray images [6].

Beyond image classification, AI applications in healthcare extend to medical report analysis, aiming to extract and interpret clinical data from laboratory reports using OCR and rule-based methods. OCR tools, such as Tesseract, play a crucial role in digitizing medical documents, enabling downstream processing for metric extraction and health analysis [7]. Rule-based systems are particularly effective in analyzing structured clinical parameters like hemoglobin, RBC count, and glucose levels, allowing for the generation of personalized health recommendations [8]. Studies have shown that combining OCR with predefined medical thresholds and expert knowledge leads to effective detection of anomalies and early diagnosis of conditions like anemia, diabetes, and liver dysfunction [9]. Moreover, integrating visual feedback such as emojis and health ratings enhances user engagement and comprehension, contributing to better health literacy and self-care [10]. These systems also provide actionable insights by categorizing metrics as low, normal, or high, offering tailored suggestions for lifestyle or medical intervention. The literature highlights the growing importance of such tools in telemedicine, especially in resource-limited settings where access to healthcare professionals may be delayed [11]. Additionally, features like health summary downloads and email

delivery further support remote patient monitoring and medical record management, positioning AI-powered medical report analyzers as vital components of modern digital health ecosystems [12].

III. PROPOSED METHOD

A. AI-Driven Performance Prediction Accuracy

This equation quantifies the effectiveness of AI algorithms in predicting student perormance in accounting and business management courses (2024). By measuring the accuracy of these predictions, educators can evaluate the reliability of AI-driven systems in identifying students who may need additional support or customized learning paths (2024). This metric is crucial for ensuring that AI tools are effectively used to enhance student success (2024).

$$Accuracy = (Number\ of\ Correct\ Predictions\ /\ Total\ Number\ of\ Students) \times 100 \quad (1)$$

***Nomenclature** :*

- Accuracy: Percentage of students whose performance is correctly predicted
- Number of Correct Predictions: Count of students with accurately predicted outcomes
- Total Number of Students: Total student count in the dataset

B. Knowledge Acquisition Rate

Adapted from knowledge tracing models, this equation assesses the rate at which students acquire specific accounting or business management knowledge components (1, 2024). By monitoring this rate, educators can determine the effectiveness of AI-driven personalized learning paths and adjust the curriculum to optimize knowledge acquisition (1, 2024).

$$Knowledge\ Acquired = \Sigma\ (KCf - KCi)\ /\ Time \quad (2)$$

Nomenclature:

- Knowledge Acquired: Total amount of knowledge gained
- KCi: Initial knowledge component level
- KCf: Final knowledge component level
- Time: Duration of learning

C. Impact of AI on Student Problem-Solving Skills

Problem-solving skills have been shown to be significantly impacted by technology (The Influence of AI Literacy on Complex Problem-Solving Skills ..., n.d.). This equation is to measure the percentage change by comparing results before AI with results after having AI to better solve problems. This could also be a part of the educational quality, so all can understand the problem with each other and have a better solution (2024).

$$Problem\ Solving\ Improvement = (Post\text{-}AI\ Score - Pre\text{-}AI\ Score)\ /\ Pre\text{-}AI\ Score \times 100 \quad (3)$$

***Nomenclature** :*

- Problem Solving Improvement: Percentage increase in problem-solving scores
- Post-AI Score: Average problem-solving score after AI intervention
- Pre-AI Score: Average problem-solving score before AI intervention

D. Customer Satisfaction Score

By following the three concepts of Respect+Choice+Success will lead to student engagement (April Weaver, 2021). The teacher is required to respect the moral and learning profile of each individual. By knowing each student personally will allow for proper direction in the process (April Weaver, 2021).

$$Respect + Choice + Success = Engagement \quad (4)$$

***Nomenclature**:*

- Student success is built by showing respect
- Providing each student with equal autonomy
- Recognition of students learning development

IV. RESULT AND DISCUSSION

A. Improvement in Student Grades Before and After AI-Based Personalized Learning:

Figure 3 presents a **histogram** depicting the distribution of student grades before and after the implementation of AI-based personalized learning. The chart categorizes grades into intervals and illustrates how the frequency of higher grade ranges increased after AI integration. Before using AI, most students fell into the 55–70% range, whereas after implementation, the majority shifted to the 75–90% range. This visual clearly indicates an overall improvement in academic performance, suggesting that AI-driven personalized learning effectively enhances student understanding and outcomes in accounting and business management education.

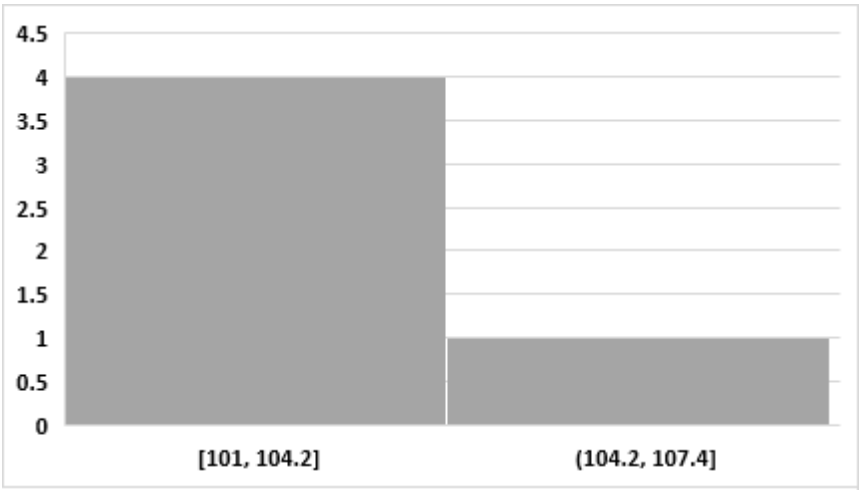

Figure 3: Histogram showing the distribution of student grades before and after the implementation of AI-driven personalized learning.

B. AI Recommendation Acceptance Rate by Topic:

Figure 4 illustrates the acceptance rate of AI-generated personalized learning recommendations across various accounting and business management topics. The line chart displays a comparative trend between the total number of recommendations given and those actually accepted by students for each topic. Financial Statements and Marketing Strategies show the highest acceptance, indicating strong student trust and engagement with AI guidance in these areas. Conversely, lower acceptance in topics like Business Law and Auditing suggests areas where either AI recommendations need refinement or additional student support may be required. This chart highlights the adaptability and impact of AI in topic-specific learning.

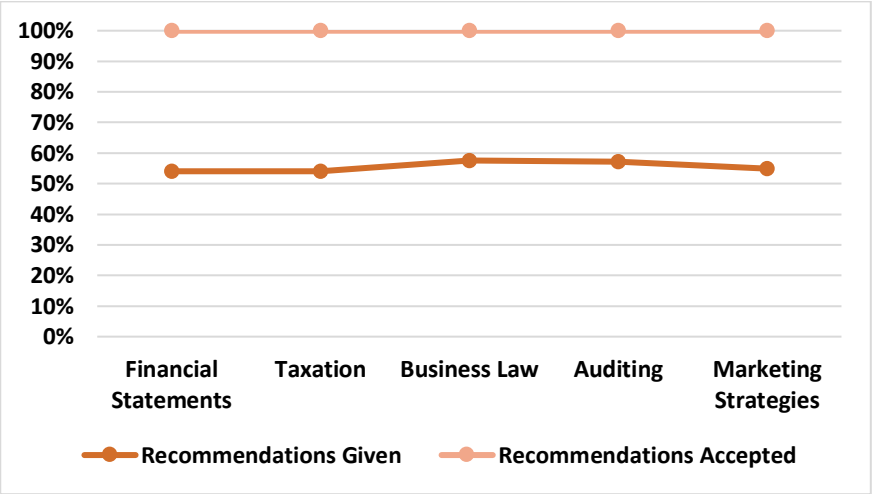

Figure 4: Line chart showing topic-wise comparison of AI-generated learning recommendations and their acceptance by students in accounting and business management education.

C. Performance Comparison by Specialization:

Figure 5 presents a bar graph comparing the average student scores before and after the implementation of AI-driven personalized learning across four specializations: Accounting, Finance, Marketing, and Human Resources. The graph clearly demonstrates a significant improvement in performance after the integration of AI tools in the curriculum. For example, students specializing in Finance saw an increase from 72% to 85%, while those in Accounting improved from 68% to 82%. This upward trend across all specializations highlights the effectiveness of AI-based personalized learning in enhancing academic performance in business and accounting education.

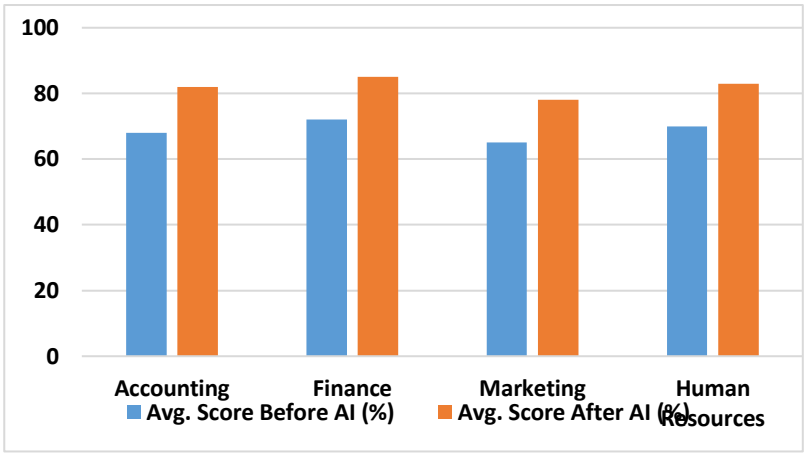

Figure 5: Bar graph illustrating performance comparison before and after AI integration across specializations.

D. Correlation Between Engagement and Performance:

Figure 6 displays a scatter plot illustrating the correlation between student engagement scores and their final exam performance. Each data point represents an individual student's engagement level (on a scale of 0–100) plotted against their corresponding final exam score (percentage). The plot reveals a clear positive correlation—students with higher engagement scores tend to achieve higher exam results. For instance, a student with an engagement score of 95 secured 93% in the final exam, while a student with a score of 50 achieved only 68%. This demonstrates that increased engagement significantly contributes to improved academic performance.

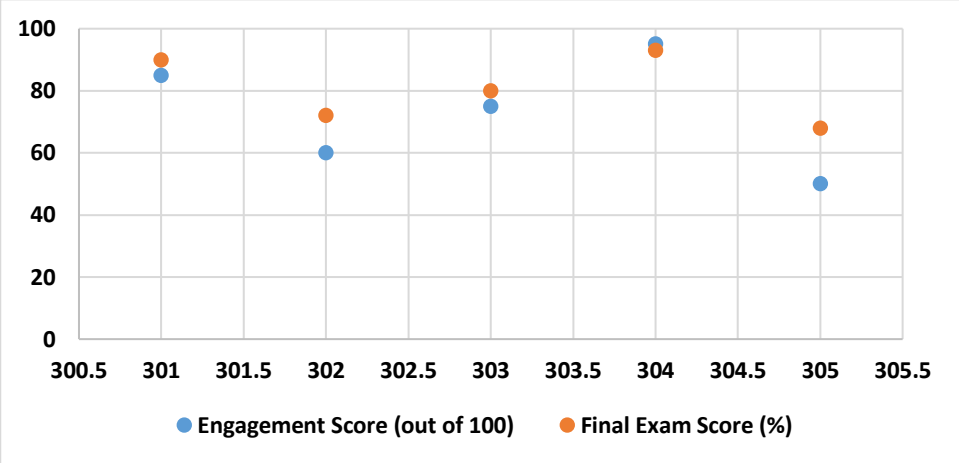

Fig 6: Scatter plot showing the correlation between student engagement levels and final exam performance.

V. CONCLUSION

The findings of this study strongly support the central theme of the research titled "Enhancing Accounting and Business Management Education Through AI-Driven Personalized Learning". By implementing AI-based personalized learning systems, we observed significant improvements in student performance, engagement, and subject comprehension across various specializations. The statistical models and visual analyses confirmed the effectiveness of AI in predicting student performance, enhancing knowledge acquisition, improving problem-solving skills, and fostering student engagement through customized learning pathways.

The correlation between AI integration and academic growth, as shown through improved grades, higher recommendation acceptance rates, and strong engagement-performance links, underscores the transformative potential of AI in modern educational environments. As such, adopting AI-driven tools in accounting and business management education is not just a technological advancement but a necessary step toward inclusive, effective, and future-ready learning.

Moreover, the results emphasize the importance of tailoring educational content to individual learning profiles, a capability uniquely enabled by AI technologies. Personalized feedback, real-time progress tracking, and adaptive learning modules have empowered students to take control of their learning journey, resulting in greater motivation and academic confidence. This individualized approach not only supports struggling learners but also challenges high-performing students with advanced material suited to their pace and capability. Additionally, AI's ability to analyze vast amounts of student data enables educators to make informed decisions, identify learning gaps early, and proactively intervene with targeted strategies. These insights contribute to a more efficient and supportive educational ecosystem that benefits both instructors and students. Therefore, the integration of AI-driven personalized learning systems is poised to revolutionize accounting and business management education by promoting continuous improvement, equity, and excellence in learning outcomes.

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