



Artificial Intelligence in accounting and finance education: Enhancing teaching and learning for business transformation and economic growth

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Abstract

There are three main types of modifications that can be introduced concerning artificial intelligence in accounting and finance. First, AI creates intelligent learning environments which facilitate personalized and adaptive learning. Secondly, AI enables automation of the assessment process to provide timely feedback. Thirdly, AI gives learners an opportunity to analyze information regarding their learning process in real time. However, despite the development outlined above, some educational institutions continue to use conventional methods of teaching since those do not foster development of digital skills. For this reason, this paper will focus on the role of AI technologies in education, accounting and finance, and their effectiveness and outcomes.

For the analysis of the topic under consideration, quantitative and qualitative methods for collection of empirical evidence were employed. Therefore, questionnaires were distributed among 132 students and 22 lecturers from IBSUniversity and Port Moresby Business College. All collected data was analyzed using descriptive statistics and reliability of scales was confirmed through correlation analysis and regressions. As a result, the presence of high levels of AI awareness was identified among both students and teachers. Moreover, chatbots turned out to be the most popular tool.

Cronbach Alpha test has shown that all scales used in the research turned out to be reliable. In addition, the research has revealed that AI learning factors demonstrate considerable predictive validity in respect of the efficacy of teaching. The most important predicting factor is students' interaction with AI technologies. Barriers to using AI technologies include insufficient training, technical issues and ethical concerns.

Keywords: Artificial Intelligence, finance education, ai-enabled learning, educational technology, curriculum innovation digital transformation, student engagement, teaching effectiveness, accounting education, learning analytics, ai-based assessment, intelligent tutoring systems, workforce readiness, digital skills development, business transformation, higher education.

1. Introduction

Today, one of the most innovative technologies ever invented relates to artificial intelligence. Technologies such as machine learning, robotic process automation, natural language processing, and predictive analytics are extensively applied to auditing, fraud detection, financial forecasting, and risk management in accounting and finance (Kokina & Davenport, 2017; Sutton et al., 2016; Al-Htaybat, K., & von Alberti-Alhtaybat, L. 2017).

This means that professionals in accounting and finance should be prepared for such changes and develop novel methods of working. The demands for graduates of accounting and finance become higher and their knowledge related to AI plays a significant role (Pan et al., 2021; Frey & Osborne, 2017).

Most universities adhere to conventional methods of educating people and organize lectures and classes using textbooks. This might not be an efficient method of preparing for future life in the era of emerging technologies. Besides, AI provides numerous opportunities to improve the experience gained during learning by helping solve realistic tasks and receive personalized feedback.

There are some difficulties which impede the implementation of AI in education. Such difficulties include insufficient faculty training, technical problems, and a lack of control over the use of artificial intelligence. Therefore, the present research is centered on the application of AI technologies in education related to accounting and finance and its effects on efficiency.

2. Statement of the problem

The pace at which technology develops rapidly and creates numerous innovative solutions for businesses around the world, the field of education related to accounting and finance does not change significantly. The way education occurs is not altered and includes the use of conventional methods of education such as regular lectures, book learning, and methods of assessment. Considering the innovations related to technologies, including implementation of AI in all aspects of conducting finances operations, universities ignore the necessity to educate their graduates properly.

Therefore, a gap between theory and practice arises. However, new technologies provide numerous opportunities for enhancement of the process of education. Application of AI can be incorporated in the process and used as a tool to make education more efficient for accounting and finance students by making use of applications like big data analytics, automation, prediction, assessment, etc. Although the introduction of AI in the process of teaching makes positive changes concerning student engagement, motivation, and performance, there is not enough literature related to the subject matter.

There are no existing studies which can explain how educators can incorporate the AI tools into their classes, what the framework related to teaching with the help of AI looks like and whether the process can improve efficiency of the learning. To get answers to the questions raised, it is important to research the current situation related to implementation of AI.

3. Research objectives

1. To assess current applications of artificial intelligence (AI) technology in education for accounting and finance.
2. To measure the impact of using AI methods of instruction on competencies and employment.
3. To uncover potential obstacles to implementing artificial intelligence in educational processes.
4. To create a novel approach to using AI in education with a view to promoting entrepreneurship and economic development.

4. Literature review

In this future literature review, the main sources will consist of peer-reviewed journals, reports from reliable organizations and conferences, and publications of professional bodies in accounting. The sources to be reviewed include UNESCO (2023) and OECD (2021) publications. Four distinct topics will be included in literature surveys on the issue: application of AI technology in higher education; adoption of artificial intelligence in the education of accounting and finance; evaluation using AI technology; and skill development and career opportunities.

4.1 Artificial Intelligence and its role in Higher Education

Significantly greater attention was paid to the potential of applying artificial intelligence technologies as an important tool for improving effectiveness of the learning process. AI technologies provide personalized customized educational content for learners (Holmes et al., 2019). Various studies show that AI technologies increase engagement of students, facilitate personalized learning, provide automatic assessments, and help with intelligent tutoring and learning analytics (Luckin et al., 2016; Ifenthaler & Yau, 2020). As Zawacki-Richter et al. (2019) state, there is abundant evidence proving that the introduction of AI technologies contributes considerably to personalization of the learning process as well as to effective academic

management. Furthermore, Chui, et. al (2016) examine the possibilities of implementing AI in education and its challenges.

4.2 Implementation of Artificial Intelligence technologies in education on accounting and finance

It goes without saying that now more artificial intelligence technologies, including predictive analytics tools, robotic process automation simulators and AI financial models are applied in the sphere of education on accounting and finance (Kokina & Davenport, 2017). As has already been mentioned above, artificial intelligence technologies help students understand how to construct realistic financial scenarios that are extremely important nowadays for accountants' digital skills development (Pan et al., 2021). Sutton et al. (2016) noted that artificial intelligence technologies would revolutionize accounting because of audit automation and advanced analysis of financial information. At the same time, Cockcroft and Russell (2018) maintained that artificial intelligence technologies changed dramatically the field of accounting due to big data analytics.

4.3 Artificial Intelligence for assessments and learning analytics

AI-based automatic assessment technology allows automatic marking and continuous monitoring of progress during instruction and providing feedback to learners (Siemens & Baker, 2012). AI-based learning analytics technology makes it possible for instructors to evaluate learning progress of their learners and develop effective intervention strategies (Ifenthaler & Yau, 2020; Brynjolfsson & McAfee 2017). Kasneci et al. (2023) argue that generative AI technology represented by ChatGPT can be successfully used to support education, but it should be kept in mind that these technologies raised issues related to ethics and academic integrity.

4.4 Skill and career development

As the result of applying artificial intelligence, the analytical and decision-making skills of students will be significantly improved during the learning process. Modern corporations need employees who would apply modern technologies for analysis of financial data and taking decisions (Davenport, 2018).

4.5 Research Gaps

It should be admitted that there are several gaps in existing literature on artificial intelligence. First, almost all papers exploring the topic under consideration focus on analyzing the technological aspect of artificial intelligence but ignore its influence on pedagogical processes including teaching and learning. Secondly, even though there are numerous papers dealing with adoption of artificial intelligence in developed countries, there is only a little literature devoted to adoption of AI in less-developed countries that possess totally different infrastructure and digital skills. Thirdly,

though there are plenty of papers researching students' perceptions of technology application, there are few articles studying perceptions of both learners and instructors in this regard. Fourthly, nowadays there are no theoretical models available for educators to integrate AI into the learning process. These gaps will be eliminated in this paper.

5. Theoretical framework:

The following three theoretical frameworks are used to prove this research paper:

5.1 Constructivist Learning Theory: Constructivist Learning Theory assumes that knowledge is acquired through learning, experiences and reflection. AI systems for learning enable acquiring knowledge via simulations, feedback and adaptations (Piaget, 1972; Papert, 1991).

5.2 Bloom's Taxonomy: The framework describes educational objectives in the hierarchy starting from memory and comprehension up to application, analysis, evaluation, and creating. From the viewpoint of introduction of AI in education, it will make it possible to develop cognitive skills including critical thinking, personalization, problem solving, and creativity (Bloom et al., 1956; Anderson & Krathwohl, 2001).

5.3 Technology Acceptance Model (TAM): Technology Acceptance Model (TAM) reveals how technology is adopted and used depending on perception of its usefulness, ease of use, etc. TAM will be helpful to investigate attitudes of students and lecturers toward adoption of AI technology (Davis, 1989).

6. Research methodology

6.1 Research design

The current exploratory research utilized a mixed method that combined qualitative and quantitative surveys.

6.2 Sample - The data was collected from the following respondents' groups:

Table 1. Respondent group and sample size

Respondent Group	Sample Size
Students	132
Lecturers	22
Total	154

Source: Compiled by the authors from primary data.

6.3 Data collection

Data were gathered by using:

- Structured questionnaires
- Interviews
- Learning management system analytics

6.4 Data analysis techniques

The following statistical techniques were used:

- Percentage analysis
- Descriptive statistics
- Cronbach's Alpha reliability test
- Correlation analysis
- Multiple regression analysis

7. Hypotheses: Based on the literature study and considering the research objectives, the following hypotheses have been developed.

H1: Awareness of AI technology has a positive effect on use of AI technology in accounting and finance education.

H2: Use of AI technology in learning processes has a significant effect on student engagement in accounting and finance learning.

H3: AI technology learning factors significantly influence teaching effectiveness.

H4: Student engagement via use of AI technology has a positive effect on students' skills development.

H5: Insufficiencies of training and infrastructure negatively influence AI adoption in higher education.

8. Statistical investigation and result

8.1 Reliability analysis

Table 2. Reliability Analysis

Variable	Cronbach's Alpha	Interpretation
Teachers' AI factors	0.751	Reliable
Students AI factors	0.860	Highly reliable

Source: Compiled from primary data.

The following results have been derived: Alpha coefficients for teachers and students' responses are equal to 0.751 and 0.860 respectively. According to statistics, which is regarded as one of the leading criteria for estimating the reliability level of the coefficient, the latter needs to exceed the

level of 0.70. With a higher level of coefficient, students are supposed to demonstrate a certain consistency while evaluating the role played by modern technologies in teaching financial and accounting courses. Being aware of the changes that took place in people's attitude towards applying modern technologies in studying process, lecturers will most likely possess various opinions on the problem.

Overall results received within the framework of reliability analysis can serve as good ground for further conducting correlation and regression analysis.

8.2 Correlation analysis

Table 3. Correlation analysis

Variables	Teaching Effectiveness	Student Engagement	AI Awareness
Teaching Effectiveness	1		
Student Engagement	0.61	1	
AI Awareness	0.52	0.58	1

Source: Compiled from primary data.

The following associations were detected between the mentioned variables. Firstly, the relationship between student engagement and teaching effectiveness proves to be positive ($r = 0.61$). It means that an increase in the level of student engagement leads to an increase in the level of teaching effectiveness. Hence, it can be assumed that the use of interactive AI-based tools for improving learning outcomes will lead to the improvement of teaching effectiveness.

Another correlation exists between AI knowledge and teaching efficiency ($r = 0.52$). Considering the relation mentioned above, it can be concluded that people with high levels of AI knowledge perceive teaching efficiency better than others do.

Finally, there is an association between AI awareness and student engagement ($r = 0.58$). How can it be interpreted? Of course, AI awareness contributes to the increase of student engagement due to digital opportunities.

Summarizing all the information provided above, it should be noted that correlation analysis revealed that AI awareness and student engagement have positive effects on teaching effectiveness. Therefore, increasing AI awareness will help to improve teaching effectiveness.

8.3 Multiple regression analysis

Table 4. Model summary

R	R ²	Adjusted R ²	F	Sig
0.696	0.484	0.363	3.985	0.018

Source: Compiled from primary data.

Interpretation: It should be noted that, according to the result of regression analysis, the value of the coefficient of correlation (R) will be equal to 0.696. Thus, the relationship between the dependent variables and a set of independent variables is quite high.

According to the coefficient of determination ($R^2 = 0.484$), it should be concluded that the teacher success rate depends on the set of factors associated with artificial intelligence to 48.4%. The adjusted R^2 shows that the part of the variance in the success rate of teachers that corresponds to the set of independent variables is used in regression analysis.

The significance of the F-statistics equal to 0.018 proves that there is a statistical significance of the regression model. The value of 0.018 is below 0.05. It is possible to conclude that the null hypothesis about the impact of these factors should be rejected.

In general, it can be stated that AI-based learning factors have a positive impact on the process of education.

9. Hypothesis Testing

Hypothesis 1

H1: Awareness of AI technology has a positive effect on use of AI technology in accounting and finance education.

Table 5. Awareness level of AI among respondents

Awareness Level	Students (n=132)	Percentage	Lecturers (n=22)	Percentage
Very High	60	45.45%	5	22.73%
High	36	27.27%	14	63.64%
Moderate	36	27.27%	0	0%
Low	0	0%	3	13.64%
Very Low	0	0%	0	0%

Source: Compiled from primary data.

Interpretation: As many learners have high or very high awareness of AI, it can be stated that awareness is important for prompting respondents to use AI tools in education. Thus, H1 is accepted.

Hypothesis 2

H2: Use of AI technology in learning processes has a significant effect on student engagement in accounting and finance learning.

Table 6. Students' perception of AI-Based learning

Factor	Mean	Standard Deviation
AI tools useful in understanding accounting concepts	3.45	1.23
AI tools make learning more engaging	3.53	1.09
Confidence in using AI tools	3.37	1.16
AI tools are easy to use	3.79	1.14
Interest in AI-based learning	3.56	1.17
AI improves academic performance	3.32	1.21
Recommend AI tools to peers	3.38	1.19

Source: Compiled from primary data.

Interpretation: The results of the analysis show that all mean scores are above the unbiased midpoint (3.0) which means that students have positive knowledge of AI-based learning platforms. Subsequently, AI tools improve student engagement and learning experience. Therefore, H2 is accepted.

Hypothesis 3

H3: AI technology learning factors significantly influence teaching effectiveness.

This hypothesis was tested using multiple regression analysis.

Table 7. Model summary for regression analysis

Model	R	R ²	Adjusted R ²	F	Sig
1	0.696	0.484	0.363	3.985	0.018

Source: Compiled by the authors from primary data.

Interpretation: As a result of regression analysis, learning parameters related to AI influence the effectiveness of education. Firstly, due to the result of regression analysis, there are positive correlations among the variables, with AI related learning parameters, and teaching efficiency. The relationship among the variables is moderate, with $r=0.696$.

Secondly, from the result of R squared value ($R^2=0.484$), the effect of AI related learning parameters can account for 48.4% of the efficiency of teaching variation.

Finally, from the result of value of F statistic ($F=3.985$) below 0.05, and significance level of 0.018, the regression model used was found to be statistically significant. As a result, AI improved educational environment positively impacts the efficiency of teaching. H3 is supported.

Table 8. Regression coefficients

Independent Variable	Beta (β)	Std Error	t	p-value	Result
Student Engagement	0.637	0.207	3.396	0.003	Significant
Assessment Methods	-0.178	0.293	-0.843	0.411	Not Significant
Critical Thinking	-0.151	0.261	-0.747	0.465	Not Significant
Content Delivery	0.206	0.199	1.006	0.328	Not Significant

Source: Compiled from primary data.

Interpretation: From all independent variables tested in the regression model, only student engagement turned out to be statistically significant ($p = 0.003$). This proves that AI-driven engagement significantly increases teaching efficiency

Hypothesis 4

H4: Student engagement via use of AI technology has a positive effect on students' skills development

Table 9. Students' perception of AI-Based skill development

Skill	Agree	Neutral	Disagree
Analytical Skills	42	30	20
Problem Solving Skills	43	28	19
Interpretation Skills	42	34	21
Decision Making Skills	38	35	24

Source: Compiled from primary data.

Interpretation: Based on the findings, it should be stated that there is a relation between the use of AI-based tools and the skills development of the learners both for academic and professional needs. Most respondents stated that using the AI-based tools, they managed to develop certain skills for analytics and for interpreting financial data. Both skills are extremely important for accounting and finance. Students have opportunities to hone their skills by applying these tools.

However, neutral positions of students indicate that students' attitudes toward the tools in question may depend on their knowledge about AI technologies. Regardless of the significant potential of the AI-based tools for helping students to acquire the needed skills, these tools vary greatly in terms of the effectiveness of their use depending on the mode chosen.

Hypothesis 5

H5: Insufficiencies of training and infrastructure negatively influence AI adoption in higher education.

This hypothesis explores whether *institutional and technical difficulties* such as lack of AI training, inadequate infrastructure, and technological attitude influence AI adoption in accounting and finance education. The hypothesis is examined using *frequency and percentage analysis of experiments reported by lecturers and students*.

Table 10. Challenges faced by lecturers in adopting AI tools

Challenge	Frequency	Percentage
Lack of AI knowledge and training	16	72.7%
Data privacy and ethical concerns	12	54.5%
Inadequate infrastructure	11	50.0%
Cost of AI tools	11	50.0%
Curriculum rigidity	7	31.8%
Resistance to change	5	22.7%

Source: Compiled from primary data.

Interpretation: The results show that lack of AI training is the most significant barrier to adoption of AI (72.7%). Moreover, inadequate infrastructure (50%) and cost of AI tools (50%) represent significant institutional barriers. Therefore, it can be decided that commitment of institutions is a crucial factor for successful approval of AI.

Table 11. Challenges faced by students in adopting AI tools

Challenge	Frequency
Lack of training and guidance	47
Limited access to technology	39
Data privacy concerns	36
Resistance from educators	31
Low digital literacy	29

Source: Compiled from primary data.

Interpretation: Lack of training and the insufficiency of the availability of the technologies needed are seen as significant barriers in using the technology by most of the participants (47).

Poor digital literacy skills and data privacy are also important barriers for the implementation of technology.

Therefore, according to the analysis of responses from both lecturers and students, the barriers identified include the following: lack of training and insufficiency of availability of technologies are important barriers which prevent implementing AI technologies. Thus, the hypothesis H5 is confirmed.

It is clear from the analysis of the barriers to the implementation of AI technologies that lack of training and technological skills is an important barrier to implementing AI technologies. It will pose a considerable challenge for lecturers to implement AI technologies in class due to lack of training on AI technologies.

Additionally, the lack of proper assistance and guidance will pose a serious barrier for students who would want to use AI technologies in studying. Some technological barriers, such as poor availability of infrastructure, high costs of AI technologies, and data privacy, could also pose significant barriers in using AI technologies.

Therefore, the results seem to confirm the hypothesis.

9.1 Hypothesis testing summary

Table 12. Summary of hypothesis testing results

Hypothesis	Statement	Statistical Test	Result
H1	AI awareness progressively influences AI adoption	Percentage Analysis	Accepted
H2	AI tools increase student engagement	Descriptive Statistics	Accepted
H3	AI learning factors impact teaching effectiveness	Regression Analysis	Accepted
H4	AI tools improve students' skill development	Skill Perception Analysis	Accepted
H5	Lack of training and infrastructure negatively influences AI adoption	Frequency Analysis	Accepted

Source: Compiled from primary data.

10. Discussion

Thus, it is possible to conclude that the application of AI technologies plays an important role in increasing the effectiveness of teaching and the engagement of learners in the process of studying in accounting and finance. Based on statistical analyses, the predictors of the effectiveness of teaching included AI learning factors, which served as the most significant factor, and learner

engagement. Consequently, it is fair to assume that the use of AI learning technologies increases the level of learner engagement and makes the process of learning fun.

Because of the research findings, it can be concluded that learners adopt a positive attitude towards using AI technologies. Today, there is an increase in the popularity of the use of AI assistants and chatbots as they can help solve different problems of learners. Thanks to AI assistants, learners can contact their teachers quickly and ask any questions regarding homework.

Nevertheless, when talking about the most preferable types of AI technologies for educators, financial simulators and AI assessment platforms for grading should be mentioned. These technologies can help increase the effectiveness of the teaching process and make the assessment procedure more efficient and faster.

Despite the positive attitudes of educators and learners to the use of AI in education, some issues exist, which limit the widespread application of AI as an instrument that helps learners in the process of studying. There are certain barriers that can serve as obstacles to further AI integration into higher education. According to the findings of the research presented above, such barriers as unpreparedness of educators to work with AI technologies, infrastructure barriers, and ethical considerations are likely to appear during AI integration.

11. Conceptual framework for AI adoption

After the analysis of the research findings presented above, it becomes apparent that it is necessary to elaborate a conceptual framework for effective AI adoption in accounting and finance education. The suggested framework includes six machines needed for efficient implementation of AI technologies.

1.AI awareness and training – It is crucial to organize training courses and workshops for learners and educators aimed at developing the awareness and competence of people to work with AI. This information might be helpful when adopting such technologies to education.

2.Curriculum incorporation – To make the efficient use of AI, it is required to incorporate AI technologies into the curriculum so that learners get the skills necessary for functioning in the modern environment. AI should be used to conduct financial analysis, forecast financial results, and make decisions.

3.AI learning gears – By using such AI technologies as learning platforms, intelligent tutoring, chatbots, and simulators, learners will be able to communicate with one another and gain practical experience in finance.

4.Ethics of AI technology use – It is required to provide guidelines concerning the use of AI technologies. Ethical issues are likely to arise including such aspects as privacy issues and the proper use of technology.

5.AI assessment and evaluation – The efficiency of evaluation can be enhanced by assessment systems and AI-based learning analytics. Moreover, this tool might help deliver feedback to learners.

6. Adequate institutional infrastructure – Adequate institutional infrastructure is necessary for the efficient integration of AI technologies. It implies the existence of digital platforms, high-speed Internet connection, and administrative technology.

12. Implications for business transformation and economic development

With the introduction of AI technologies in education, especially accounting and finance, the following implications are generated both concerning the transformation of businesses and economic development. This means that with the use of AI technologies, educational establishments can provide professionals who have appropriate knowledge and understanding of the use of modern technologies and analytics.

Education via the use of AI technologies may contribute to the stimulation of economic development because it helps establish a basis for creating a workforce which can implement innovations, automation, and evidence-based decision-making practices in companies. Learners who have skills related to the use of AI technologies can be responsible for introducing innovations and forming new branches such as fintech, digital banking, financial data analytics, etc.

Moreover, with education involving the use of AI, the emergence of innovations and entrepreneurial activities could occur leading to the creation of businesses that operate based on new technologies. Thus, education via AI technologies can contribute to making a country more competitive in national and international markets.

13. Limitations and Suggestions for Further Research

Nevertheless, apart from positive aspects of Artificial Intelligence use in education in the context of accounting and finance that were revealed in the current study, some limitations in this regard still need to be mentioned.

First, the limitation concerns the fact that the data collection used only two higher education institutions to conduct the study, so its findings can be generalized only in these settings.

Also, it should be noted that a small sample size used to investigate teachers' perceptions may be viewed as a limitation of this study.

Moreover, considering that only a few conclusions about the implementation of AI were formulated, this research did not provide any information concerning the impact on the effectiveness of learning activities of students who were exposed to artificial intelligence.

For further research, it is necessary to collect data from different higher education institutions as well as study the effect of using AI on students over time.

14. Conclusion

AI-powered education of accounting and finance is a resource which can generate numerous advantages for the field of education including innovative approaches to education, active involvement in educational processes, and increased effectiveness of education. As revealed in this research, the implementation of AI in education is positively perceived by students as having beneficial effects on their studies.

Use of such AI tools as chatbots, simulators, assessment techniques, etc. opens new perspectives for education. Nevertheless, to fully leverage advantages offered by AI, the following obstacles need to be addressed regarding education, technological infrastructure, and ethics.

Investment into technological infrastructure and the process of faculty development as well as the redesigning of the educational process is required to implement AI. By using this innovative approach in education, universities will ensure that their students studying accounting and finance will become efficient professionals in the modern business world.

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