Warith Scientific Journal

The Employment of Artificial Intelligence in Developing Accounting Information Systems and Its Role in Enhancing User Skills: An Applied Study of a Sample from Vocational Schools Specializing in Accounting Sciences

توظيف الذكاء الاصطناعي في تطوير نظم المعلومات المحاسبية ودوره في تعزيز مهارات المستخدمين : دراسة تطبيقية لعينة من المدارس المهنية المتخصصة في علوم المحاسبة

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Abstract

With the rapid development of technology and its new born baby-AI in accounting, the very importance lies in its introduction to upgrade quality in the accounting teaching sector particularly in schools that are vocational and are to be used for training quality personnel in the labour market. Since artificial intelligence can automatically carry out some procedures and data processes with the highest efficiency and speed with accuracy, while lowering human errors and boosting performance of user and efficiency, the impact of artificial intelligence in accounting information systems development seems so much promising. There is still some discrepancy between what the technology is able to offer theoretically and the way it has been put into application in the teaching curricula that opens a way for innovative forms of integration of these technologies into the teaching process.The purpose of this research is, among others, the application of artificial intelligence in accounting information systems development, along with its implication for the users' competencies in accounting. The study will have the theoretical part based on a deductive model while the other will depend on an inductive model by the collection of data through a questionnaire designed for the students, lecturers and bodies for higher education specializing in accounting. Those groups will represent the sample for the study while the population will consist of only vocational schools, specifically the commercial branch and accounting department. Also, this will discuss how digital transformation benefits the teaching of vocational skills and how the use of artificial intelligence in accounting systems can increase the quality of education.

Keywords: Artificial Intelligence, Accounting Information Systems, Vocational Accounting Education.

المستخلص:

مع التطور السريع للتكنولوجيا وظهور مولودها الجديد "الذكاء الاصطناعي" في مجال المحاسبة، تكمن الأهمية الكبرى في إدخاله بهدف رفع جودة التعليم في القطاع المحاسبي، وخاصة في المدارس المهنية التي تُستخدم لتدريب كوادر مؤهلة لسوق العمل. ونظرًا لأن الذكاء الاصطناعي قادر على تنفيذ بعض الإجراءات ومعالجة البيانات تلقائيًا بأعلى كفاءة وسرعة ودقة، مع تقليل الأخطاء البشرية وتعزيز أداء المستخدم وكفاءته، فإن تأثيره في تطوير نظم المعلومات المحاسبية يبدو واعدًا للغاية. ومع ذلك، لا يزال هناك تفاوت بين ما يمكن أن تقدمه التكنولوجيا نظريًا وبين كيفية تطبيقها فعليًا في المناهج التعليمية، الأمر الذي يفتح المجال أمام أشكال مبتكرة لدمج هذه التقنيات في العملية التعليمية.

يهدف هذا البحث، من بين أمور أخرى، إلى دراسة تطبيق الذكاء الاصطناعي في تطوير نظم المعلومات المحاسبية، إضافةً إلى بحث آثاره على كفاءات المستخدمين في المحاسبة. سيتضمن البحث جزءًا نظريًا قائمًا على نموذج استنباطي، بينما يعتمد الجزء الآخر على نموذج استقرائي من خلال جمع البيانات عبر استبيان مُصمم للطلاب وأعضاء هيئة التدريس والهيئات التعليمية العليا المتخصصة في المحاسبة. وتمثل هذه المجموعات عينة الدراسة، بينما يقتصر مجتمع الدراسة على المدارس المهنية، وتحديدًا الفرع التجاري وقسم المحاسبة. كما سيتناول البحث كيفية استفادة التعليم المهني من التحول الرقمي، وكيف يمكن لاستخدام الذكاء الاصطناعي في الأنظمة المحاسبية أن يرفع جودة التعليم.

الكلمات المفتاحية: الذكاء الاصطناعي، نظم المعلومات المحاسبية، التعليم المحاسبي المهني.

Introduction

Recent years, AI technology has grown rapidly in all areas of life; however, in the accounting profession, it is among the most prominent innovations that has transformed almost all industries in this millennium. It has been defined that AI is the ability of computer systems to perform tasks based on data analysis, machine learning, and decision-making by inferring information based on certain data patterns and results. With improved algorithms and deep learning methods, AI has become one of the vital tools in improving operational efficiency and the accuracy of information in financial and accounting institutions. AI plays an increasingly vital role in the field of accounting. It has now grown from just automation of the routine processes of data entry and financial reporting to include risk prediction, detection of financial fraud, and analysis of the financial performance of companies. Furthermore, AI has contributed to the advancement of accounting information systems, leading to greater accuracy in their functioning and the reduction of human errors, which means better report quality and faster and more timely decisions for a company.As such, it is an imperative for artificial intelligence integration into educational curricula, especially within vocational schools specializing in the education of accounting sciences, in preparation of a generation of accountants who will be able to manage these modern technologies.

2. Research Methodology

2.1 Research Problem

Implementing smart analysis, machine learning, and big data processing in an accounting information system is rapidly changing with ongoing technological advancements in AI. There exists a gap in the integration of these technologies into vocational schools, thus limiting the growth of students' and teachers' abilities to operate modern accounting systems. Hence this research problem is concerned with addressing the extent to which integration of artificial intelligence technologies contributes toward the development of accounting information systems in the vocational schools and the manner in which they improve the competencies of users related to accounting sciences.

2.2 Research Importance

Therefore, the need to integrate artificial intelligence technologies into the curricula of vocational education for the accountancy sciences is absolutely great, since demand nowadays requires accounting professionals to be skillful and competent in working with up-to-date accounting information systems. The study puts forward an innovative view on enhancing the vocational education system with the use of AI tools and techniques to develop students' competencies in the management of financial data.

2.3 Research Objectives

A. Framing the theoretical aspects of artificial intelligence technologies and what roles it ensures in enhancing accounting information systems.
B. Highlighting the role of artificial intelligence technologies in enhancing the skills of accounting students in vocational schools through curriculum updates.
C. Measuring the impact of artificial intelligence technologies on the final shaping of accounting information systems and their contributions towards enhancing user skills – the investigative approach.

2.4 Research Hypotheses

The following main hypotheses guide the study, according to the research problem, significance, and objectives:

1) Hypothesis One: There is a relationship between supporting artificial intelligence in developing accounting information systems and enhancing users' skills in managing and analyzing financial data.
2) Hypothesis Two: The development of AI has had a positive impact on a user's skill set in data entry, processing, and financial data analysis with greater accuracy and efficiency.

3. Previous Studies

AI has quickly become a mainstream area of study in the professional and personal spheres around the world. Within this framework, various academic papers have so far tackled different dimensions of AI. This research contained literature that presents an extensive and comprehensive description of AI in the designing of accounting information systems, thereby informing various views on the matter. Nasser & Ahmed (2019) analyze the impact of AI in delivering digital content, especially with educational robots and smart assistants. Al-Shammari & Ibrahim (2020) analyses the incorporation of AI in the design of a digital curriculum through an exploration of the utilization of deep learning for the adaptation of course material. The research establishes that AI can serve to efficiently update a curriculum with respect to advancements in knowledge and the needs of the student. Garcia & Thompson (2020) showcase the impact of AI in the establishment of digital content delivery methods, with chatbots and virtual assistants being the point of interest in the study. They conclude from the study that integration of such technologies enhances Leraning and inspire Lerner autonomy. Much in the same way, Khalid & Salem (2021) investigate AI's role in the intelligent learning system, targeting automation of assessments and exploration of student. The group found that AI provides improvement into the quality of assessments while also giving instant feedback to learners. Anderson&Lee(2021) is another work that focuses on AI applications in the digital curriculum design through deep learning techniques to customize educational contents. The findings confirm that AI plays a burden in timely curriculum updates based on developed knowledge and student needs. Al-Mousawi& Ali(2022) investigated AI role in creating digital learning environments by big data analysis in order to adjust learning to every student's

needs. Research showed that AIs engage more students and improve the process of learning. Williams&Brown(2022) studied the role of AI in the design and implementation of Intelligent Learning Systems, focusing on assessment automation and student learning behavior analysis. The research indicates that assessment with AI provides rapid feedback to learners.

The authors Ahmed & Jasim (2023) study the role of AI, particularly in the design of digital learning content and the analysis of student performance, which enhances the educational process. In conclusion, it was found that AI enhances the quality of education by adapting to the needs of individual learners and automating instructional processes, thereby improving the learning experience and promoting learner independence. Mohammed Sami & Johnson (2023), however, explored the bright future of AI in application to digital learning environments, particularly in big data analysis to develop personalized learning experiences. Their findings directed that AI has a significant impact on student engagement and improves the efficiency of digital education.

4. Artificial Intelligence

4.1 Definition of Artificial Intelligence

In computer science, it may define, in general terms, artificial intelligence (AI) as any human-like intelligence exhibited by a computer, robot, or other device. Some researchers explain it as, "the ability of computers or machines to simulate human cognitive capabilities such as learning from examples and experiences, recognizing objects, understanding and responding to language, making decisions and solving problems" (Al-Jaber, 2020). Such abilities are indicative of those employed by computers or automated devices to perform human tasks-like welcoming visitors at an inn or steering the driving wheel of a car. Some other scholars describe AI as "the synthesis of multiple technologies that allow machines to understand, act, and learn in a way similar to that of human intelligence" (Baldwin & Brown, 2006). AI is further defined as "the abilities of computers or smart devices to simulate human intelligence in learning, recognizing objects, decision-making, and problem-solving, enabling many human tasks" (Ezenwa & Uchime, 2021). Global funding for AI technologies has seen sharp increases over the years. A Tortoise Intelligence report notes that global investment grew to $77.5 billion in AI in 2021 from $36 billion in 2020 (British Arab Academy, 2019).

AI in Education

The AI is acting great in contribution towards education through teacher and student assistance. It provides smart assistants that can analyze the abilities of students and adapt the content of education to satisfy the appropriate demands of each student. Here, personalized learning will go beyond socioeconomic or geographic barriers to foster students' overall understanding and retention of facts. Moreover, AI works with teachers to lessen their workload, helping in rounds of administrative work such as grading assignments, assessing learning patterns in the school, and resolving queries on a general basis. It thereby allows more time for the teacher to conduct interactive and face-paced teaching (Mellouli & Bouslama, 2019). With every technological advancement that gets added toward it, AI stands as a protagonist behind automating and improving the learning and teaching processes in a more efficient and accessible manner.

4.2 Requirements for AI Implementation in Education

The successful integration of AI in education is contingent upon different thresholds of infrastructure that need to be met. They include but are not limited to:

- High-speed internet access, wide coverage at an affordable cost. Whereas many developed countries have succeeded in achieving this, others that are the developing ones still do struggle with furnishing such infrastructural background.
- Availability of digital equipment for AI-based educational platforms.
- Training of skilled technical staff for proper implementation and maintenance of AI-based educational systems.
- The security and the protection of data amidst the vast range of information dealt with by some Ai.Such factors will decide the effectiveness of AI in education, which will mainly depend on the very integration of such a technology within the learning environment (Al-Jaber, 2020).

5-2 Accounting Information Systems (CAIS)

5-2-1 Concept and Definition of Accounting Information Systems

Computerized Accounting Information Systems (CAIS) are fundamental pillars that organizations rely on for performing their tasks and duties. These systems integrate two distinct disciplines: **accounting** and **information systems**. CAIS represents a blend of computer technologies, human resources, and accounting standards, enhancing the availability of reliable information in a timely manner. This information is crucial for decision-making and guiding senior management toward sound strategic choices. Implementing CAIS correctly provides organizations with significant benefits, including reducing risks and minimizing the likelihood of human errors.

Several definitions of CAIS highlight its key functions and components:

- **Firdaus (2011)** defines CAIS as "an integrated set of interrelated hardware and software subsystems that work together harmoniously to process transaction data related to financial matters."
- **Marshal (2018)** describes it as "a system that collects, records, stores, and processes data to produce information for decision-makers, encompassing personnel, procedures, instructions, data, software, IT infrastructure, internal controls, and security measures."
- **Olatunji & Olusegun (2021)** define CAIS as "a financial system that employs specialized automated devices, such as computing machines and computer systems, to collect, analyze, interpret, and present financial data to users for decision-making."

Key Insights from the Definitions:

- **CAIS is the backbone of institutions worldwide, especially financial organizations.** It plays a crucial role in analyzing financial information quickly and providing accurate reports that support decision-making.
- **CAIS serves as an accounting framework** that collects, examines, measures, and processes data from both internal and external sources to generate valuable insights in compliance with regulations.
- **CAIS integrates multiple subsystems and core components** that form its architectural framework, which supports various accounting cycles and processes.

Key Components of CAIS:

CAIS consists of five essential subsystems that enable its effective operation:

1. **Internal Control Component:**
   - Responsible for ensuring system performance and optimizing operations within a company.

- Plays a crucial role in generating high-quality financial reports following established policies, regulations, and legal frameworks. *(Itang, 2021)*

2. **Automated Data Processing Component:**
   - Enables the accounting system to execute tasks and accounting operations automatically without human intervention.
   - Ensures the accuracy of financial data, processes transactions, and facilitates seamless budget reconciliation. *(Ghasemi et al., 2011)*
3. **Relational Database Component:**
   - Manages data storage, maintenance, and retrieval within the system.
   - A relational database is defined as *"a collection of centrally coordinated, electronically stored tables with minimal redundancy." (Marshal, 2021)*
   - A well-structured database maintains relationships between accounting records and files, ensuring data integrity, scalability, and synchronization. *(Anggraeni, 2016)*
4. **Automated Reporting Component:**
   - Enables the system to generate reports automatically for various purposes in different formats.
   - Works in close connection with the database, which acts as a data repository for all necessary reporting information. *(Intuit, 2018)*
5. **Technology Enhancement Component:**
   - Encompasses various technological tools, including computers, peripheral devices, network infrastructure, scanners, printers, email applications, and software solutions. *(Gupta & Jain, 2017)*

Essential Elements for a Successful CAIS Implementation

Beyond its primary and secondary components, CAIS requires six fundamental elements to function effectively:

1. **Personnel** (Users and IT specialists)
2. **Data** (Financial and operational information)
3. **Procedures & Instructions** (Operational guidelines)
4. **Software** (Accounting and database management systems)
5. **IT Infrastructure** (Hardware and network systems)
6. **Internal Controls** (Security and compliance measures)

By integrating these elements, CAIS can be customized to meet the unique requirements of different financial and non-financial organizations, enhancing efficiency, accuracy, and decision-making capabilities.

6- User Skills

6-1: User Skills in AI-Based Accounting Information Systems

User skills are a fundamental component in ensuring efficiency and effectiveness when interacting with modern accounting systems. As technical knowledge and data analysis abilities increase, users can better leverage AI-driven systems, leading to more accurate financial outputs. With advancing technology, it has become crucial to develop AI and data analysis skills to ensure financial sustainability and the accuracy of accounting information.

Researchers (**Hasan: 2022; Tawfiq: 2021; Wren & Jain: 2018**) have identified three key skill categories that enable users to effectively engage with modern accounting information systems:

1. Technical Skills

- Proficiency in Accounting Software: Mastering platforms like SAP, QuickBooks, and Oracle ERP, as well as utilizing AI-powered accounting tools.
- Understanding AI Principles: Familiarity with machine learning, big data processing, and financial forecasting techniques.
- Database Management: Ability to use SQL, Power BI, and advanced Excel for data extraction and analysis.
- Cybersecurity and Data Protection: Understanding information security basics to mitigate cyber risks and protect accounting data.

2. Analytical Skills

- Financial Data Analysis: Ability to interpret AI-generated financial insights to make accurate accounting decisions.
- Financial Forecasting & Risk Management: Leveraging AI tools for performance prediction and risk assessment.
- Working with Smart Reports: Understanding how to generate and interpret interactive financial reports from intelligent systems.

3. Managerial & Communication Skills

- Digital Transformation Management: Adapting to new technologies and engaging in continuous learning.
- Collaboration with Technical Teams: Effective communication with software developers and engineers to optimize system performance.
- Data-Driven Decision-Making: Utilizing AI-generated insights to support strategic decision-making within the organization.

By enhancing these skills, accounting professionals can fully leverage AI-powered accounting systems, improving accuracy, efficiency, and financial decision-making capabilities.

6- The Role of Artificial Intelligence in Enhancing Accounting Information Systems

AI contributes to streamlined data transitions in accounting by helping make financial information accurate, and quick, and efficient. The next parts summarize AI contributions, according to the researchers considered in this study: Ghasemi et al. (2020) and Nagano and Moraes (2013):

1. Enhancing Accounting Data AccuracyMachine learning algorithms support the quality of data through the reduction of errors made by humans in data entry, automaticity in the detection and correction of mistakes, and full guarantee of integrity in financial records.
2. Data Analysis & Decision MakingWith AI, large volumes of financial data are processed quickly and accurately, providing intelligence or insight with which decisions can be made strategically and on an informed basis through clear-cut forecasts and development trends in financial status.
3. Automation & Increased Efficiency in WorkAI automates repetitive accounting tasks like financial reporting, account reconciliation, and invoice management, reducing manual effort and increasing operational efficiency.

4. Enhanced Auditing & Detection of FraudsUsing AI by evaluating patterns of previously made transactions, it detects discrepancies and therefore potential activity of fraud by sending out red flags. AI also automates audit processes to ensure compliance with accounting standards and regulations.
5. Intelligent Interaction & Devoted Customer ServiceThrough AI, chatbots and virtual assistants are fast to gives replies to questions posed by accountants in reference to the accounts of their businesses or their own queries on behalf of businesses and accountants for questions on finances, thus increasing efficiency and accessibility.
6. Financial Forecasting & Risk ManagementAI predicts future accomplishment through the advancement of managerial actions based on the management of risks through financial strategies according to the historical financial data.
7. Enhancing Learning & Training for AccountantsAI enhances interactive learning through personalized training programs for further improvement and skills development in accountants to manage modern accounting systems through instant feedback while performing an activity and optimizing personal learning.

AI's Broader Impact on Accounting & Education

AI has revolutionized the accounting field by:

- Enhancing efficiency through real-time data analysis.
- Detecting errors and fraud with advanced analytics.
- Improving financial forecasting accuracy.

With this transformation, AI has become an integral part of accounting information systems, reducing manual tasks and fostering a dynamic, tech-driven work environment that requires advanced technical skills from users.

Beyond accounting, AI has also reshaped education, particularly in curriculum development. Given the rapid technological advancements, traditional knowledge quickly becomes outdated. AI enables automatic and continuous curriculum updates, ensuring that educational content aligns with industry requirements without the limitations of printed textbooks.

AI & Vocational Education

In vocational schools, it is essential to equip students with advanced skills to operate smart accounting systems. AI allows for:

- Customized training programs based on students' abilities.
- Performance analysis to help educators identify areas needing improvement.
- Personalized recommendations to bridge knowledge gaps before they hinder student progress.

By integrating AI into vocational training, educational institutions can enhance learning outcomes and prepare students to thrive in modern, AI-driven workplaces.

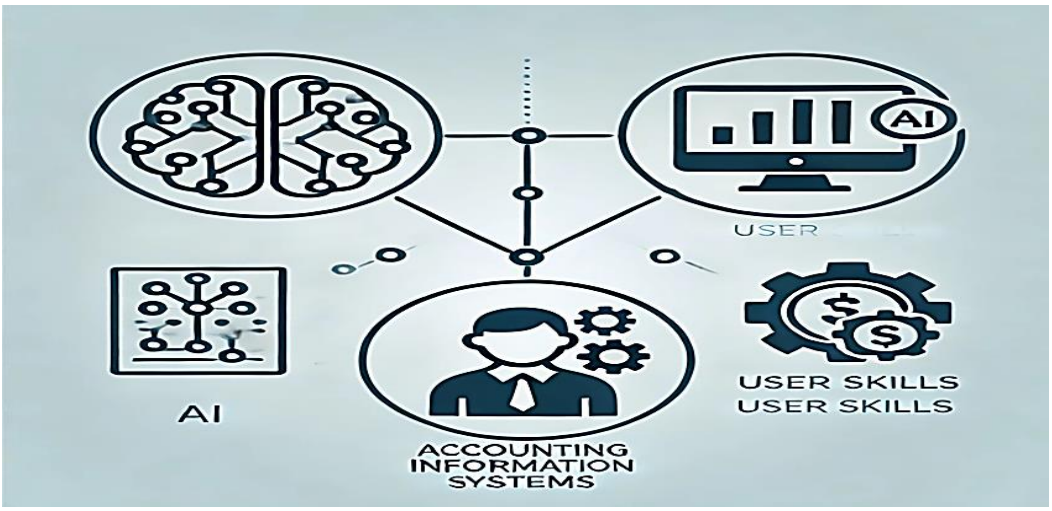


Figure (1): The Relationship Between Study Variables

Source: Figure (1) prepared by the researchers

The figure above illustrates the impact of Artificial Intelligence (AI) on Accounting Information Systems (AIS), demonstrating its role in enhancing the efficiency and accuracy of accounting operations. Additionally, the development of AIS contributes to improving user skills by providing intelligent tools that support decision-making and reduce dependence on manual processes, thereby fostering a more efficient and dynamic work environment.

Based on the above, the researchers believe that employing AI technologies in AIS is no longer an option but rather a necessity to keep pace with digital advancements and enhance financial operations' efficiency. By leveraging AI-powered tools, it is possible to improve financial data quality, minimize errors, and enhance forecasting accuracy, ultimately leading to corporate sustainability and more effective accounting decisions.

Furthermore, integrating AI technologies into the educational process, particularly in vocational schools, represents a fundamental step in preparing a new generation of accountants and professionals capable of adapting to the requirements of the digital job market. This contributes to enhancing operational efficiency and boosting competitiveness in the accounting sector.

7 Application Aspect

As we move to the practical part of this research, the focus will shift towards evaluating students' awareness of the importance of integrating artificial intelligence into educational curricula. This includes a checklist designed to assess their understanding. Additionally, we will transition into the statistical analysis, which will provide insights into the data collected from the "For Accounting Science Specialists in Vocational Schools".

7-1 the Checklist

A student checklist is used as a tool to assess their understanding of artificial intelligence (AI) concepts and applications across various fields. Through this checklist, educators can evaluate students' comprehension of fundamental AI principles, such as machine learning and data analysis, as well as their ability to apply AI tools in problem-solving and decision-making. Additionally, the checklist helps identify students' strengths and areas for improvement, enabling the

development of educational strategies that enhance their digital skills and keep pace with modern technological advancements, **As shown in the table below.**

Table No. (1): Demographic Information of the Checklist

Category	Percentage
A. Gender	
Female	63%
Male	37%
B. Academic Level	
First-Year Commercial	29%
Second-Year Commercial	29%
Third-Year Commercial	42%
C. Province	
Baghdad	20%
Maysan	19%
Babil	8%
Diyala	15%
Mosul	10%
Hamdaniya	18%
Basra	10%
Total	407 (100%)

Source: SPSS Outputs Prepared by the Researchers

Through the percentages provided in Table No. (1), it is clear to us that the highest number of responses came from female students, accounting for 63% of the total. The majority of respondents were in their third year of commercial studies, representing 42% of the sample. Geographically, Baghdad had the highest response rate at 20%, while Babil had the lowest at 8%. However, the data also show variations in students' knowledge levels. While 77% reported knowing what cybersecurity is, only 70% felt aware of the online risks they face, highlighting the need for enhanced cybersecurity education. Furthermore, 86% of students agreed that cybersecurity skills should be integrated into school curricula, reflecting a growing understanding of the evolving job market's requirements.

7-2 Analysis and Discussion of the Checklist for Accounting Science Students in Vocational Schools – Commercial Branch

Table No. (2): Analysis Results

Question	Number of "Yes" Responses	Percentage	Number of "No" Responses	Percentage
1. Do you know what artificial intelligence (AI) is?	347	85%	60	15%
2. Do you believe that AI can improve work efficiency?	376	92%	31	8%
3. Do you think AI is important for your professional future?	344	85%	63	15%
4. Do you believe AI can open new fields in the job market?	368	90%	39	10%
5. Does AI impact decision-making in organizations?	258	63%	149	37%
6. Do you know what cybersecurity is?	314	77%	93	23%
7. Do you think cybersecurity is important for protecting personal data?	407	100%	0	0%

8. Do you feel aware of the risks you face online?	**287**	**70%**	**120**	**30%**
9. Do you think there is a need to learn cybersecurity skills in school?	**253**	**86%**	**54**	**14%**
10. Do you think AI and cybersecurity can be integrated into curricula?	**312**	**76%**	**95**	**24%**
11. Do you see hands-on training as essential in AI and cybersecurity fields?	**371**	**77%**	**36**	**23%**
12. Do you believe the government should promote AI and cybersecurity education?	**374**	**91%**	**33**	**9%**

Source: SPSS Outputs Prepared by the Researchers

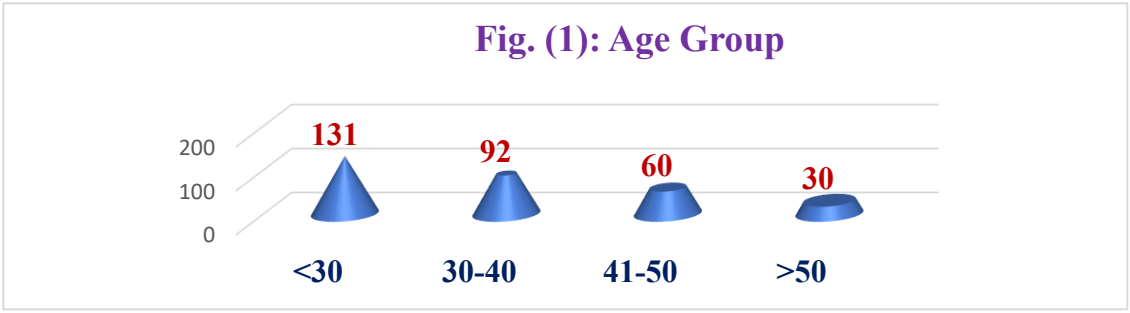
The analysis highlights that question seven received the highest percentage of "Yes" responses, with a 100% agreement rate. This underscores the vital role of cybersecurity in protecting personal data and indicates that students possess a strong awareness of the importance of digital security.

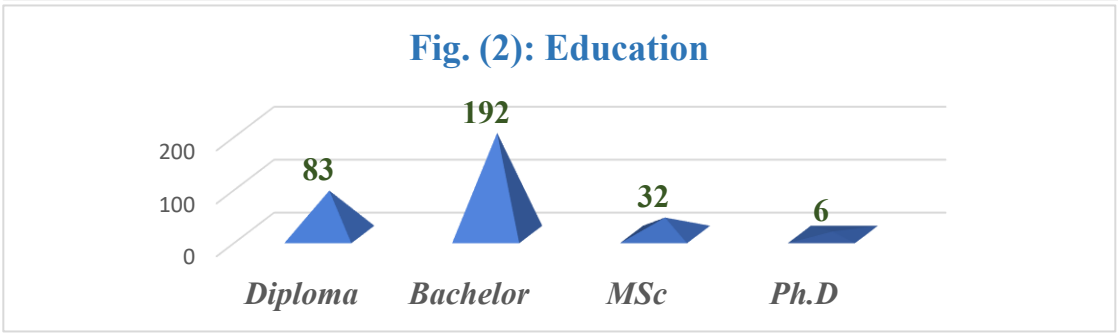
Furthermore, the responses demonstrate a positive perception of artificial intelligence (AI) and its benefits. Around **85%** of students reported familiarity with AI, while **90%** recognized its potential to create new career opportunities. These results reflect a forward-thinking mindset among students, acknowledging AI as a key driver for efficiency and innovation in the job market. Additionally, the unanimous agreement on the importance of cybersecurity suggests a growing understanding of the need for digital protection, reinforcing the necessity of integrating these concepts into educational curricula.

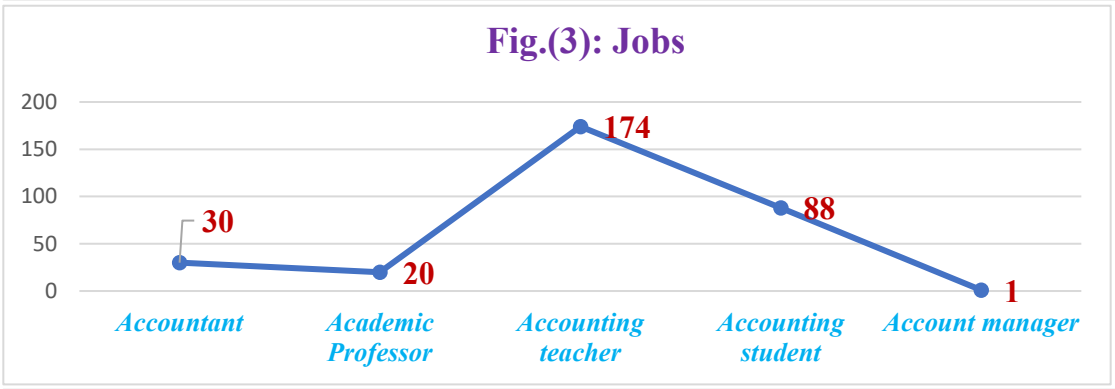
8 Inferential Analysis

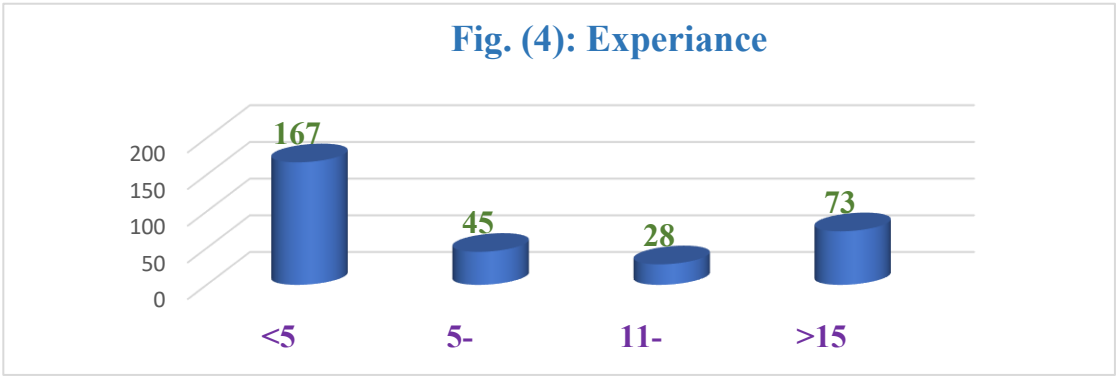
Based on students' feedback, it is crucial to assess the readiness of vocational school educators to keep pace with advancements in AI and cybersecurity, particularly in the **Accounting Sciences** specialization. The following section presents an analysis of a questionnaire designed to evaluate the awareness and skills of educational staff in vocational schools. This aims to determine their preparedness to adopt these modern technologies in the teaching process and identify the challenges they may face in this context.

The paper sample consists of (313) persons specialized in accounting matters distributed in (15) Iraqi governate, males (60.2%) and females (39.8%), with different jobs, the higher job was accounting teachers in vocational schools (55.7%), followed by accountant (9.5%), academic accounting professor, (6.5%), account manager (0.3%) in addition to accounting student (28%). The sample also contains various scientific levels, bachelor (61.3%), diploma (26.5%), master (10.1%), Ph.D (2.1%), and master (10.1%). The higher experience (< 5 years 53.3%), (> 15 years 22.9%), (5- -10 years 15.2%), (10 – 15 years 8.6%). A questionnaire was designed consisting of three main variables, the first (The role of artificial intelligence in the development of Accounting Information Systems), the second is (The impact of artificial intelligence on the skills of accounting users), and the third (Challenges and opportunities of applying artificial intelligence in Accounting Information Systems), the responses of individuals were analysed using the statistical program (SPSS) to find out the opinions of the researchers on the impact of artificial intelligence in accounting applications. We apply a five-way Likert scale consisting of options (strongly agree, agree, neutral, disagree, and strongly disagree), with the extraction of some important statistical measures. For the normality of the questionnaires, we used a **one-sample Kolmogorov – Smirnov test, figures (1-4).**









Source: SPSS Outputs Prepared by the Researchers

8-1 Stability of questionnaire and sample adequacy

We used Cronbach's Alpha coefficient to find out the stability of the questionnaire, its value for the first variable was (0.766), (0.851) for the second variable, and (0.823) for the third, all coefficients were (>70) which is the minimum acceptance value. The sufficiency of the sample using the KMO test, whose value was (0.695) for the first, (0.833), for the second, and (0.816) for the third variable, which all are greater than the standard value (0.5).

8-2 Weighted mean, standard deviation, normality test, and question level rank, for (The role of artificial intelligence in the development of Accounting Information Systems)

Table (1) shows that there was no strongly agreed, there were seven questions whose weighted means were agreed, the best answers were to the question (Artificial intelligence contributes to the acceleration of accounting data processing), with mean (4.1), followed by the question (Artificial intelligence provides new opportunities for the development of accounting work within enterprises) with mean (4.09), then the question (Current accounting information systems need to be thoroughly modernized to integrate artificial intelligence technologies) with mean (3.98), the question (Artificial intelligence reduces accounting errors caused by human intervention) with an mean (3.91), the question (The use of artificial intelligence reduces the need for traditional accounting personnel) with mean (3.86), the question (The cost of AI applications is a barrier to their use in educational and professional institutions) with mean (3.76), the question (Artificial intelligence applications provide more accurate financial analytics than traditional methods) with mean (3.43). in the main time there were three questions whose weighted means were neutral, the question (Artificial intelligence helps to improve the accuracy of accounting data) with mean (3.25), the question (Artificial intelligence helps to make more efficient accounting decisions) with mean (3.08), all the above questions were positive because its weighted mean is higher than the hypothetical mean (3), except the tenth question (Accounting programs based on artificial intelligence are sufficiently available in vocational schools) with mean (2.85) which was not positive. All questionnaires were normally distributed, their standard deviation was weak and within the range. The general mean was (3.64) which was an agreeable level.

Table (3): Statistical Measurements

Questions	Mean	S.D	Normality Test	Level Rank
1. Artificial intelligence helps to improve the accuracy of accounting data.	3.25	1.04	0.218	Neutral
2. Artificial intelligence contributes to the acceleration of accounting data processing.	4.10	0.65	0.317	Agree
3. Artificial intelligence reduces accounting errors caused by human intervention.	3.91	0.78	0.319	Agree
4. Artificial intelligence helps to make more efficient accounting decisions.	3.08	1.04	0.195	Neutral
5. Artificial intelligence applications provide more accurate financial analytics than traditional methods.	3.43	1.06	0.262	Agree
6. The use of artificial intelligence reduces the need for traditional accounting personnel.	3.86	0.87	0.296	Agree
7. The cost of AI applications is a barrier to their use in educational and professional institutions.	3.76	0.95	0.285	Agree
8. Accounting programs based on artificial intelligence are sufficiently available in vocational schools.	2.85	1.24	0.217	Neutral
9. Current accounting information systems need to be thoroughly modernized to integrate artificial intelligence technologies.	3.98	0.79	0.294	Agree
10. Artificial intelligence provides new opportunities for the development of accounting work within enterprises.	4.09	0.74	0.303	Agree
General Mean	3.64	0.91	0.271	Agree

Source: SPSS Outputs Prepared by the Researchers

8-3 Weighted mean, standard deviation, normality test, and question level rank, for(The impact of artificial intelligence on the skills of accounting users)

Table (4), shows that two questions were strongly agreed, which are (Students need additional training to use AI-based accounting tools) with mean (4.29), and (Professors need intensive training programs to understand and employ artificial intelligence in accounting) with mean (4.26), other eight question were agreed and positive (>3), the best one was (Artificial intelligence helps enhance students ' ability to use modern accounting software) with mean (4.04), the lowest was (Reliance on artificial intelligence in accounting systems can negatively affect the creative thinking of accountants) with mean (3.46). All questionnaires were normally distributed, their standard deviation was weak and within the range. The general mean was (3.93) which was an agreeable level.

Table (4): Statistical Measurements

Questions	Mean	S.D	Normality Test	Level Rank
1. Artificial intelligence contributes to improving students ' skills in financial analysis.	3.96	0.79	0.32	Agree
2. Artificial intelligence helps enhance students ' ability to use modern accounting software.	4.04	0.76	0.32	Agree
3. Artificial intelligence contributes to developing students ' critical thinking skills when solving accounting problems.	3.88	0.81	0.31	Agree
4. Students need additional training to use AI-based accounting tools.	4.29	0.72	0.25	Strongly Agree
5. It is necessary to integrate artificial intelligence applications into the accounting subject curriculum.	4.02	0.88	0.28	Agree
6. The use of artificial intelligence makes the educational process more interactive and easier.	4.01	0.82	0.28	Agree
7. Professors need intensive training programs to understand and employ artificial intelligence in accounting.	4.26	0.83	0.25	Strongly Agree
8. Artificial intelligence may limit traditional manual skills in financial reporting.	3.88	0.81	0.30	Agree
9. I feel ready to use artificial intelligence in teaching or in practical accounting applications.	3.51	1.07	0.22	Agree
10. Reliance on artificial intelligence in accounting systems can negatively affect the creative thinking of accountants.	3.46	1.05	0.23	Agree
General Mean	3.93	0.85	0.28	Agree

Source: SPSS outputs, elaborated by author

8-4 Weighted mean, standard deviation, normality test, and question level rank, for (Challenges and opportunities of applying artificial intelligence in Accounting Information Systems)

Table (5) for the answers of the third variable, only one question (The application of artificial intelligence in accounting is more an opportunity for career development than a threat to the careers of traditional accountants) was strongly agreed, with a mean (4.23), eight questions were agreed, the best one was (Artificial intelligence applications comply with current accounting laws and legislation) with mean (4.05), one question only (Some traditional accountants resist the use of artificial intelligence) was neutral with mean (3.18), all ten questions were positive (>3). All questionnaires were normally distributed, their standard deviation was weak and within the range. The general mean was (3.72) which was an agreeable level.

Table (5): Statistical Measurements

Questions	Mean	S.D	Normality Test	Level Rank
1. The process of integrating artificial intelligence into accounting information systems faces multiple challenges.	3.59	0.93	0.25	Agree
2. Some traditional accountants resist the use of artificial intelligence.	3.18	1.16	0.21	Neutral
3. The appropriate infrastructure is available in professional schools for the application of artificial intelligence in accounting.	3.60	0.84	0.26	Agree
4. Artificial intelligence applications comply with current accounting laws and legislation.	4.05	0.74	0.29	Agree
5. Accounting approaches need to be updated to keep up with developments in artificial intelligence.	3.56	0.95	0.24	Agree
6. The use of artificial intelligence can increase the risks of Accounting Information Security.	3.80	0.84	0.29	Agree
7. Educational institutions should cooperate with companies to provide practical training opportunities on artificial intelligence in accounting.	3.69	0.97	0.27	Agree
8. Vocational schools are ready to integrate artificial intelligence into their study programs.	3.88	0.78	0.31	Agree
9. The application of artificial intelligence in accounting is more an opportunity for career development than a threat to the careers of traditional accountants.	4.23	0.72	0.24	Strongly Agree
10. Accounting students need to acquire new skills to be able to deal with AI applications in the future.	3.66	0.92	0.27	Agree
General Mean	3.72	0.89	0.26	Agree

Source: SPSS outputs, elaborated by author

8-5 Multiple Response Set

Table (6) shows the multiple response set options of the three variables and their percentage, it seems that the level agreed has the highest number of responses, followed by strongly agreed, neutral, disagree, and strongly disagree respectively, the best one was the second variable.

Table (6): multiple response sets

Frequencies						
	First Responses		Second Responses		Third Responses	
Options	Number	Percent	Number	Percent	Number	Percent
Strongly Disagree	91	2.9%	43	1.4%	64	2.0%
Disagree	416	13.3%	205	6.6%	272	8.7%
Neutral	617	19.7%	499	16.0%	720	23.0%
Agree	1419	45.3%	1548	49.5%	1468	46.9%
Strongly Agree	587	18.8%	831	26.6%	606	19.4%
Total	3130	100.0%	3126	100.0%	3130	100.0%

Source: SPSS outputs, elaborated by author

8-6 Hypothesis testing and impact analysis

A multiple linear regression model was used to measure the impact of the independent variables (The role of artificial intelligence in the development of Accounting Information Systems), and (Challenges and opportunities of applying artificial intelligence in Accounting Information Systems), on the dependent variable (The impact of artificial intelligence on the skills of accounting users), to improve the alternative hypothesis;

- The first hypothesis: The presence of a statistically significant effect of artificial intelligence on the skills of accounting users.
- The second hypothesis: The presence of a statistically significant effect of artificial intelligence in Accounting Information Systems

The correlation between the dependent variable and the two independent variables was (0.778 & 0.796), and the correlation between the two independent variables was (0.775), which seems a strong correlation between the three variables, table (7). The correlation of the multiple model was (0.813), which is a strong correlation, giving a determination coefficient of (0.661); explanatory variables explain 66%, and the remaining 34% are due to external factors, table (8). The statistic (F) was significant (< 0.001) for the variables (120.517), with no problems of autocorrelation (1.651), and multilinearity (2.44 & 2.33), of the variables, table (9). The marginal slope of the model was positive, as an increase in the independent variables by one unit will improve the performance in the dependent variable by 100%. The multiple linear regression equation, table (10);

$$\hat{Y} = 9.37 + 0.411\ X_1 + 0.403\ X_2$$

Table (7): Correlation Matrix

		Y	X_1	X_2
Y	Pearson Correlation	1	0.778**	0.796**
	Sig. (2-tailed)		0.000	0.000
	N	313	313	313
X_1	Pearson Correlation	0.778**	1	0.775**
	Sig. (2-tailed)	0.000		0.000
	N	313	313	313
X_2	Pearson Correlation	0.796**	0.775**	1
	Sig. (2-tailed)	0.000	0.000	
	N	313	313	313

Source: SPSS outputs, elaborated by author

Table (8): Model Summary

Model	r	R^2	Adjusted R^2	Std. Error of the Estimate	Durbin Watson
1	0.813[a]	0.661	0.661	3.69726	1.651
a. Predictors: (Constant), X_2, X_1					
b. Dependent Variable: Y					

Source: SPSS outputs, elaborated by author

Table (9): ANOVA

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	3294.868	2	1647.434	120.517	0.000[b]
Residual	4237.611	310	13.670		
Total	7532.479	312			
a. Dependent Variable: Y					
b. Predictors: (Constant), X_2, X_1					

Source: SPSS outputs, elaborated by author

Table (10): Model Coefficients

Model	Unstandardized Coefficients	Standardized Coefficients Beta	Collinearity Statistics	
			Tolerance	VIF
(Constant)	9.370			
X_1	0.411	0.361	1	2.44
X_2	0.403	0.353	1	2.33

Source: SPSS outputs, elaborated by author

These results indicate that we can accept the alternative hypothesis, that the role of artificial intelligence applications in the development of Accounting Information Systems and enhancing the skills of users.

Conclusions

1. The statistical analysis results indicate that utilizing AI in Accounting Information Systems (AIS) positively contributes to their development by enhancing accuracy and operational efficiency. This improvement leads to better-quality accounting information, faster processing, and increased corporate sustainability in both educational and vocational institutions.
2. The study findings reveal a positive correlation between AI adoption and user skill levels in vocational schools. AI facilitates accounting operations and financial data analysis, thereby enhancing the ability of students and novice accountants to interact effectively and efficiently with modern systems.

Recommendations

1. Incorporating specialized courses on "Intelligent Accounting Information Systems" within vocational education curricula, including AI applications in accounting, to prepare highly skilled professionals capable of adapting to technological advancements in this field.
2. Developing and authoring a dedicated curriculum titled "Accounting Information Systems" for commercial and vocational schools, covering AI concepts and applications in accounting, with a focus on practical training on modern software such as SAP. This initiative aims to equip students with hands-on skills aligned with labor market demands.

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