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The Application of Digital Transformation in Accounting Education: A Case Study of Internet + Technology Improving Academic Performance

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Abstract

This study aims to evaluate the impact of the application of Internet + technology in accounting education on academic performance, with a special focus on the academic performance changes of 2022 accounting students of Ningxia Vocational and Technical College of Finance and Economics. The study adopted a quantitative analysis method to evaluate the effects of these technologies by comparing and analyzing students' scores before and after receiving Internet + technology teaching. The data was collected from the school's student status management system, covering the performance records of 124 students. SPSS software was used for data processing and analysis, and the academic performance before and after the technology application was compared through Wilcoxon signed-rank tests. The results show that the average score of students increased significantly after the application of technology, from 48.27 points to 85.40 points, indicating that Internet + technology has played a significant role in improving academic performance in accounting. This performance improvement is attributed to the flexible learning resources, enhanced interactive learning environment, and practical learning materials provided by Internet+ technology. Research also explores the potential of these technologies to improve the quality of teaching and develop students' critical thinking and problem-solving skills. Based on these findings, the study recommends that educators integrate Internet+ technology in accounting course design and calls for future research to expand the sample scope and use qualitative methods to gain an in-depth understanding of students' feelings and feedback on digital learning tools. Overall, this study highlights the importance of integrating digital technology into accounting education and provides empirical support and reference direction for other educational institutions to implement teaching reforms in similar fields. As technology continues to develop, the education field should continue to explore and adapt to new technologies to prepare students for the needs of the future accounting industry.

Keywords: Internet + technology, accounting education, digital transformation, educational technology applications, improved academic performance

1. Introduction

With the rapid development of technology, the accounting industry is undergoing unprecedented changes. In particular, technologies such as automation, cloud computing, and big data analysis are not only reshaping the nature and skill requirements of the accounting profession, but also improving the efficiency and accuracy of data processing, and bringing deeper strategic analysis and decision-making support to accounting work (Aulia, 2020). This change presents new challenges and opportunities for accounting education, especially in preparing students who are adaptable to technological advancements. Therefore, the main goal of this study is to explore the application of digital technology, especially the "Internet +" model, in accounting education and its impact on students' academic performance.

In this digital era, the core task of accounting education is not only to impart traditional accounting knowledge but more importantly, to train students to master and apply these emerging technologies. Handoyo and Anas (2019) pointed out that adapting to technological changes has become a core task of modern accounting education, which not only involves the update of course content but also includes the innovation of teaching methods and the improvement of teacher skills. Therefore, this study aims to comprehensively evaluate these

emerging technologies. Such as the current application status of cloud computing, big data analysis, and artificial intelligence in accounting education, and how these technologies have become key components of accounting education. What challenges and opportunities do they face in improving academic performance in accounting, and how can these technologies be more effectively integrated into accounting education. The core hypothesis put forward by this study is that the implementation of the "Internet +" accounting education model will be able to effectively improve students' academic performance.

To comprehensively explore these issues, this article first examines existing research through a literature review, focusing on how technology has impacted trends and developments in accounting education since the early 21st century. This includes analysis from the first introduction of computer technology into the business world to the spread of Internet technology, as well as the development of the latest accounting education methods such as online course platforms. This article will then describe the researcher's research methodology, including the data collection and analysis process. Next, the researchers conduct an in-depth analysis of the specific applications of these key technologies in accounting education and their impact on academic performance, explore the challenges in the implementation process, and discuss coping strategies. The article will conclude with a summary of the research findings and recommendations for future research directions.

Through this study, the researcher hopes to provide valuable insights and suggestions for educators, policymakers, and curriculum developers in the field of higher vocational accounting education. Help them integrate new technologies more effectively in the process of cultivating talents that meet the needs of the future accounting profession. This research not only highlights the importance of digital technologies in accounting education but also provides empirical evidence for understanding how these tec

1.1 Technological Developments and Their Impact on Accounting Education

Since the second half of the 20th century, the rapid development of computer and Internet technology has had a profound impact on the field of accounting education. From the time that computer technology was first introduced into the business world, it subsequently began to permeate accounting education. Initially, this consisted mainly of teaching basic accounting skills, such as using spreadsheet software to prepare financial statements. Zhang (2020) pointed out that during this period, the focus of accounting education was to cultivate students' ability to use computer tools for data entry, processing, and reporting. Entering the 21st century, with the popularization of information technology, especially Internet technology, the face of accounting education has begun to change significantly. Yang and Liu (2017) described that the popularity of online course platforms has made learning methods more flexible, which not only improves the accessibility and interactivity of education but also promotes innovation in teaching methods. Real-time lectures, online discussions, and collaborative projects conducted through the Internet have injected new vitality into accounting education (Berikol & Kıllı, 2020).

1.2 Integration of Course Content and Emerging Technologies

With the further development of information technology, the course content of accounting education has also undergone significant changes. Since the early 2000s, syllabuses have gradually begun to include more courses on data analytics and e-commerce, reflecting the growing industry demand for these skills. Yao et al. (2021) emphasized that the addition of data analysis, especially the application in the fields of business intelligence and data visualization, not only enables students to understand financial data but also enables in-depth analysis and interpretation. In accounting education in the 21st century, emerging technologies such as cloud computing, artificial intelligence (AI), and big data analysis have become core components. Li and Miao (2021) showed that these technologies not only promote the convenience of distance learning but also enable students to access and process large amounts of financial data in real-time. For example, some accounting courses at higher education institutions use cloud-based accounting software to enable students to collaborate remotely at night to process real financial data. In addition, according to Holmes and Douglass (2021), AI technology is increasingly used in accounting education, such as automated transaction processing, financial report generation, and complex functions such as predictive analysis and risk assessment.

1.3 Challenges Faced and Expectations for Future Changes

While the use of technology in accounting education brings numerous benefits, it also comes with its own set of challenges. Barsky et al. (2003) pointed out that resource constraints are a major issue, especially for educational institutions with limited budgets, and purchasing, maintaining, and updating high-end teaching tools require significant financial investment. In addition, teacher training is also an important challenge, as teachers need to constantly update their skills to adapt to the rapidly changing technological environment. Looking to the future, as technology continues to advance, the field of accounting education is expected to see more changes. New

technologies such as blockchain, augmented reality (AR), virtual reality (VR), and more advanced AI applications will continue to impact the skills needs and education models of the accounting profession. Asonitou (2020) predicts that blockchain technology may play an important role in accounting transparency and data security, while AR and VR technologies can be used to create immersive learning environments. These changes will not only affect course content but also profoundly impact students' learning experience.

Through the above review, this article aims to provide a comprehensive perspective to understand how technology affects the development of accounting education and provide a solid theoretical basis for studying the role of Internet + technology in improving academic performance in accounting.

2. Methods

2.1 Sample

In the experiment, 124 students majoring in accounting at Ningxia Vocational and Technical College of Finance and Economics in 2022 were selected through cluster sampling. This sample was considered sufficiently representative of the overall student population in the major. All students from the first, second, and third accounting classes of 2022 were selected. All received instruction for eight weeks, totaling 32 class hours.

2.2 Research Instruments

2.2.1 Teaching Process Design

As part of the study, the researcher implemented the following innovative teaching methods in an accounting management course:

Researchers have subverted the traditional teaching model through information technology and used advanced educational information ecological models to better meet students' personalized learning needs. For example, researchers have introduced innovative content such as cloud accounting and smart accounting, and increased the challenge and interest of the course through practical activities such as campus accounting competitions and sand table simulation business competitions, thereby increasing students' learning interest and participation.

In designing the course content, the researchers adopted a method that combines theory and practice. Researchers attach great importance to being forward-looking and contemporary and integrate the latest academic research on accounting management, changes in policies and regulations, and emerging technological achievements such as artificial intelligence and big data into the curriculum. The researchers also adopted a modular teaching method and designed personalized learning plans that meet the needs of different students based on learning patterns and accounting qualification examination requirements. In addition, the researchers emphasize the practicality of course content and enable students to apply the knowledge they have learned in actual environments by establishing an online case library and ERP sandbox simulation training.

In order to improve teaching quality more effectively, researchers pay special attention to the construction of teaching staff. The researchers established a teaching team composed of experienced accounting management teachers to regularly carry out collective lesson preparation and teaching research, and promote experience sharing among teachers through "teaching and mentoring" methods. In addition, researchers also focus on the training of young teachers and have implemented a series of teacher training and professional development plans, with special emphasis on teachers' teaching abilities in the context of "Internet +".

In terms of teaching methods, the researchers adopted online and offline hybrid teaching. This model includes not only online video lectures, online courses, and online interactions, but also offline face-to-face courses, case studies, and group discussions. In this way, researchers not only improve the accessibility and flexibility of teaching but also enhance the interaction between teachers and students and the cooperation between students.

In summary, through these innovative measures, researchers aim to improve the teaching quality of accounting courses. It not only helps students master accounting theoretical knowledge but more importantly, is able to apply this knowledge to solve practical problems. Researchers believe that these measures will help cultivate students' "learning ability" and career development potential, thereby continuously improving the teaching effectiveness of accounting courses and students' academic performance.

Table 1. Comparison of curriculum design between new accounting courses based on Internet + technology and traditional accounting courses

New courses on Internet + technology	Traditional accounting courses
1. Combination of information technology and traditional accounting For example: cloud accounting, intelligent accounting, etc., campus accounting competition, sand table simulation business competition, etc.	1. Traditional accounting teaching model
2. Combination of theory and practice For example: online case library, ERP sandbox simulation training, etc.	2. Traditional theoretical teaching
3. Online and offline blended teaching For example: online video lectures, online courses, online interactions, etc.	3. Traditional offline teaching
4. More diverse evaluations For example: student evaluation of teaching, student interview	4. Single student performance

2.2.2 Pre-test of Accounting Academic Knowledge Test

To assess students' mastery of accounting knowledge, the researchers arranged for 124 students to take a test in the first week of school. In this assessment, the researcher used a closed-book paper examination. This exam uses a test paper covering accounting content, with a total score of 100 points and an exam time of 60 minutes. Before distributing the test papers, the researcher randomly assigned the test papers to 22 students who had completed accounting courses in the previous school year. The researcher assessed the difficulty and differentiation of the test papers based on the data collected in the pre-survey. The calculated P value range is 0.20-0.80, and the Cronbach's Alpha value is 0.97. The results show that the test paper is moderately difficult, has a good differentiation effect, and is suitable for assessing students' mastery of theoretical knowledge.

2.2.3 Post-test of Accounting Academic Knowledge Test

To evaluate students' mastery of accounting knowledge after learning, the researchers arranged for 124 students to take a test at the end of the semester. In this assessment, the researcher used the same closed-book paper examination and test paper. To ensure accuracy, the order of the questions was disrupted. This exam uses a test paper covering accounting content, with a total score of 100 points and an exam time of 60 minutes.

2.2.4 Data source

The main method of data collection is to obtain student performance records from the school's student status management system. The data collected include students' academic performance before and after receiving Internet + technology teaching to facilitate before-and-after comparative analysis.

2.2.5 Data Analysis

In order to analyze the collected data, the researcher chose SPSS software. First, the collected scores were analyzed using a normality test to provide an overview of the sample data. The analysis involves examining the mean and standard deviation of the scores. If the average knowledge score is below 70%, the requirement is not met. Next, the paired-sample Wilcoxon signed-rank test was used to compare students' scores before and after technology application to evaluate the impact of Internet + technology on academic performance.

3. Results

This study aims to achieve the goal of improving students' academic performance through Internet + technology courses. Regarding student knowledge, a research hypothesis can be put forward: after students receive course guidance on Internet + technology, their knowledge level exceeds the predetermined standard (70% of the total score, equivalent to 70 points).

Before testing these research hypotheses, the researchers used SPSS 23.0 to test the normal distribution of students' knowledge test results. The Kolmogorov-Smirnov test was used to compare the cumulative frequency distribution of the sample data with the normal distribution. If the difference between the two is small, it indicates that the sample was drawn from a population that follows a normal distribution pattern. In the researcher's calculation, the researcher found that the p-value of the research data was 0.002, not exceeding 0.05, confirming that this set of data did not meet the conditions of normal distribution (See Table 2). Paired samples Wilcoxon signed-rank test was used to compare student performance before and after the course. The average score of Pre-Test Scores is M148.27, and the average score of post-test scores is M2=85.40. The pre-test did not exceed the predetermined score of 70 points, and the post-test exceeded the predetermined score of 70 points. On the surface, the course effectively improved the students' knowledge level(See Table 3).

The Wilcoxon signed-rank test showed that the performance improvement was statistically significant ($Z = -9.664$, $p < 0.05$) (See Table 4). This shows that the course has a significant positive impact on improving students' accounting knowledge. The significant performance improvement may be attributed to the various advantages of Internet + technology in accounting education, including more flexible access to learning resources, a more efficient interactive learning environment, and learning materials that are closer to practical applications. In particular, the use of digital tools such as online simulation software, data analysis tools, etc. may have enhanced students' understanding and application of accounting concepts.

Furthermore, these results also provide insights into the reform of teaching methods and course content. They show that integrating Internet+ technology into accounting education not only helps improve students' academic performance but may also promote their critical thinking and problem-solving abilities. This change in learning provides new perspectives on traditional education models and highlights the importance of continuing to explore and implement the use of these technologies in education.

Table 2. Kolmogorov-Smirnov test on pre-and post-test scores of 124 students

Test	Statistic	df	p-value
Kolmogorov-Smirnov	0.104	124	0.002

Table 3. Pre-test and post-test mathematical statistics results of 124 students

Measurement Time	Mean(SD)	Minimum	Maximum	Median	N
Pre-Test Scores	48.27＜70 (9.941)	30	69	48.00	124
Post-test Score	85.40＞70 (9.372)	70	99	86.50	124

Table 4. Wilcoxon signed-rank test results on 124 students' pre-and post-test scores

Test Statistics	Z-Value	p-Value
Post - Pre-Test Scores	-9.664	<0.05

4. Discussion

The data analysis results of this study clearly show that the application of Internet + technology has significantly improved the academic performance of the 2022 accounting students of Ningxia Vocational and Technical College of Finance and Economics. This finding not only highlights the important role of digital technology in accounting education but also reveals its huge potential in improving students' academic performance. The significant improvement in performance can be attributed to a number of factors. First, Internet + technology enables students to access and utilize information more effectively by providing richer and more flexible learning resources. The application of this technology increases the accessibility of learning materials, allowing students to study at their own pace and interests. Secondly, the integration of the Internet + technology has improved the interactivity and practicality of teaching methods. The introduction of modern technologies such as online simulation software and data analysis tools enables students to gain a deeper understanding of accounting concepts and apply them to real-world situations. This practice-oriented learning method helps students better understand theory and transform theoretical knowledge into practical application capabilities.

Additionally, these technologies promote the development of critical thinking and problem-solving skills in students. Through interactive learning and real-time feedback, students are encouraged to think deeply about accounting concepts, challenge existing understandings, and be creative in solving complex problems. This way of learning not only improves their academic performance but also lays a solid foundation for their careers.

However, although this study demonstrates the positive results of the application of Internet + technology in accounting education, we must also recognize the limitations of the study and future challenges. First, technology applications have varying degrees of penetration in education, which may lead to unequal access to resources and thus affect student learning outcomes. Additionally, teachers may face skills and adaptability challenges in adopting new technologies, which require ongoing professional development and support. Second, for some students, overreliance on technology may undermine the development of traditional learning skills, such as critical thinking and interpersonal skills. Therefore, future research should explore how to balance technology applications with traditional teaching methods to promote a comprehensive learning experience.

In addition, as technology continues to advance, accounting professional education needs to constantly update its course content and teaching methods to adapt to changes in the industry. Future work should explore how to

effectively integrate emerging technologies, such as artificial intelligence and blockchain, to further improve the quality of education and students' practical abilities. Therefore, this research result further confirms the importance of integrating Internet + technology into accounting education. In order to adapt to the pace of technological development, the current education model needs to integrate new technologies to improve teaching quality and learning effects. For example, by using cloud-based accounting software and AI-driven analytical tools, students can apply their knowledge in real-world business settings. This not only helps them better prepare for their future careers but also cultivates professional talents for the accounting industry that can adapt to the needs of digital transformation. Future research should continue to explore the use of technology in education to address these challenges and fully exploit its potential.

5. Conclusion

This study successfully evaluates the role of Internet + technology in improving the academic performance of accounting by conducting an in-depth analysis of the academic performance of 2022 accounting students of Ningxia Vocational and Technical College of Finance and Economics. The results clearly show that the application of these technologies significantly improves students' academic performance, thus underscoring the importance of digital technologies in accounting education. This finding not only provides empirical support for current educational practices but also provides valuable reference and inspiration for other educational institutions to implement teaching reforms in similar fields.

Based on these findings, the recommendation for educators is to actively consider integrating Internet+ technologies into the curriculum when designing and implementing accounting courses. This means not only updating teaching content to include more knowledge and applications of digital technologies but also adopting innovative teaching methods. For example, online and offline hybrid teaching can provide a more diversified learning experience. Real-time interactive learning can enhance students' sense of participation and motivation, while case-based learning methods can help students combine theoretical knowledge with practical problems to better understand and apply the knowledge they have learned.

Future research should aim to expand the sample to include more colleges and regions to enhance the generalizability and applicability of the findings. In addition, it is recommended that future research adopt qualitative methods to gain an in-depth understanding of students’ feelings and feedback about digital learning tools. Through this approach, researchers can better understand how these tools impact student motivation, engagement, and long-term academic performance, thereby providing deeper insights and improvements to educational practice.

Overall, this study highlights the importance of integrating digital technologies in accounting education. As technology continues to advance, the education field should continue to explore and adapt to these changes in order to prepare students who can meet the needs of the accounting profession in the future. In this way, education can not only impart knowledge but also develop skills and abilities in students, preparing them for their future careers.

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Authors contributions

The author Ningxin Ma was responsible for the study design revision and data collection. Assoc. Prof. Dr. Prasert Ruannakarn was responsible for revision and polishing. Final draft read and approved by all authors.

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