

Research on the Application and Development of RPA in Accounting Higher Vocational Education: A Chinese Perspective

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Abstract: Amid the swift rise of artificial intelligence and Robotic Process Automation (RPA), there is an urgent call for innovative shifts in accounting education within higher vocational institutions. This study examines the pragmatic use of RPA, against the backdrop of China's professional accounting education landscape. The current focus on accounting calculations and financial software in Chinese accounting education overlooks vital skills in financial robot operation and data handling. Furthermore, students' organizational and communicative abilities demand enhancement. To address these issues, vocational colleges should prioritize educator development and curricular adaptations. These measures will nurture a cohort of students equipped with enhanced comprehensive skills, poised to adapt to the dynamic demands of the financial sphere and contribute to its sustainable evolution.

Keywords: Robotic Process Automation (RPA), Accounting education, Higher vocational institutions.

1. Introduction

The rise of robotic process automation (RPA) and its fusion with artificial intelligence is reshaping accounting practice and education worldwide. As the financial industry embraces automation and data-driven insights, the accountant's role is evolving with a focus on digital tools, data analytics, and smart financial management [1].

Amid China's rapid technological advancement and commitment to AI leadership, the role of RPA is critical. Organizations ranging from industry giants to local companies are leveraging RPA to improve efficiency and decision-making [2]. Against this backdrop, therefore, accounting professionals now need not only traditional financial acumen but also the ability to apply digital tools to drive automation, data analytics, and smart financial management. This shift raises a key question: How can China's vocational accounting education system effectively develop the skills students need to adapt to a technology-driven financial landscape?

This inquiry forms the core of this study, which aims to explore the uncharted territory of integrating RPA into Chinese higher vocational accounting education. By drawing insights from academic literature and qualitative analysis, it aims to illuminate the dynamic relationship between the acquisition of RPA skills and its practical impact on the accounting profession.

2. Method

First of all, to establish a comprehensive foundation, this paper adopts the literature research method and conducts extensive literature reviews through academic databases such as Google Scholar and CNKI. A variety of research materials including articles, reports, and academic papers were collected, and the relevant research results were sorted out to fully grasp the application of RPA in accounting higher vocational education around the world. Finally, the results of

the qualitative analysis are integrated with the theoretical basis of vocational education, technological progress, and industry needs. This integration lays the foundation for practical recommendations to strengthen the integration of RPA in higher vocational accounting education in China.

Next, the collected relevant literature is summarized and analyzed from the four dimensions of research hotspots, development, influence, and inspiration.

3. Findings and Discussion

3.1. Focus: Key Aspects of RPA in Accounting Educations

A comprehensive literature review on Google Scholar and CNKI underscores the significant volume of literature concerning RPA, particularly within the realm of accounting. This underscores the inherent synergy between RPA technology and the accounting domain [3]. Nonetheless, while RPA technology has garnered global attention in the financial sphere, its intersection with educational research remains relatively underexplored.

Within the extensive literature survey, it becomes evident that the integration of RPA technology into accounting education, particularly in the context of higher vocational institutions, is relatively limited, especially within China [4]. Despite the substantial attention RPA technology commands in accounting, its profound integration into higher vocational accounting education remains in its nascent stages. This underscores the significance of unearthing the latent potential of RPA's applications in the educational arena [5]. With the ever-evolving financial landscape and the swift strides of technology, the integration of RPA into accounting higher vocational education emerges as a subject of paramount interest, meriting further research and discourse. This, in essence, unearths a novel and intricate domain: how to seamlessly introduce RPA technology into higher vocational accounting education to foster professionals adeptly responsive to the demands of the digital era.

3.2. Development of RPA in Vocational Accounting Education

Robotic Process Automation (RPA), has undergone significant evolution across distinct stages. Initially, preceding the 2010s, RPA established its foundation by targeting the streamlining of repetitive tasks [6]. During this phase, emphasis centered on simplifying rule-based processes, though lacking today's advanced intelligence [7].

With the onset of the 2010s, RPA entered an enhancement phase. Technological progress was seamlessly integrated machine learning and natural language processing, empowering RPA to navigate intricate tasks and unstructured data [8]. This marked the inception of RPA's journey toward heightened automation. In the mid-2010s, a pivotal transition occurred as RPA converged with artificial intelligence, giving rise to intelligent RPA [9]. This fusion endowed RPA not solely with task execution capabilities but also the prowess to analyze data and make informed decisions, adeptly adapting to evolving business dynamics. Advancing into the late 2010s and beyond, RPA continued its rapid progression. Industries universally embraced RPA to streamline processes, curtail costs, and gain competitive advantages [10]. Meanwhile, solution providers consistently honed their offerings in alignment with the ever-evolving market requisites [11].

3.3. Research on the impact of RPA on accounting majors

In March 2021, the Chinese Ministry of Education issued a notice, marking a major change in the pattern of higher education. The change involved renaming the accounting major as the "Big Data and Accounting" major [12]. This strategic shift is in line with the modern needs of the financial industry and is a response to the changing role of technology, in particular, the rise of robotic process automation (RPA) and the pervasive impact of big data and artificial intelligence.

This shift reflects a growing awareness of the potential of RPA and technology-driven solutions to reshape accounting practices. Characterized by its ability to automate repetitive tasks with speed and accuracy, RPA has brought about a paradigm shift in the field of accounting [13]. These technological advancements have prompted a more streamlined and efficient approach in the financial sector, rendering traditional manual accounting methods obsolete. This development has also ushered in an era in which financial professionals must not only be proficient in traditional accounting principles but also be adept at utilizing cutting-edge technological tools. The accountant's traditional role centered on manual data entry and calculations has been transformed. In this new landscape, accountants are becoming data analysts and decision-makers, leveraging the insights from big data analytics and the power of RPA to drive strategic financial decisions [14].

The convergence of RPA, big data analytics, and artificial intelligence unlocks unprecedented potential. Well-known Chinese companies such as China Railway Fourth Bureau, TCL, China Southern Airlines, and Wanda are typical examples of leveraging this synergy to optimize financial operations [15]. The implementation of financial robotics has improved the accuracy of various financial processes, reduced operating costs, and increased efficiency. With the advancement of the times, financial professionals must be exposed to accounting tools. While the specifics of how the tools are used may change, the essence of applying

accounting knowledge remains the same. The application of financial robotics technology in China's financial sector aims to liberate financial professionals from mundane and repetitive accounting work, allowing them to focus on higher-value business aspects [16]. Gartner predicts that by 2025, a considerable part of basic financial accounting tasks will be undertaken by intelligent financial robots, which prompts financial professionals to enhance their core capabilities in irreplaceable accounting roles [17].

However, despite the promise, this technological evolution also raises questions about the future role of human accountants. The increasing integration of RPA and artificial intelligence into accounting processes has raised concerns about job losses. While some mundane tasks are being automated, this shift is simultaneously providing accountants with new opportunities to advance their roles, focusing on strategic decision-making and value-added analysis.

Given these changes, vocational colleges need to develop their programs to produce professionals with the skills required by the modern financial industry. The Big Data and Accounting major requires a balance of core accounting knowledge and proficiency in the use of RPA and data analytics tools. Graduates should be versatile professionals able to interpret complex data patterns, generate valuable insights, and contribute to the strategic direction of the organizations they serve.

Overall, the transformation of accounting education reflects the industry's adaptation to technology-driven advancements, embodied in the integration of RPA and big data analytics. This shift underscores the need for a vibrant education system that produces professionals who can harness the full potential of technology while maintaining a deep understanding of financial principles. For the next generation of accountants to thrive in this digital age, there will be a need for continuous adaptation, collaboration, and proactive embrace of the evolving financial technology landscape in accounting between academia and industry.

3.4. Research experience—Evaluation of the new model of training applied accounting talents in vocational colleges

3.4.1. A single talent development model

Amid the evolving educational landscape, Chinese vocational colleges shoulder the crucial responsibility of preparing accounting students for the dynamic demands of their professional journey. However, the prevailing approach to curriculum design seems to adhere to a monotonous trajectory. This is notably highlighted by the Ministry of Education's directive in March 2021 signaling the imperative for a more expansive skill set in modern accounting practitioners [18]. The current curriculum, while proficient in conveying essential accounting principles and theoretical groundwork, exhibits a conspicuous gap in addressing data manipulation and utilization proficiencies. This deficiency poses a challenge to graduates' adaptability and competitiveness within an industry that increasingly esteems multidisciplinary expertise.

Vocational colleges, revered for their pragmatic and application-focused pedagogy, stand poised to recalibrate their strategies. They must not solely prioritize a comprehensive grasp of core accounting concepts but also underscore the adept application of contemporary tools like financial robots and big data analysis [19]. In essence, the

shift entails fostering a curriculum that empowers students with both theoretical knowledge and hands-on skills. This transformation will enable graduates to not only navigate the complexities of modern accounting but also engage with technological advancements that are shaping the future of the financial landscape.

To elaborate further, the prevailing approach of vocational colleges has largely focused on subjects like accounting principles, financial software application, and economic law. However, this curriculum tends to overemphasize the core technical competencies required in accounting, often disregarding the imperative need to cultivate students' data application and manipulation skills. The consequence is a misalignment between the curriculum and the evolving industry needs, hampering graduates' ability to secure optimal employment outcomes. Vocational colleges, under their pragmatic orientation, should pivot their strategies to place a profound emphasis on nurturing students' practical operational skills. The objective should encompass the development of both robust theoretical knowledge and hands-on capabilities.

While many institutions tend to benchmark their curriculum against the standards of entry-level accounting certifications, this approach, though advantageous, may inadvertently limit students' readiness for the multifaceted demands of the contemporary industry. This singular emphasis, often centered on certification attainment, underestimates the industry's shifting demands for professionals with a broader, forward-thinking perspective. Vocational colleges should broaden their horizons, fostering graduates who are not only proficient in routine accounting tasks but are also equipped with an advanced financial perspective that can drive innovative solutions for businesses.

In the classroom setting, it is evident that traditional teaching approaches have sometimes overlooked the cultivation of students' practical skill sets. Focusing predominantly on textbook instruction, teachers' delivery often lacks the interactive and student-centered approach necessary to engage learners effectively. This conventional approach often leaves students bewildered and disconnected from the subject matter. Moreover, in the absence of practical exposure through internships, students often struggle to bridge the gap between theoretical concepts and real-world applications. In this context, the incorporation of RPA financial robots holds immense potential. By automating and visualizing the learning process in the classroom, students are better poised to comprehend complex concepts, fostering enhanced engagement and learning efficiency [20]. This holistic pedagogical approach, combined with the integration of practical tools, aligns with the evolving needs of the accounting field and equips students for success in the digital age.

3.4.2. Inadequate Faculty Capacity for Robot Process Automation Technology

The ascent of RPA and the dawn of big data signal a profound shift in today's financial landscape. Career colleges stand at a crucial juncture as these technological tides reshape entire industries. While the curriculum remains the bedrock, its evolution must encompass the latest strides. The intricate realm of RPA technology and big data underscores the pressing need for educators adept in these domains. However, the present faculty composition frequently lacks depth in areas such as data science, artificial intelligence (AI), and

machine learning [21].

This unmasked gap lays bare a multi-faceted challenge that career colleges must proactively tackle. The solution resides in deliberate investments in robust faculty development initiatives. By facilitating continuous training, skill augmentation, and fostering avenues for interdisciplinary collaboration, institutions can empower instructors to adroitly navigate the intricacies inherent in these transformative technologies [22]. Moreover, these endeavors enable educators to effectively convey to students the tangible applications of RPA and big data.

In the realm of RPA and big data, educators play a pivotal role in bridging the chasm between theory and application. Yet, the current landscape in vocational colleges reveals a disparity. The integration of these pivotal subjects into the curriculum lacks the prominence it warrants. Traditional pedagogical methods dominate accounting courses while emerging offerings encompassing RPA technology and big data remain nascent.

Career colleges face a dual challenge in this pursuit. The first hinges on faculty readiness. A significant proportion of educators in professional schools hold master's degrees in business-related disciplines. Nonetheless, many lack comprehensive exposure to data science and big data through formal coursework, and a substantial number lack a background in computer science. This circumstance engenders self-doubt among educators regarding their computer proficiency. Additionally, individuals possessing a well-rounded computer science foundation within business studies rarely gravitate towards academic positions in professional colleges. Hence, the paucity of educator expertise in these realms poses a formidable hurdle. Secondly, the existing aptitudes and learning methodologies of higher vocational students necessitate enhancement. A subgroup of students grapple with fundamental disparities due to varying skill levels. Courses amalgamating accounting theory with the domains of big data and computer science are inherently demanding. These courses build upon accounting theory while assessing students' overarching ability to meld accounting principles with the intricacies of big data and computer science. Thus, the diverse expectations from students demand a comprehensive educational approach.

The arena of RPA technology and big data education in higher vocational colleges remains incipient, and the integration of its RPA courses mandates meticulous planning and coordination. It calls for a joint effort by educators and students to surmount inherent challenges. By surmounting these obstacles, vocational colleges can effectively guide educators and students to harness the transformative potential of financial robotics and big data, thereby adeptly bridging the divide between theoretical knowledge and practical application.

3.4.3. Inadequate Faculty Capacity for Robot Process Automation Technology

In the contemporary financial landscape, the pace of progress in modern financial technology is relentless [23]. Simply being proficient in accounting and bookkeeping no longer meets many employers' basic hiring criteria. The job market survey conducted by the author confirms that the current job market for graduates of higher vocational schools, especially small and medium-sized enterprises, is looking for candidates with professional qualifications and above. The market is looking for candidates who are proficient in using modern financial software, and office applications and

possess not only technical prowess but also the requisite soft skills such as organizational acumen, effective communication, ability to work independently, and collaborative agility.

In this era of digital and technological advancement, accounting professionals must develop a perspective that goes beyond the immediate exigencies. The vitality of technological progress calls for the improvement of capabilities in many aspects. At present, higher vocational colleges pay more attention to improving the professional skills of students. Unfortunately, this focused emphasis often overshadows the importance of developing students' general business acumen. Therefore, higher education institutions must seriously consider the cultivation of students' overall abilities when formulating follow-up courses and teaching strategies.

Achieving this goal rests on the foundations of a reimagined educational paradigm. This paradigm requires courses that go beyond theoretical classrooms and instead integrate hands-on experience, collaborative projects, and industry partnerships. By constructing learning environments that reflect real-world challenges, career colleges can equip students with the multifaceted skills needed to excel [24]. Demonstration methods will cover different dimensions. Vocational colleges can facilitate industry placements and encourage students to apply theoretical knowledge to real-world scenarios. Collaborative projects in which students work as a team to solve complex problems will develop teamwork and analytical thinking. Additionally, partnerships with financial firms will infuse real-world insights into the curriculum, allowing students to directly engage with industry trends and needs.

4. Conclusion

This paper explores the utilization and advancement of RPA in accounting higher vocational education, delving into various viewpoints to unveil existing challenges and possible solutions. In essence, the integration of RPA technology into the accounting realm not only streamlines data processing and automation but also necessitates educational system reforms. Nonetheless, several aspects of the current higher vocational education model warrant enhancement.

Foremost, we underscore the singularity of the personnel training approach in higher vocational education. Presently, the curriculum primarily concentrates on core accounting knowledge, sidelining the fostering of data application and manipulation skills. This paradigm leaves students ill-equipped to tackle intricate financial data analysis and RPA applications. To align with industry requisites, higher vocational institutions should restructure their curriculum, prioritizing practical skills and the utilization of modern tools like financial robots.

Secondly, this paper highlights educators' underpreparedness in the realm of financial robotics. In the face of emerging technologies like RPA and big data, instructors' grasp of related knowledge remains inadequate. Hence, higher vocational colleges should amplify teacher training and development initiatives, encouraging interdisciplinary cooperation to better facilitate the comprehension and teaching of these cutting-edge technologies.

Lastly, the dearth of comprehensive skill cultivation among students is underscored. The modern financial sector demands accounting professionals equipped not solely with technical

prowess but also with an array of soft skills. Regrettably, the current curriculum disproportionately accentuates technical training, sidelining the refinement of students' communication, analysis, and teamwork capabilities. To address this, higher vocational institutions should re-envision their curriculum and instill comprehensive aptitude through experiential projects and industry collaborations.

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