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Factors Influencing the Adoption of RPA in Vocational College Accounting Courses

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Abstract: The integration of Robotic Process Automation (RPA) technology in the field of education necessitates a thorough exploration of the acceptance factors among accounting educators. This study addresses this gap by examining the dynamics influencing the adoption of RPA in accounting education within vocational colleges. Grounded in the Technology Acceptance Model (TAM), Structural Equation Modeling (SEM) is employed to empirically assess the influencing factors. Findings from a survey involving 395 accounting educators in Shaanxi, China, indicate that the intention to adopt RPA in accounting courses is influenced by perceived usefulness, ease of use, social influence, job relevance, result demonstrability, computer self-efficacy, and facilitating conditions. This extended model provides a nuanced understanding of the complexities involved in RPA adoption. The results offer insights for policymakers, institutions, and educators aiming to integrate RPA into their teaching practices.

Keywords: Robotic Process Automation (RPA), Vocational colleges, Accounting education, Technology Acceptance Model (TAM), Accounting transformation.

1. Introduction

With the rapid development of the digital era, vocational college accounting education is facing new challenges and opportunities. Robotic Process Automation (RPA) has garnered widespread attention as an efficiency-boosting tool. However, the acceptance of RPA in vocational college accounting education has not been thoroughly studied. Given the ongoing technological advancements, there is an urgent need to gain deeper insights into the practical application of RPA in vocational college accounting education and the factors influencing its acceptance.

This study is grounded in the Technology Acceptance Model (TAM) and aims to comprehensively investigate the influencing factors of RPA in vocational college accounting education. By exploring the application of RPA technology in accounting education, we seek a better understanding of its potential role in enhancing teaching effectiveness and fostering practical skills among students.

In summary, by examining the acceptance of Robotic Process Automation (RPA) in vocational college accounting education, we aim to provide practical insights for education decision-makers, the academic community, and vocational colleges. We seek to offer robust support for the sensible integration of RPA technology in accounting education. In the end, the results of this study are expected to have meaningful and practical implications for the progress and innovation in the field of vocational college accounting education.

2. Fundamental Theories and Conceptual Framework

(1) Theory of Reasoned Action (TRA)

The Theory of Reasoned Action (TRA) is a widely accepted model for understanding human behavior, particularly in predicting acceptance judgments [1]. It emphasizes that behavioral intention, influenced by attitudes and subjective norms, is a key predictor of behavior. Attitudes represent an individual's feelings towards a behavior, while subjective norms reflect perceived social pressures. TRA posits that intention is formed through belief evaluations of behavioral outcomes and normative beliefs of significant others [2] .

However, TRA has limitations, especially in the context of information systems, leading to the development of the Technology Acceptance Model (TAM) to explore technology acceptance, particularly in voluntary situations.

(2) Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) represents a seminal framework that builds upon the Theory of Reasoned Action (TRA) to delve into users' adoption of information technology [3]. TAM posits that users' behavioral intentions are pivotal in shaping their actual usage of a system, and it centers on two key determinants: perceived usefulness and perceived ease of use.

Perceived usefulness, a cornerstone in TAM, captures users' convictions regarding the system's capability to enhance task performance. It reflects the extent to which individuals believe that employing the technology will result in tangible benefits, productivity gains, or improved outcomes in their specific tasks or activities.

In parallel, perceived ease of use gauges users' perceptions of the system's simplicity and user-friendliness. It assesses the ease with which individuals anticipate they can interact with and navigate the technology [4]. The more straightforward and accessible users perceive the system to be, the higher the likelihood of positive attitudes and intentions toward its adoption [5].

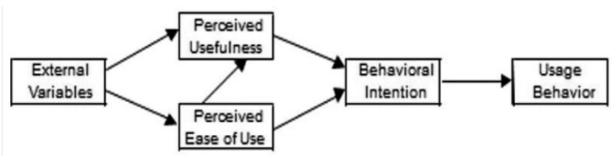

Figure 1. Technology Acceptance Model (TAM)

Illustrated in Figure 1, the TAM diagram visually represents the relationships among perceived usefulness, perceived ease of use, attitudes, behavioral intentions, and actual system usage. The model asserts that perceived usefulness and perceived ease of use are fundamental factors influencing users' attitudes. These attitudes, in turn, shape users' behavioral intentions, ultimately impacting their real-world engagement with the system. This model's simplicity and clarity have contributed to its widespread adoption and validation across diverse contexts, making it a cornerstone in technology acceptance research.

(3) TAM2

TAM2 [6] extends TAM by introducing additional factors, including subjective norm, image, job relevance, output quality, and result demonstrability. It addresses limitations in TAM related to voluntary behavior and general attitudes.

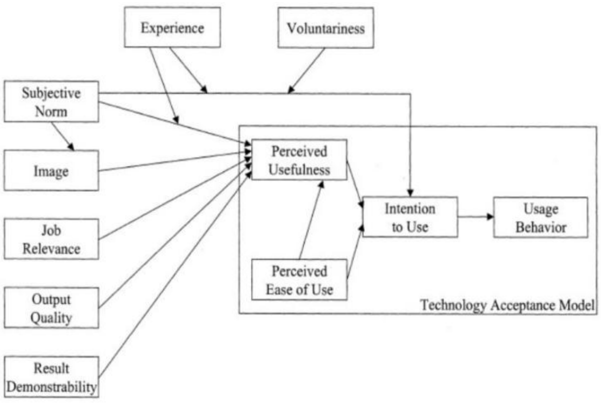

Figure 2. Technology Acceptance Model (TAM 2)

TAM2 introduces subjective norm, indicating conformity to social group opinions, and image, reflecting perceptions of social status. Job relevance, output quality, and result demonstrability contribute to perceived usefulness.

(4) TAM3

TAM3 [7] integrates drivers of perceived usefulness and perceived ease of use, introducing elements such as computer self-efficacy and computer playfulness.

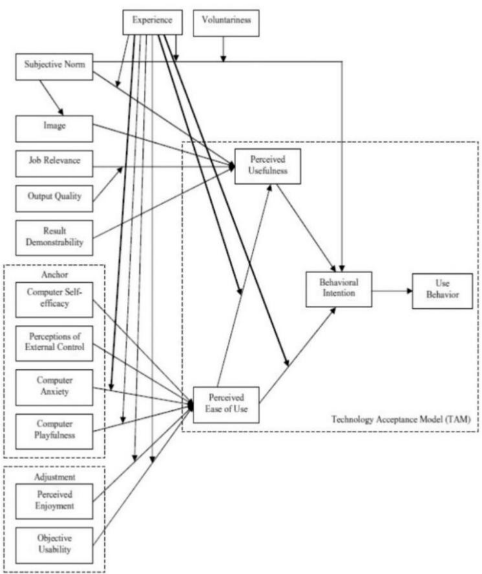

Figure 3. Technology Acceptance Model (TAM 3)

TAM3 combines anchor factors and adjustment factors, revealing the impact of usage experience on technology acceptance. It enhances our understanding of technology adoption and usage.

(5) Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT [8] integrates eight information technology behavior models, emphasizing organizational context. It considers performance expectations, effort expectations, social influence, and facilitating conditions.

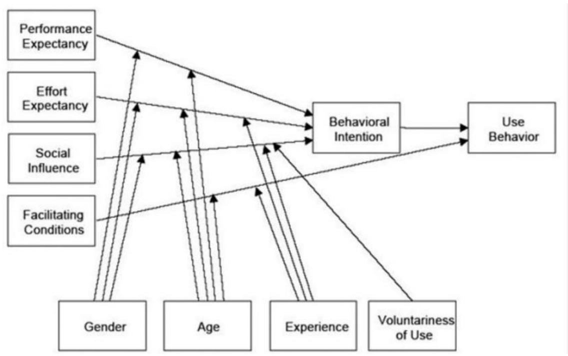

Figure 4. Unified Theory of Acceptance and Use of Technology (UTAUT)

UTAUT includes moderating variables like gender, age, experience, and voluntariness. It predicts behavioral intention and usage behavior based on various components, providing a comprehensive explanation of technology acceptance.

In conclusion, this study's theoretical foundation is rooted in the TAM and its extensions, TAM2, TAM3, and the UTAUT. The selection of TAM as the foundational framework is due to its widespread validation, simplicity, and stability, while incorporating variables from subsequent models to provide a comprehensive understanding of technology acceptance.

(6) Conceptual Framework

While TAM has been globally applied, its use in China, particularly in vocational college accounting education, is limited. This study aims to fill this research gap by examining RPA technology adoption in Chinese vocational accounting schools, enhancing TAM's explanatory power in this context.

Refining the TAM model for vocational colleges, this study incorporates additional variables while maintaining Perceived Usefulness and Perceived Ease of Use as mediating variables, and behavioral intention as the dependent variable. Independent variables include social influence, self-efficacy, job relevance, result demonstrability, and facilitating condition.

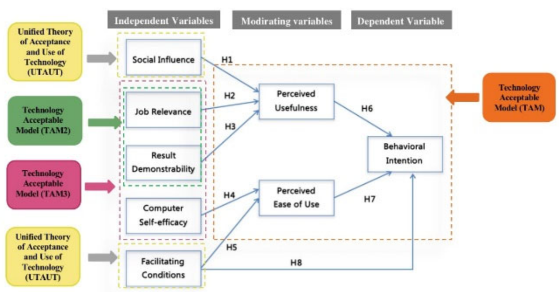

Figure 5. Acceptance Model for RPA Technology in Accounting Education at Vocational Colleges

3. Methodology

(1) Research Method

In this study, we use a quantitative research approach to measure how vocational college accounting educators accept Robotic Process Automation (RPA) technology. By collecting and analyzing numerical data, our goal is to fully understand the attitudes, perceptions, and intentions of educators toward RPA technology.

(2) Sampling Design

To make our research efficient, we opt for a convenient sampling design. Specifically, we choose accounting educators in vocational colleges in Shaanxi Province as our research sample to ensure it accurately represents the population. Convenient sampling makes it easy to reach participants, allowing us to swiftly gather their opinions and attitudes toward RPA technology.

(3) Questionnaire Development

To capture educators' perspectives comprehensively, we create a research questionnaire covering factors from the TAM, TAM3, and UTAUT models. The questionnaire explores various aspects, including educators' attitudes toward RPA technology, perceived usefulness, perceived ease of use, and more. With detailed question design, we ensure accurate and thorough data collection.

(4) Data Collection

We conduct data collection through the online survey platform, Questionnaire Star. By sharing the questionnaire link with accounting educators in vocational colleges in Shaanxi Province, we collect their feedback and insights. The combination of convenient sampling and online surveys allows us to efficiently gather a substantial amount of valid data.

(5) Data Analysis

Following data collection, we perform descriptive statistical analysis using SPSS to summarize the demographic characteristics of the sample. Cronbach's alpha is employed to assess the internal consistency and reliability of the measurement scale. Confirmatory Factor Analysis (CFA) is then used to evaluate the validity of the measurements. Subsequently, Structural Equation Modeling (SEM) is applied to test the research model. These analyses aim to provide a comprehensive understanding of the acceptance level of RPA technology among vocational college accounting educators and identify the key factors influencing their attitudes and intentions.

4. Results and Findings

(1) Demographic Information

In our effort to comprehend the participants, we thoroughly examined the collected data, unveiling essential demographic features among accounting faculty members in Shaanxi Province. The gender distribution paints a balanced picture, with 31.1% male and 68.9% female faculty members. The majority, representing 24.3%, falls within the 26-30 age range, shedding light on the prevalent age groups in this study.

Turning our attention to educational qualifications, 50.9% of faculty members hold a Master's degree, 22% have a Bachelor's degree, 14.2% possess a Doctorate, and the remaining 12.9% fall into the 'Other' category.

Examining work experience, 43.3% of faculty members have 0-5 years, followed by 19% with 10-20 years, 13.4% with 5-10 years, and 24.3% with 20 years or more. In terms of experience with RPA technology, the majority (43.3%) has 0-1 year, offering insights into their familiarity with this technology.

Understanding these demographic details is crucial for interpreting the findings on RPA technology acceptance in the specific educational context of vocational colleges in Shaanxi Province.

Table 1. Demographic Information

Information		Frequency	Percent (%)
Gender	Male	123	31.1
	Female	272	68.9
Age	18-25	81	20.5
	26-30	96	24.3
	31-40	72	18.2
	41-50	85	21.5
	51-60	55	13.9
	60and above	6	1.5
Ddgree	Bachelor's degree	87	22
	Master's degree	201	50.9
	Doctor's degree	56	14.2
	Other	51	12.9
Length	0-5 years	171	43.3
	5-10 years	53	13.4
	10-20 years	75	19
	20 years or more	96	24.3
Experience	0-1 year	171	43.3
	1-2 years	78	19.7
	2-3 years	55	13.9
	3-4 years	33	8.4
	4 years or more	58	14.7

(2) Reliability and Validity Analysis

The reliability of a questionnaire signifies its stability and consistency. For internal consistency, it is generally recommended that Cronbach's Alpha should exceed 0.70, and the corrected item-total correlation (CITC) should be above 0.30, indicating strong stability, reliability, and consistency of the data. In this study, the questionnaire exhibits good reliability, meeting these criteria [9].

SPSS was utilized to conduct a reliability analysis on each variable in the formal survey. As shown in Table 2, all variables surpass the designated thresholds, indicating a high level of internal consistency.

Table 2. Results of the Reliability Analysis

Variable	Cronbach's Alpha
SI	0.911
JR	0.816
RD	0.863
CSE	0.877
FC	0.888
PU	0.887
PEOU	0.879
BI	0.877

In terms of validity, assessing the modified measurement model's fit indices (Table 3) reveals that absolute fit indices, relative fit indices, and parsimony fit indices either meet or exceed recommended benchmarks. This indicates a strong alignment between the model and the data, reflecting robust overall performance.

Table 3. Model Fit indices for Structural Model

Index	Suggested Value	Test Result	Fitness
Absolute Fit Indices			
X2/df	<3.00	1.934	Fitted
RMR	<0.05	0.034	Fitted
RMSEA	<0.05 (Excellent)	0.049	Fitted
GFI	>.90	0.860	Not fitted
Relative Fit Indices			
IFI	>.90	0.939	Fitted
TLI(NNFI)	>.90	0.933	Fitted
CFI	>.90	0.939	Fitted
Parsimony Fit Indices			
PGFI	>.50	0.741	Fitted
PNFI	>.50	0.802	Fitted
PCFI	>.50	0.854	Fitted

Within Confirmatory Factor Analysis (CFA), we considered Composite Reliability (CR) and Average Variance Extracted (AVE) as key metrics for evaluating convergent validity. Generally, CR values (typically above 0.6) and AVE values (greater than 0.5) suggest acceptable convergent validity, confirming the model's ability to explain significant differences among observed indicators [10]. Regarding discriminant validity, as shown in Table 4, the square root of each group's AVE values consistently exceeds the corresponding correlation coefficients between constructs, affirming sound discriminant validity for each measurement tool associated with individual constructs.

Table 4. Results of Average Variance Extracted and Composite Reliability

Variable	AVE	CR
SI	0.651	0.903
JR	0.597	0.816
RD	0.575	0.871
CSE	0.644	0.878
FC	0.620	0.890
PU	0.690	0.899
PEOU	0.606	0.885
BI	0.544	0.877

(3) Hypothesis Testing

After evaluating reliability and validity, we applied Structural Equation Modeling (SEM) for hypothesis testing. The estimate output, generated by AMOS software and displayed in Table 5, indicates that a substantial majority of hypotheses demonstrate statistical significance, implying meaningful relationships between the variables.

Table 5. Regression Weights

Path			Estimate	S.E.	C.R.	P
PU	<---	SI	0.346	0.063	5.289	***
PU	<---	JR	0.21	0.076	2.655	0.008
PU	<---	RD	0.138	0.07	2.001	0.045
PEOU	<---	CSE	0.266	0.049	5.152	***
PEOU	<---	FC	0.624	0.067	9.925	***
BI	<---	FC	0.283	0.069	3.641	***
BI	<---	PEOU	0.285	0.063	3.763	***
BI	<---	PU	0.394	0.041	7.994	***

***p<0.001.

The findings reveal that social influence (SI), job relevance (JR), and result demonstrability (RD) impact the perceived usefulness (PU) among higher vocational accounting lecturers. Computer self-efficacy (CSE) and facilitating conditions (FC) are crucial factors in explaining the perceived ease of use (PEOU) of RPA technology for accounting lecturers in higher vocational colleges. Both perceived usefulness (PU) and perceived ease of use (PEOU) are identified as essential predictors of lecturers' behavioral intention (BI) to integrate RPA technology into accounting education. Additionally, facilitating conditions (FC) significantly influence lecturers' behavioral intention (BI) regarding the adoption of RPA technology in accounting education. The support for H1-H8 in Table 6 underscores the validity of these established relationships.

Table 6. Result of Hypotheses Test

Hypotheses	Results
H1 Social Influence positively affects Perceived Usefulness.	Supported
H2 Job Relevance positively affects Perceived Usefulness.	Supported
H3 Result Demonstrability positively affects Perceived Usefulness.	Supported
H4 Computer Self-Efficacy positively affects Perceived Ease of Use.	Supported
H5 Facilitating Conditions positively influence Perceived Ease of Use.	Supported
H6 Perceived Usefulness positively affects Behavioral Intention.	Supported
H7 Perceived Ease of Use positively affects Behavioral Intention.	Supported
H8 Facilitating Conditions positively influence accounting lecturers continued use of RPA technology.	Supported

5. Suggested Strategies

Drawing on the empirical findings and practical experiences, the following strategic recommendations are proposed to enhance user acceptance of RPA technology and support its comprehensive development.

(1) Enhance Content Quality:

Given the direct and significant impact of perceived usefulness on the intention to use RPA technology, especially in accounting education, improving the content quality of RPA technology platforms is essential. The current lack of uniformity and coherence in the design philosophies among different companies leads to substantial gaps that must be addressed to elevate the content quality of RPA technology platforms in vocational colleges.

(2) Optimize Platform User Interface:

Recognizing the critical role of perceived ease of use, efforts should be directed toward improving the user-friendliness of RPA technology teaching platforms. Enhancements in usability across user interfaces and system settings are crucial to sustaining and enhancing the appeal of RPA technology for educational purposes.

(3) Increase Promotional Guidance:

To address the lack of awareness about RPA technology among university instructors, departments related to accounting should initiate promotional measures. Providing guidance to lecturers, creating awareness, and showcasing specific applications and benefits of RPA technology are essential to foster positive perceptions, behavioral intentions, and increased usage motivation.

Furthermore, creating a supportive environment for information technology use, incentivizing knowledge sharing, and enhancing social influence through learning groups and experience-sharing sessions can contribute to a positive adoption atmosphere. Consideration should also be given to individual differences in knowledge structure, information literacy, self-efficacy, cognitive levels, and domain knowledge. Teacher training programs and efforts to deepen instructors' understanding of RPA principles and capabilities are vital to influencing perceptions of its usefulness and ease of use.

(4) Provide Adequate Support and Resources:

Recognizing the impact of facilitating conditions on technology acceptance, ensuring sufficient resources, and support is crucial. Establishing an information technology support center, staffing a technology support team, offering assistance services, and providing training are essential steps to boost users' confidence in adopting RPA technology.

6. Conclusion

While acknowledging the limitations of our research, future studies should incorporate qualitative research designs and longitudinal data to gain deeper insights into the perceptions of Robotic Process Automation (RPA) users. Broadening the sample scope to include diverse regions, institution types, and demographic variables such as age and professional background would enhance the study's applicability. Furthermore, considering the dynamic nature of RPA technology, the inclusion of additional influencing factors can contribute to a more comprehensive understanding of RPA acceptance in the context of accounting education.

In conclusion, recognizing the constraints of this study and implementing the suggested directions for future research can facilitate a more nuanced understanding of the factors influencing the adoption of RPA in accounting education within vocational schools. This, in turn, can provide valuable insights for the future development of RPA technology in educational settings.

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References

[1] Hale, J. L., Householder, B. J., & Greene, K. L. (2002). The theory of reasoned action. The persuasion handbook: Developments in theory and practice, 14(2002), 259-286.

[2] LaCaille, L. (2020). Theory of reasoned action. Encyclopedia of behavioral medicine, 2231-2234.

[3] Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. Decision sciences, 27(3), 451-481.

[4] Fishbein, M., Ajzen, I., Albarracin, D., & Hornik, R. (2007). A reasoned action approach: Some issues, questions, and clarifications. Prediction and change of health behavior: Applying the reasoned action approach, 281-295.

[5] Hagger, M. S. (2019). The reasoned action approach and the theories of reasoned action and planned behavior.

[6] Venkatesh, V., & Davis, F. D. (2000). A theoretical extension of the technology acceptance model: Four longitudinal field studies. Management science, 46(2), 186-204.

[7] Venkatesh, V., & Bala, H. (2008). Technology acceptance model 3 and a research agenda on interventions. Decision sciences, 39(2), 273-315.

[8] Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. MIS quarterly, 425-478.

[9] Scarpelli, A. C., Paiva, S. M., Pordeus, I. A., Ramos-Jorge, M. L., Varni, J. W., & Allison, P. J. (2008). Measurement properties of the Brazilian version of the Pediatric Quality of Life Inventory (PedsQL™) cancer module scale. Health and quality of life outcomes, 6(1), 1-11.

[10] Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. Journal of marketing research, 18(1), 39-50.