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UNIVERSITY OF FINANCE – MARKETING**

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**THE RELATIONSHIP BETWEEN TECHNOLOGY READINESS,
TECHNOLOGY ACCEPTANCE AND WORK ENGAGEMENT
AMONG BANKING EMPLOYEES: THE MODERATING ROLE
OF SELF-EFFICACY**

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CHAPTER 1: RESEARCH OVERVIEW

1.1. The Necessity of the Study

1.1.1. Practical Context

In recent years, the banking sector has been widely recognized as one of the leading industries in the adoption of digital technologies and digital transformation initiatives. In Vietnam, Decision No. 810/QĐ-NHNN on the Digital Transformation Plan for the Banking Industry until 2025, with a vision toward 2030, sets ambitious targets stating that more than 70% of banking operations are expected to be conducted entirely in digital environments and over 80% of customer transactions will be carried out through digital channels. This transformation increases the demand for employees' technological adaptability while simultaneously creating significant changes in job stability and employee work engagement within the industry (Giang Hoang Nhon, 2017; Nguyen Nga, 2023).

Recent studies suggest that digital transformation is not merely a process of technological innovation but also a structural shift involving business models, operational processes, and organizational capabilities, in which the human factor plays a central role (Vial, 2019; Verhoef et al., 2021; Plekhanov et al., 2023). In Ho Chi Minh City - the largest financial center in Vietnam with a high concentration of joint-stock commercial banks—the need for developing human resources capable of adapting to the digital working environment has become increasingly urgent.

Although digital transformation in the banking sector has been progressing rapidly, employees' levels of technology readiness (TR) and technology acceptance (TA) still differ considerably and may influence their overall work engagement (WE). However, existing studies have not sufficiently clarified the integrated mechanism linking TR, TA, and WE, nor have they adequately examined the moderating role of self-efficacy (SE) in this relationship. Therefore, this study is necessary to clarify the mechanism

through which technological factors influence employee WE in joint-stock commercial banks in Ho Chi Minh City.

1.1.2. Theoretical Context

In the banking environment, employees' level of TA depends not only on system characteristics but also on their individual predispositions toward technology. On this basis, Lin et al. (2007) proposed the TR and TA Model (TRAM) by integrating TR into the TA Model (TAM) to enhance its explanatory power regarding the formation of perceived usefulness (PU) and perceived ease of use (PEOU) (Chiu & Cho, 2021; Cimbaljević et al., 2023). This approach is particularly appropriate in the banking context, where the intensity of technological innovation is high.

In addition, to explain the mechanism underlying the development of WE in a working environment undergoing significant changes due to digital transformation, the Job Demands–Resources (JD–R) model proposed by Demerouti et al. (2001) provides an important theoretical foundation for analyzing the role of job resources in shaping employees' motivation and attitudes.

Moreover, prior studies have shown that SE is positively associated with key components of the TA Model and contributes to promoting technology usage behavior (Park & Gursoy, 2012; Al-Gahtani, 2016).

Based on these theoretical foundations, this study adopts an integrated approach combining TRAM and the JD–R model to examine the effects of TR and TA on employees' WE in the banking sector, while also investigating the moderating role of SE in these relationships.

1.2. Overview of Related Studies

1.2.1. Overview of Studies on the Work Engagement of Banking Employees

The results of the analysis of the number of research publications by country, the analysis of research themes on employee engagement using VOSviewer, and the temporal keyword analysis of published studies on the

WE of banking employees indicate several notable patterns.

A synthesis of prior studies shows that employees' WE is developed on the basis of specific resources and working conditions, which can be classified into three main groups: (1) organizational factors, such as trust, corporate social responsibility, leadership style and human resource management practices; (2) job resources, including autonomy, job crafting, and support at work; and (3) personal resources, such as SE, the perception of meaningful work, and authenticity in behavior.

WE often serves as a mediating variable in the mechanism through which these resources influence outcomes such as performance, innovation, satisfaction, and intention to remain. Nevertheless, several research gaps remain, particularly in relation to cross-cultural studies, longitudinal research designs and multilevel interactions between individuals and organizations. Existing studies on WE have mainly focused on organizational, job-related, and personal resources, while giving limited attention to technology as a new form of resource in the context of digital banking.

1.2.2. Overview of Studies on the Relationship Between Technology Acceptance and Work Engagement

Previous studies have mainly examined the impact of TA on employees' WE from both positive and negative perspectives. A summary table of prior studies on the relationship between TA and WE is presented in Appendix 3.3. However, most existing studies on TA and WE have focused on the public service and education sectors, while the context of joint-stock commercial banks—where digital transformation exerts significant influence—has not been thoroughly examined.

In addition, only a limited number of studies have investigated the moderating role of individual factors, particularly SE, in the relationship between TA and WE. This represents an important research gap that warrants further investigation, especially in the context of Vietnamese banks entering a period of rapid digital transformation.

1.2.3. Overview of Studies on the Relationship Between Technology Readiness and Technology Acceptance

Previous studies on the relationship between TR and TA have provided substantial empirical evidence across various sectors and contexts. However, most of these studies have focused on industries such as e-commerce, education, or the public sector, while the banking industry—particularly in emerging economies such as Vietnam—remains relatively underexplored.

In terms of research content, many prior studies have primarily examined the direct effects of TR on TA, without fully clarifying the mediating mechanism through which TA translates TR into important work-related outcomes.

From a methodological perspective, most existing studies have employed cross-sectional survey designs, which impose certain limitations on causal inference among research variables. Moreover, many studies have examined the relationship between TR and TA mainly from technology-oriented perspectives without fully integrating theoretical frameworks on work motivation. This limitation reduces their explanatory power in clarifying how technological factors influence employees' psychological states and work-related behaviors.

1.3. Research Gap

Although TR and TA have been identified as important factors that may promote employees' WE, the mechanisms through which these factors interact still require further empirical examination in specific organizational contexts. In the banking sector, most studies on TA have primarily focused on customers' behavioral responses, whereas employees—who directly use and adapt to technology in their daily work—have not been sufficiently examined.

In addition, existing studies have typically applied theoretical frameworks such as the TAM, TRAM, or the JD-R model separately, while

integrated approaches that simultaneously examine the relationships among TR, TA, and WE remain limited. Furthermore, the moderating role of SE in the relationship between TA and WE has not been adequately examined in the context of the banking sector.

1.4. Research Objectives

1.4.1. General Research Objective

To examine the effects of TR and TA on the WE of banking employees, with the moderating role of SE.

1.4.2. Specific Research Objectives

(1) To develop a research model examining the relationships among TR, TA, and WE of banking employees, with the moderating role of SE;

(2) To analyze and test the effects of technology readiness conceptualized as technology readiness (PTR) and negative technology readiness (NTR) on the TA of employees in joint-stock commercial banks;

(3) To examine the effects of TA on the WE of employees in joint-stock commercial banks, thereby clarifying the role of TA as an important antecedent that promotes positive psychological states and constructive work behaviors in the context of increasingly extensive technology adoption;

(4) To test the moderating role of SE by examining how different levels of SE alter the strength of the relationships between PU and PEOU and TA, as well as the relationship between TA and WE. Accordingly, the study clarifies the role of SE in strengthening or weakening the influence of technological factors on employees' work attitudes and behaviors in joint-stock commercial banks;

(5) To examine the mediating role of technology acceptance in the relationship between TR and WE. Specifically, the study investigates TA as a mediating mechanism in the relationships between PTR and WE, as well as between NTR and WE, thereby clarifying the pathways through which employees' TR is translated into their level of WE;

(6) To propose several managerial implications aimed at enhancing TR,

TA, SE, and WE among employees in joint-stock commercial banks.

1.5. Research Questions

(1) Can a research model be developed to examine the relationships among TR, TA, and WE of banking employees, with the moderating role of SE?

(2) How does employees' TR influence their TA in joint-stock commercial banks?

(3) How does TA influence the WE of employees in joint-stock commercial banks?

(4) Does SE moderate the strength of the relationships between (i) PU and TA, (ii) PEOU and TA, and (iii) TA and WE?

(5) Does TA play a mediating role in the relationships between TR (PTR and NTR) and WE?

(6) What managerial implications can be proposed to enhance the effectiveness of technology adoption and the WE of employees in joint-stock commercial banks?

1.6. Research Subjects

The research subject of this study is the effects of TR and TA on the WE of banking employees, with the moderating role of SE.

The survey subjects of the quantitative study are employees currently working at joint-stock commercial banks in Ho Chi Minh City.

1.7. Research Scope

Regarding the geographical scope, the study was conducted at joint-stock commercial banks in Ho Chi Minh City.

Regarding the time scope, the survey was conducted from May 2025 to October 2025.

Regarding the research content scope, the study focuses on clarifying the concepts of TR, TA, WE, and SE among employees of joint-stock commercial banks. The study is limited to examining the direct effects of TR

and TA on WE, while also investigating the moderating role of SE in the relationships between PU and TA, between PEOU and TA, and between TA and WE, together with the mediating role of TA in the relationship between TR and WE.

1.8. Research Methods

The study adopts a mixed-methods approach, combining both qualitative and quantitative research methods.

1.9. Contributions of the Study

The study makes contributions in both theoretical and practical aspects.

1.10. Structure of the Dissertation

The dissertation is structured into five chapters as follows:

Chapter 1: Research Overview

Chapter 2: Theoretical Background and Research Model

Chapter 3: Research Methodology

Chapter 4: Research Results and Discussion

Chapter 5: Conclusions and Managerial Implications

CHAPTER 2: THEORETICAL BACKGROUND AND RESEARCH MODEL

2.1. Research Constructs

2.1.1. Technology Readiness

Parasuraman and Colby (2015) emphasized that TR represents a relatively stable individual predisposition toward accepting and using new technologies, and conceptualized it as a multidimensional construct consisting of enabling factors (optimism and innovativeness) and inhibiting factors (discomfort and insecurity).

Dimensions of Technology Readiness:

Optimism reflects the extent to which individuals hold positive views toward technology and believe that the use of technology can enhance their

control over work, increase flexibility, and improve work efficiency and productivity (Parasuraman, 2000; Caison et al., 2008).

Innovativeness refers to individuals' tendency to experiment with and adopt new technologies earlier than others, while also acting as pioneers in technology-related thinking and behavior (Parasuraman, 2000; Parasuraman & Colby, 2015).

Discomfort refers to individuals' perceived lack of control and feelings of stress or overload when interacting with technology, particularly in situations involving complex technologies or rapid technological changes (Berndt et al., 2010; Erdoğan & Esen, 2011).

Insecurity relates to individuals' skepticism and lack of trust in the reliability and security of technology, as well as concerns that technology may not function as expected (Parasuraman & Colby, 2001; Erdoğan & Esen, 2011).

2.1.2. Technology Acceptance

TA is understood as the process through which employees form evaluations of a technology, develop intentions to use it, and subsequently express these intentions through actual usage behavior in their work. TA refers to the extent to which individuals are willing to accept a particular technology and their attitudes toward it, which are influenced by PU and PEOU.

2.1.3. Self-Efficacy

SE is defined as an individual's core belief in their capability to organize and execute the courses of action required to effectively manage and handle specific situations. It plays a crucial role in shaping work motivation, guiding behavioral choices, and influencing proactive adaptation. In addition, SE may enhance individuals' propensity to accept and use technology and is expected to moderate the relationships between key technology-related perceptions and WE in organizational contexts (Bandura, 1997).

2.1.4. Work Engagement

WE is defined as a positive and relatively stable psychological state of employees in the course of their work, consisting of three core dimensions: vigor, dedication, and absorption (Schaufeli et al., 2002; Schaufeli & Salanova, 2007).

2.2. Theoretical Foundations

2.2.1. Integrated Model: Technology Readiness and Acceptance Model

TRAM has been widely applied in various contexts, particularly in the service and financial sectors. Previous seminal studies indicate that TR indirectly influences behavioral outcomes through PU and PEOU, thereby reinforcing the empirical validity of TRAM in predicting behavioral responses following TA (Son & Han, 2011).

TRAM not only facilitates the integration of individual and system-related factors but also demonstrates strong applicability in the context of digital transformation in financial services. Accordingly, it provides an appropriate theoretical framework for analyzing employees' TA behavior in the banking sector.

2.2.2. Job Demands–Resources (JD–R) Model

JD–R model is employed as a foundational theoretical framework to clarify the relationships among TR, TA, and employees' WE in the banking sector. According to the JD–R model, factors in the work environment can be classified into job demands and job resources, which in turn influence employees' motivation and psychological states.

2.3. Research Hypotheses

2.3.1. Effects of Technology Readiness on Technology Acceptance

H1a: PTR has a positive effect on PU.

H1b: PTR has a positive effect on PEOU.

H1c: PTR has a positive effect on TA.

H2a: NTR has a negative effect on PU.

H2b: NTR has a negative effect on PEOU.

H2c: NTR has a negative effect on TA.

H3: PEOU has a positive effect on TA among employees in joint-stock commercial banks.

H4: PU has a positive effect on TA among employees in joint-stock commercial banks.

2.3.2. Effects of Technology Acceptance on Work Engagement

H5: TA has a positive effect on WE.

2.3.3. The Moderating Role of Self-Efficacy

H6: SE moderates the relationship between PU → TA

H7: SE moderates the relationship between PEOU → TA

H8: SE moderates the relationship between TA → WE.

2.3.4. The Mediating Role of Technology Acceptance in the Relationship Between Technology Readiness and Work Engagement

H9: TA mediates the relationship between PTR → WE.

H10: TA mediates the relationship between NTR → WE.

2.4. Research Model

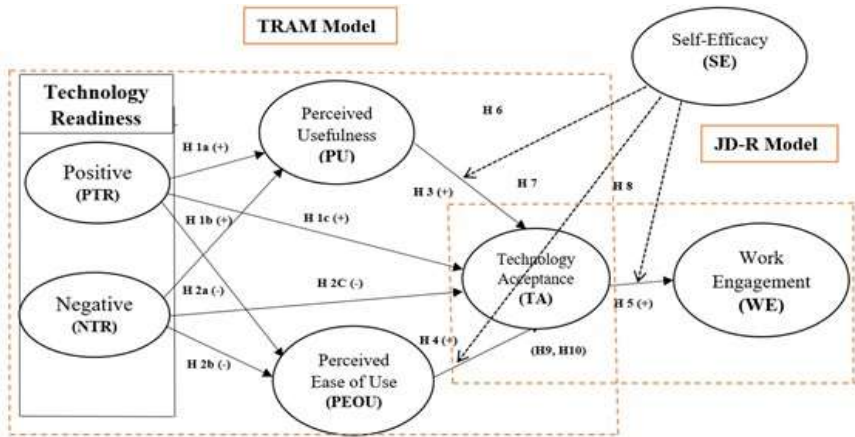


Figure 2.3: Proposed Research Model

Source: Proposed by the author

CHAPTER 3: RESEARCH DESIGN

3.1. Research Procedure

The overall research procedure is summarized in Figure 3.1, which illustrates the sequential stages of the study from qualitative to quantitative approaches. The research process consists of three main phases: Phase 1: Qualitative research; Phase 2: Preliminary quantitative research; and Phase 3: Main quantitative research.

3.2. Measurement Scales of Research Constructs

Technology Readiness (TR): The TR Index (TRI 2.0) developed by Parasuraman and Colby (2015) was employed to measure individuals' readiness to use technology.

Technology Acceptance: A 12-item scale developed by Davis (1989) was used to measure the two sub-dimensions of TR, including six items for PU and six items for PEOU. In addition, five items measuring employees' TR were specifically adapted for this study based on the work of Venkatesh et al. (2003).

Work Engagement: WE was measured using the unidimensional UWES-9 scale developed by Schaufeli et al. (2006).

Self-Efficacy: SE was measured using the eight-item New General SE scale developed by Chen, Gully, and Eden (2001).

3.3. Qualitative Research

3.3.1. Expert Interview Method

The author employed individual in-depth interviews with experts instead of focus group discussions.

3.3.2. Selection of Expert Participants

Experts were defined as individuals possessing either specialized knowledge or practical experience of at least five years, directly related to the application of technology in their work.

3.3.3. Design of the Expert Interview Protocol

The expert interview protocol was designed in a semi-structured format to allow participants to express their perspectives flexibly, while also enabling the researcher to adjust questions and further explore emerging issues during the interview process.

3.3.4. Data Collection Method

Data were collected using paper-based or electronic interview forms, conducted either through face-to-face interviews or telephone interviews.

3.3.5. Data Analysis Techniques

The raw data obtained from the expert interview forms were compiled and summarized in tabular format. Based on these results, the researcher conducted comparative analysis and synthesis to derive the preliminary findings of the qualitative study, which served as a foundation for designing the preliminary survey questionnaire.

3.3.6. Results of the Qualitative Study

The expert interviews were conducted from March to April 2025. The researcher approached the experts through two methods: face-to-face interviews (involving 12 experts) and telephone discussions combined with emailed interview forms for experts located in distant areas (involving 4 experts). In total, 16 experts participated in the qualitative study.

3.3.7. Scale Refinement

The refined measurement scales are presented in detail in Appendices 5.1, 5.2, 5.3, and 5.4.

3.4. Preliminary Quantitative Research

3.4.1. Sample and Sampling Method

The preliminary quantitative study employed a convenience sampling method at bank branches and transaction offices through professional connections with managers at joint-stock commercial banks. To reduce potential sampling bias, the study established minimum target sample sizes across key respondent characteristics, including gender, age, educational level, work experience, income level, and job function.

3.4.2. Data Processing Tools and Methods

In the preliminary research stage, **SmartPLS 4** was used to assess the **measurement model** in order to evaluate the reliability and validity of the measurement scales prior to conducting the main survey.

3.4.3. Results of the Preliminary Quantitative Study

The preliminary survey was conducted between April and May 2025. As of May 20, 2025, a total of 147 questionnaires were distributed, of which 130 responses were collected. After data screening, 125 valid responses were retained for analysis, while five responses were excluded due to incomplete or inconsistent information.

The results of the preliminary measurement model assessment indicated that 49 out of 50 observed variables met the reliability requirements based on the outer loading criteria. However, the observed variable WE9, belonging to the WE scale, had an outer loading value below 0.40 and was therefore removed from the model following the recommendation of Hair et al. (2019). After refinement, the remaining measurement scales satisfied the requirements for indicator reliability, convergent validity, discriminant validity, and multicollinearity diagnostics, confirming their suitability for use in the main quantitative study.

3.5. Design of the Main Quantitative Study

3.5.1. Sample and Sampling Method

The main survey included a sample of 500 employees working at joint-stock commercial banks in Ho Chi Minh City.

In the sampling design, the study employed a stratified sampling approach based on bank size (large, medium, and small banks), combined with a snowball sampling technique within each stratum to facilitate access to eligible respondents.

3.5.2. Data Collection Method

Given the specific characteristics of the banking sector, administering the survey using paper-based questionnaires was considered appropriate for practical implementation and for ensuring control over the sample structure

in accordance with the stratified sampling design.

3.5.3. Data Processing Tools and Methods

In this study, the data analysis procedure was conducted in two stages with the support of SPSS 26 and SmartPLS 4 to ensure the comprehensiveness, scientific rigor, and reliability of the research results. Descriptive statistical analysis was performed using SPSS 26, while SmartPLS 4 was employed to evaluate both the measurement model and the structural model using the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach.

3.5.4. Data Analysis Procedures

The data analysis procedure was conducted through the following steps: descriptive statistical analysis of the survey sample; assessment of common method bias; evaluation of the measurement model; and evaluation of the structural model.

CHAPTER 4: RESEARCH RESULTS AND DISCUSSION

4.1. Description of the Main Survey Sample

Data were collected through a direct survey using paper-based questionnaires administered to employees of joint-stock commercial banks in Ho Chi Minh City. A total of 575 questionnaires were distributed, of which 500 valid responses were retained for analysis, representing a response rate of 86,96%. The sample distribution was relatively balanced across key demographic characteristics, including gender, age, educational level, work experience, income level, and job function.

4.2. Assessment of Common Method Bias

4.2.1. Harman's Single-Factor Test

The results of Harman's single-factor test indicate that the largest factor explained 32,412% of the total variance, which is substantially lower than the recommended threshold of 50% (Tehseen et al., 2017). This result

suggests that common method bias is unlikely to pose a serious threat and does not significantly affect the reliability of the study's findings.

4.2.2. Variance Inflation Factor (VIF) Assessment

The indicators in the model showed VIF values ranging from 1.702 to 2.626, which are substantially lower than the recommended threshold of 3.3. These results indicate that there is no evidence of unusually high linear correlations among the indicators and, at the same time, provide no indication of the presence of common method bias (CMB) in the current dataset.

4.3. Measurement Model Assessment

4.3.1. Stage 1: Assessment of the Measurement Model for First-Order Constructs

The results of the overall measurement model assessment indicate that the observed variables associated with each construct (first-order latent variables) were appropriate for measuring their respective constructs. Furthermore, all constructs satisfied the requirements for convergent validity and discriminant validity, confirming the adequacy of the measurement model at the first-order construct level.

4.3.2. Stage 2: Evaluation of the Second-Order Measurement Model

The results of the overall measurement model assessment indicate that the observed variables associated with each construct (second-order latent variables) are appropriate for measuring their respective constructs. In addition, all constructs satisfy the requirements for convergent validity and discriminant validity

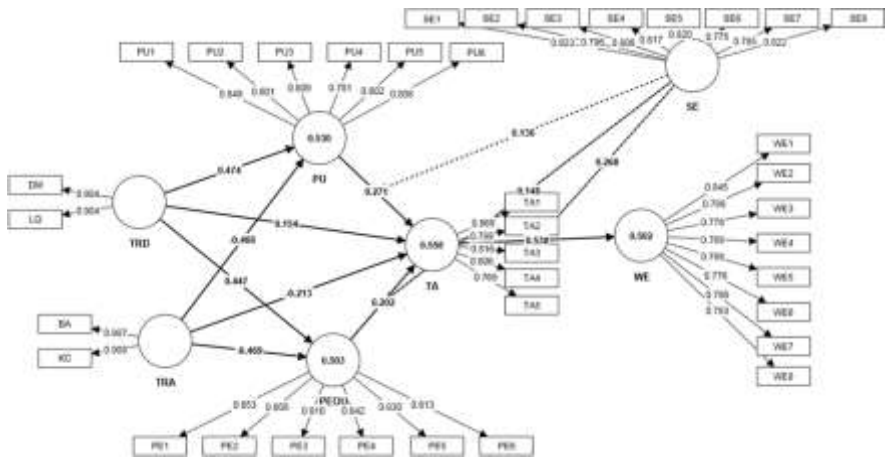


Figure 4.2: Measurement Model Results of the Second-Order Constructs (Stage 2)

Source: Author's data analysis using SmartPLS 4 software

4.4. Structural Model Assessment

4.4.1. Assessment of Collinearity in the Structural Model

All VIF values are below 3,3, with the highest value being 2,199 (see Table 4.10). This evidence confirms that multicollinearity is not present in the structural model.

Table 4.10: VIF Values of the Constructs

	PEOU	PU	TA	WE
PEOU			2,137	
PU			2,199	
SE			1,091	1,116
TA				1,157
NTR	1,042	1,042	1,841	
PTR	1,042	1,042	1,822	
WE				

Source: Author's data analysis using SmartPLS 4 software

4.4.2. Hypothesis Testing

The results presented in Table 4.11 show that all hypotheses from H1 to H5 have p-values lower than 0,05, indicating that H1a, H1b, H1c, H2a, H2b,

H2c, H3, H4, and H5 are all supported.

Table 4.11: Results of Direct Effects Testing

Research hypotheses	Path coefficient (β)	Standard deviation	T-value	P-value	Result
H1a: PTR -> PU	0,474	0,029	16,090	0,000	Supported
H1b: PTR -> PEOU	0,447	0,031	14,330	0,000	Supported
H1c: PTR -> TA	0,154	0,040	3,851	0,000	Supported
H2a: NTR -> PU	-0,466	0,030	15,511	0,000	Supported
H2b: NTR -> PEOU	-0,469	0,029	16,327	0,000	Supported
H2c: NTR -> TA	-0,213	0,042	5,084	0,000	Supported
H3: PEOU -> TA	0,202	0,047	4,327	0,000	Supported
H4: PU -> TA	0,271	0,046	5,851	0,000	Supported
H5: TA -> WE	0,538	0,037	14,651	0,000	Supported

Source: Author's data analysis using SmartPLS 4 software

The results of the indirect effects analysis in the research model (Table 4.12), obtained using the bootstrap procedure, indicate that all mediating relationships are statistically significant at the 95% confidence level. Therefore, Hypotheses H9 and H10 are supported.

Table 4.12: Results of the Indirect Effects Analysis

Research hypotheses	Path coefficient (β)	Standard deviation	T-value	P-value	Result
H9: PTR -> TA -> WE	0,083	0,022	3,716	0,000	Supported
H10: NTR -> TA -> WE	-0,115	0,024	4,829	0,000	Supported

Source: Author's data analysis using SmartPLS 4 software

4.4.3. Moderating Effects Analysis

The results presented in Table 4.13 indicate that Hypotheses H6, H7, and H8 are supported. The study further conducted simple slope analyses to examine the relationships between PEOU and TA, PU and TA, and TA and

WE at three different levels of SE. The results are illustrated in Figures 4.3, 4.4, and 4.5.

Table 4.13: Results of the Moderating Effects Analysis of Self-Efficacy

Research hypotheses	Path coefficient (β)	Standard deviation	T-value	P-value	Result
H6: SE x PU -> TA	0,136	0,038	3,634	0,000	Supported
H7: SE x PEOU -> TA	0,148	0,039	3,850	0,000	Supported
H8: SE x TA -> WE	0,268	0,038	7,096	0,000	Supported

Source: Author's data analysis using SmartPLS 4 software

4.4.4. Assessment of the R² Coefficient

According to the criteria proposed by Hair et al. (2019; 2021), an R² value ranging from 0.50 to below 0.75 is considered to indicate a moderate level of explanatory power.

The results suggest that the research model demonstrates good predictive capability and an acceptable level of model fit for the endogenous constructs PEOU, PU, TA, and WE.

Table 4.14: Coefficient of Determination (R²)

	R ²	Adjusted R ²
PEOU	0,503	0,501
PU	0,530	0,528
TA	0,558	0,551
WE	0,502	0,499

Source: Author's data analysis using SmartPLS 4 software

4.4.5. Assessment of Effect Size (f²)

The independent variables exhibit small to large effect sizes on their corresponding dependent variables, thereby making meaningful contributions to the explanatory power of the structural model.

Table 4.15: Effect Size (f^2) Values

Research hypotheses	f^2	Effect Size	Research hypotheses	f^2	Effect Size
H1a: PTR -> PU	0,459	Large	H3: PEOU -> TA	0,043	Small
H1b: PTR -> PEOU	0,386	Large	H4: PU -> TA	0,076	Small
H1c: PTR -> TA	0,029	Small	H5: TA -> WE	0,503	Large
H2a: NTR -> PU	0,443	Large	H6: SE x PEOU -> TA	0,032	Small
H2b: NTR -> PEOU	0,425	Large	H7: SE x PU -> TA	0,028	Small
H2c: NTR -> TA	0,056	Small	H8: SE x TA -> WE	0,125	Small

Source: Author's data analysis using SmartPLS 4 software

4.4.6. Predictive Relevance (Q^2)

As shown in Table 4.16, all Q^2 values are positive and mainly range from 0.308 to 0.358, indicating that the model demonstrates a moderate level of predictive relevance for the endogenous constructs.

Table 4.16: Predictive Relevance (Q^2)

	SSO	SSE	$Q^2 (=1-SSE/SSO)$	predictive relevance
NTR	1000	1000		
PTR	1000	1000		
PEOU	3000	1981,518	0,339	Medium
PU	3000	1972,713	0,342	Medium
TA	2500	1604,008	0,358	Medium
WE	4000	2766,505	0,308	Medium

Source: Author's data analysis using SmartPLS 4 software

4.4.7. Assessment of Model Fit in PLS-SEM

The research model demonstrates a good level of fit with the data and satisfies the requirements for overall model fit within the PLS-SEM framework.

Table 4.17: Results of Model Fit Assessment

	Saturated model	Estimated model
SRMR	0,037	0,062
d_ULS	0,973	2,743
d_G	0,408	0,440
Chi-square	1.211,640	1.281,745
NFI	0,896	0,889

Source: Author's data analysis using SmartPLS 4 software

4.5. Discussion of Research Findings

4.5.1. Summary of the Results from the Preliminary Study

4.5.2. Summary of the Results from the Main Study

4.5.3. Discussion of the Hypothesis Testing Results

PTR has a positive and significant effect on PU, PEOU, and TA, whereas NTR has a negative and significant effect on PU, PEOU, and TA, supporting the assumptions of the TRAM framework.

Both PEOU and PU have positive and significant effects on TA, consistent with the TAM model.

TA has a strong positive and significant effect on WE, supporting the JD–R theoretical perspective.

SE shows a positive moderating effect on the relationships between PU → TA, PEOU → TA, and TA → WE.

Furthermore, PTR has an indirect positive effect on WE through TA, whereas NTR has an indirect negative effect on WE through TA, confirming the mediating role of TA in the relationship between TR and WE in line with TRAM and JD–R.

CHAPTER 5: CONCLUSIONS AND MANAGERIAL IMPLICATIONS

5.1. Conclusions

First, the results confirm the existence of an indirect relationship between TR and WE through the mediating role of TA. Specifically, PTR positively affects PU and PEOU, thereby increasing employees' TA, whereas NTR negatively affects these perceptions and reduces TA. Through TA, both PTR and NTR influence WE in different directions.

Second, the study provides empirical evidence supporting the central role of TA in promoting WE. Consistent with TAM, both PU and PEOU have positive and statistically significant effects on TA. At the same time, TA acts as a key mediating mechanism linking TR to WE. These findings indicate that in the context of digital banking transformation, WE is strengthened when employees accept and are willing to use technology in their work rather than relying solely on their initial level of TR.

Third, the results clarify the important moderating role of SE in the relationship between technology-related perceptions and WE. SE strengthens the effects of PU and PEOU on TA, and also enhances the impact of TA on WE. This suggests that employees with higher SE are more likely to develop stronger TA and more effectively translate TA into higher WE. Therefore, SE functions as an important personal resource that amplifies the positive effects of technology on WE in the digital transformation process of NH TMCP.

5.2. Managerial Implications

5.2.1. Implications for WE

Maintaining and enhancing WE among employees in joint-stock commercial banks largely depends on the effective integration of technology management and human resource management. When technology is accepted, mastered, and associated with positive work experiences, banks

can not only improve operational efficiency but also establish a solid foundation for retaining and developing high-quality human resources in an increasingly competitive environment.

5.2.2. Implications for Employees' Technology Acceptance

Managers of joint-stock commercial banks should position technology as a work-supporting resource rather than a source of pressure for employees. This requires banks to enhance employees' ability to effectively use technology through practice-oriented training linked to operational tasks, workplace mentoring mechanisms (e.g., key users), simulated data environments, and integrated system-based support tools.

In addition, joint-stock commercial banks should ensure that technology platforms genuinely support work processes rather than creating additional administrative burdens or parallel procedures. This can be achieved by standardizing user experience, ensuring system performance, and providing intelligent on-site support, thereby strengthening employees' TA in the context of digital transformation.

5.2.3. Implications for Employees' Technology Readiness

Joint-stock commercial banks should continue strengthening internal communication and implementing appropriate support initiatives to reinforce employees' positive perceptions, thereby facilitating the process of TR and application in the context of digital transformation.

At the same time, joint-stock commercial banks should address NTR as a set of psychological barriers that need to be systematically managed through solutions aimed at reducing difficulties in technology interaction and lowering employees' perceived risks when using new technologies.

5.2.4. Implications for SE

Joint-stock commercial banks should strengthen digital skills training aligned with practical job requirements while enhancing technical support and developing a digital learning environment within the organization to improve employees' confidence and capability in using technology.

A suitable approach is to design tiered digital skills training programs linked to job positions, including foundational training for employees with limited digital skills, application-oriented training for regular users, and advanced training for core staff. This structured approach can effectively strengthen employees' SE in the context of digital transformation.

5.3. Contributions of the Study

5.3.1. Theoretical Contributions

This study makes an important contribution to the literature on TA behavior in the banking organizational context by integrating the TRAM and JD-R frameworks.

In addition, the study extends the TRAM framework by incorporating SE as a moderating variable, thereby clarifying the psychological mechanism through which SE strengthens the effects of PU, PEOU $\rightarrow$ TA and TA $\rightarrow$ WE.

5.3.2. Practical Contributions

This study not only helps bank managers identify employees' technology-related drivers and barriers, but also proposes practical digital human resource management strategies aimed at enhancing productivity, improving service quality, and sustaining competitive advantage in the context of digital transformation.

5.4. Limitations and Directions for Future Research

The survey sample was mainly drawn from employees of joint-stock commercial banks in Ho Chi Minh City; therefore, the findings primarily reflect an urban context and may not fully represent the nationwide banking system. In addition, the sample was relatively young and largely concentrated among frontline staff with less than 10 years of work experience, which may have resulted in higher observed levels of TR and TA and a relatively optimistic interpretation of the findings. Future studies should expand the sample across regions, increase representation across departments and tenure groups, and conduct comparative analyses among

different types of financial institutions to improve the robustness and generalizability of the model.

This study did not examine differences across demographic groups, particularly by age and work experience, through multi-group analysis (MGA). The absence of MGA may limit the ability to identify potential differences in the structural relationships across groups. Future research is therefore recommended to apply MGA to provide more group-specific managerial implications.

In addition, this study employed PLS-SEM with cross-sectional data, which does not capture changes in TA over time. Future research may adopt longitudinal designs or additional multi-group analyses to examine the stability of the proposed relationships.

Finally, the current model did not consider the effects of organizational culture, leadership style, or job demands on WE. Future studies may incorporate additional organizational mediating or moderating variables (e.g., work environment or organizational support) to improve the explanatory power of the model.