



Determinants of Chinese Language Learning Demand: Evidence from North Central Vietnam

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ABSTRACT: In the context of increasing economic integration, Chinese language proficiency has become an important asset for workforce competitiveness in Vietnam. This study investigates the factors influencing the demand for learning Chinese in the North Central region of Vietnam. Based on the theoretical foundations of foreign language learning motivation, the Theory of Planned Behavior, and Self-Determination Theory, a research model was developed and empirically tested using survey data from 489 respondents aged 15–35. The results of the SEM analysis indicate that the model achieves a good fit ($\chi^2/df = 1.70$, CFI = 0.967, TLI = 0.959, RMSEA = 0.054). Among the examined factors, employment opportunities ($\beta = 0.537$, $p < 0.001$) and information technology ($\beta = 0.486$, $p < 0.001$) have significant positive effects on learning demand, with employment opportunities exerting the strongest influence. In contrast, learning attitude and gender differences are not statistically significant ($p > 0.05$). These findings highlight the dominant role of practical and contextual factors over individual psychological traits in shaping language learning demand. The study contributes to the literature by providing empirical evidence from a less-explored regional context and offers practical implications for aligning language training programs with labor market needs and enhancing technology-supported learning environments.

KEYWORDS: Chinese language; learning motivation; educational demand; North Central Vietnam

1. Introduction

In the context of globalization and deepening economic integration, foreign language competence has become increasingly important for knowledge access, employment opportunities, and workforce competitiveness [1]. According to UNESCO, the shift of global economic power toward Asia has encouraged the diversification of foreign language choices, with Chinese emerging as a strategic language in education and the international labor market [2]. Currently, approximately 1.2 billion people use Chinese. It ranks second in the world in terms of total speakers and first in terms of native speakers [3]. A report from the Ministry of Foreign Affairs of China indicates that by 2023, more than 30 million people were learning Chinese across over 180 countries and territories [4]. At the same time, China is the second-largest economy in the world, accounting for about 16.9% of global GDP according to World

Bank data in 2024. China is also increasing its influence in global supply chains, international trade, and cross-border investment [5]. Gil Jeffrey argues that the expansion of China's economic and political influence is a key driver of the growing number of Chinese language learners [6]. The British Council also classifies Chinese as a language with high strategic value for career competitiveness and international economic cooperation [7]. This trend reflects a clear shift in foreign language choice, with Chinese increasingly viewed as a strategic tool for enhancing career competitiveness in the context of expanding economic cooperation with China.

In Vietnam, Chinese has become one of the most prioritized foreign languages after English. This trend is driven by increasingly close economic, trade, and investment relations between Vietnam and China. According to data from the General Department of Vietnam Customs in 2024, bilateral trade turnover between Vietnam and China exceeded 171 billion USD, accounting for the largest share of Vietnam's total import and export value [8]. In addition, China is currently one of the largest foreign investors in Vietnam, with 6,386 valid investment projects [9]. These figures indicate a growing demand for human resources with Chinese language proficiency. In the North Central region of Vietnam, economic and industrial growth has been relatively rapid and is supported by strong investment from Chinese enterprises. According to the General Statistics Office of Vietnam in 2025, the average GRDP growth rate in this region reached approximately 7.2 percent per year during the period from 2020 to 2024 [10]. The development of economic zones such as Nghi Son Economic Zone, Vung Ang Economic Zone, and Chan May–Lang Co Economic Zone has attracted many enterprises cooperating with Chinese partners, thereby increasing the demand for employees who can use Chinese. In addition, the tourism sector in this region is recovering strongly. Chinese tourists consistently rank among the largest groups of international visitors to Vietnam, accounting for about 32% of total international arrivals [11,12]. Therefore, the development of Chinese language programs in this region plays an important role in economic growth and income improvement.

Research in language education has consistently examined factors that influence learners' needs. According to the theory of foreign language motivation proposed by Robert Gardner, the demand for language learning is strongly influenced by integrative and instrumental motivation, with career opportunities and economic benefits considered key drivers in language choice [13]. Zoltán Dörnyei (2009) emphasizes that language learning demand is also shaped by future self-image, the social environment, and the global economic context [14]. In addition, many studies on language learning demand in the context of globalization show that learners tend to choose languages that offer career advantages and opportunities for international integration [15,16]. These findings indicate that language learning demand is not only based on personal interest but is also closely linked to changes in the labor market and trends in economic integration.

Although many studies in Vietnam have examined foreign language learning motivation, most have focused on major urban areas such as Hanoi and Ho Chi Minh City [17,18]. Research on the demand for learning Chinese in the North Central region remains limited, particularly quantitative studies using Structural Equation Modeling (SEM) to examine the relative effects of economic, social, and occupational factors on learning demand. Meanwhile, this region has distinct socio-economic characteristics that may lead to notable differences in language learning behavior and demand compared with other regions. This gap forms the basis of the

present study. Therefore, this study aims to explore and analyze the factors influencing the demand for learning Chinese in the North Central region of Vietnam. It identifies the main determinants shaping learners' decisions, measures the impact of each factor, evaluates their relative importance within the research model, and tests the proposed hypotheses. In addition, the study provides a scientific basis for educational policy development, curriculum design, and strategic human resource planning, aligned with regional and international economic integration.

2. Materials and Methods

2.1. Scope and participants.

The study was conducted in five provinces in the North Central region of Vietnam. These include Thanh Hoa, Nghe An, Ha Tinh, Quang Tri, and Thua Thien Hue (Figure 1). This region has experienced relatively rapid socio-economic development. It has also seen a notable increase in economic, trade, and investment cooperation with China. These conditions have led to a growing demand for human resources with Chinese language proficiency. The target population consisted of individuals aged 15 to 35 residing in the selected provinces. This group was chosen because it represented a young labor force with strong learning needs and high access to employment opportunities in the context of integration. Research data were collected through a questionnaire survey. A total of 489 responses were obtained, and valid responses were retained for subsequent analysis.

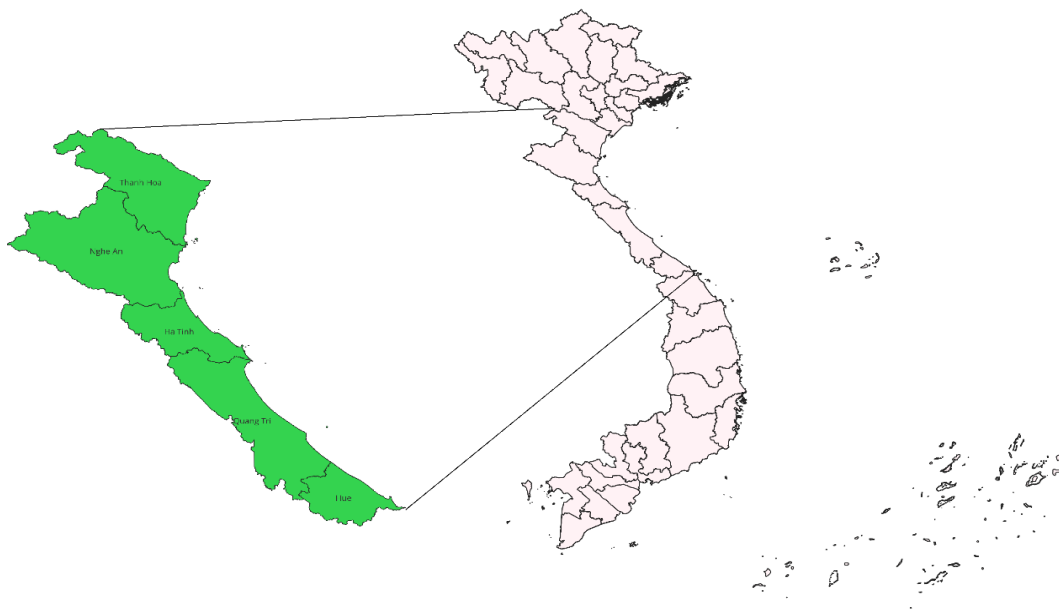


Figure 1. North Central Region of Vietnam.

2.2. Research model.

The proposed research model assumes that the demand for learning Chinese is shaped by both individual characteristics and learning support conditions. It is grounded in foreign language motivation theory, the Theory of Planned Behavior (TPB), and Self-Determination Theory (SDT). However, rather than simply applying these established frameworks, this study adapts

them to the socio-economic context of North Central Vietnam. In this setting, language learning decisions may be influenced more by practical external factors than by purely psychological determinants. At the individual level, learning demand is influenced by information technology competence, awareness of global differences, learning attitude, proactiveness, self-discipline, career opportunities, and job requirements related to Chinese. These factors reflect perceived benefits and motivation. According to TPB, attitude, subjective norms, and perceived behavioral control are key predictors of behavioral intention [19]. Career opportunities and job requirements can also be explained by Gardner's foreign language motivation theory, in which instrumental motivation plays a central role [20]. Proactiveness and self-discipline are associated with SDT, which emphasizes intrinsic motivation and perceived competence in sustaining long-term learning behavior [21]. Several contextual factors also influence learning decisions. These include technological convenience, access to quality training programs, diverse learning modes, reasonable costs, reliable materials, and a supportive environment. Previous studies have shown that these factors influence foreign language learning intention [22, 23]. Figure 2 shows research model of factors affecting the demand for learning Chinese.

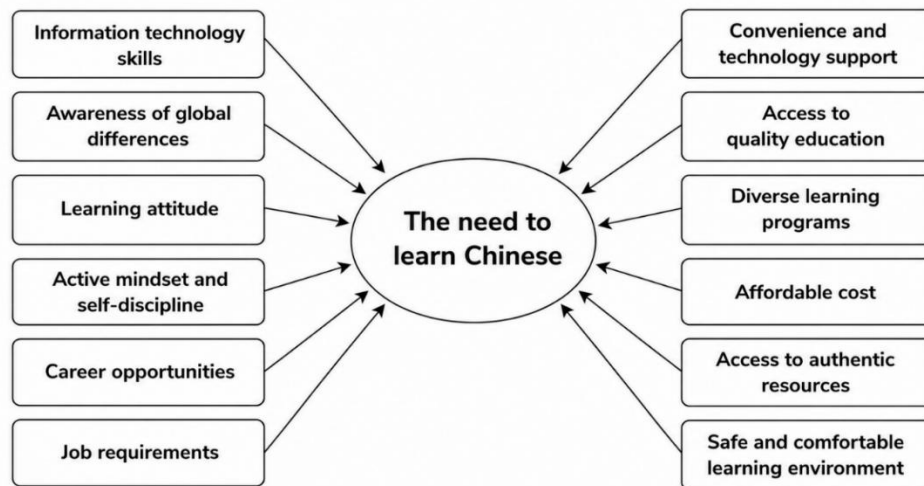


Figure 2. Research model of factors affecting the demand for learning Chinese.

Based on the proposed research model and the developed hypotheses, the study constructs measurement scales to assess the concepts in the model. The scales are adapted to fit the context of Chinese language learning demand in the North Central region of Vietnam. Learning attitude reflects learners' motivation and perceived benefits of studying Chinese. Perceived flexibility, supporting tools and technology, and information technology skills are relevant because Chinese learning increasingly relies on flexible learning modes and digital platforms. Trust in training quality, training support, and training program influence learners' confidence in course effectiveness and expected outcomes. Learning cost is an important factor in Vietnam, where affordability affects educational decisions. Employment opportunities are particularly relevant due to the growing demand for Chinese-speaking workers in trade, tourism, and Chinese-invested enterprises. Gender differences were included because family responsibilities and financial pressures may influence participation in learning. Therefore, these variables provide an appropriate framework for examining the demand for learning Chinese in Vietnam. They are designed to ensure clarity, ease of understanding, and suitability for the target respondents. All observed variables are measured using a five-point Likert scale.

The scale ranges from 1, strongly disagree, to 5, strongly agree. Table 1 presents the research factors, variable codes, and the content of observed variables used in the questionnaire.

Table 1. Measurement scales for factors affecting the demand for learning Chinese and observed variables in the study

Factor	Code	Observed Variables
Learning Attitude	TD1	I feel interested and motivated when participating in Chinese language learning activities (listening, speaking, reading, writing).
	TD2	I perceive that learning Chinese is necessary and brings many benefits for my future.
	TD3	I am willing to spend time and effort to improve my Chinese proficiency.
Perceived Flexibility	LH1	I believe that learning Chinese can be flexible in terms of time (learning anytime suitable).
	LH2	I find that there are various forms of learning Chinese (online, offline, self-study).
	LH3	I can easily arrange Chinese learning to fit my personal schedule.
Supporting Tools and Technology	CN1	I can easily access applications, websites, or platforms that support Chinese learning.
	CN2	Technologies such as language learning apps, AI, or electronic dictionaries help me learn more effectively.
	CN3	The use of technology makes learning Chinese more convenient and enjoyable.
Information Technology Skills	KN1	I have a computer or smartphone to support my Chinese learning.
	KN2	I am confident in searching, selecting, and using Chinese learning materials on the Internet.
	KN3	I can proficiently use applications or software for learning Chinese.
Trust in Training Quality	CL1	I believe that Chinese courses provide high-quality instructional content.
	CL2	I trust the professional expertise and teaching methods of Chinese language instructors.
	CL3	I think that Chinese training programs are designed to meet learners' needs.
	CL4	I believe that participating in a Chinese course will help me achieve expected outcomes.
Learning Cost	CP1	I think the tuition fee for Chinese courses is appropriate for my financial capacity.
	CP2	Learning costs (tuition, materials, exam fees) influence my decision to study Chinese.
	CP3	I carefully consider expenses before deciding to learn Chinese.
	CP4	I am willing to pay if the training quality is commensurate.
Employment Opportunities	VL1	Knowing Chinese provides me with more job opportunities.
	VL2	Chinese is a competitive advantage when seeking employment.
	VL3	The demand for Chinese-speaking workforce is increasing.
	VL4	Learning Chinese helps me achieve higher income opportunities.
Training Support	HT1	I receive timely support from instructors when encountering difficulties.
	HT2	The institution/school provides sufficient learning materials.
	HT3	I can easily receive guidance or answers when facing problems.
	HT4	Support services help me learn more effectively.
Gender Differences	GT1	Gender affects family responsibilities while studying.
	GT2	Gender affects financial pressure when studying.
	GT3	My gender provides more favorable conditions for participating in learning.
Training Program	DT1	Rich and high-quality course materials are very important.
	DT2	I believe that online teaching methods via the Internet are highly effective for distance learning.
	DT3	The distance education institution develops programs that are aligned with my learning needs.
Learning Demand	YD1	When financial conditions are suitable, I will enroll in a Chinese course.
	YD2	When job requirements are appropriate, I will enroll in a Chinese course.
	YD3	I believe that I will participate in a Chinese course in the near future.
	YD4	I believe that I will successfully complete the Chinese course I am taking.
	YD5	I will recommend Chinese learning to others.
	YD6	I will continue to take another Chinese course if conditions permit.

2.3. Data analysis methods.

In this study, all measurement scales were designed using a five-point Likert format. The scale ranged from 1 (strongly disagree) to 5 (strongly agree). The data analysis procedure was conducted in sequential steps to ensure the reliability and validity of the scales, as well as the

overall fit of the research model. First, the reliability of the scales was assessed using Cronbach's Alpha. This step removed inappropriate observed variables. Next, Exploratory Factor Analysis was applied to identify the structure of latent factors and to evaluate the convergence of observed variables. After EFA, Confirmatory Factor Analysis was conducted to test the fit of the measurement model. This included evaluation of overall model fit, composite reliability, and convergent and discriminant validity. Finally, Structural Equation Modeling was used to test the research hypotheses and to assess the effects of the factors on the demand for learning Chinese.

2.4. Data collection methods.

Data for the study were collected through a structured questionnaire survey. The survey was administered through direct interviews and questionnaire distribution to respondents in the North Central region of Vietnam. The study applied convenience sampling. This method allowed easy access to respondents, supported rapid data collection, and reduced cost and time. It also ensured a sufficient sample size for quantitative analysis. However, because respondents were selected based on accessibility rather than random sampling, this approach may have introduced selection bias, with certain groups potentially being overrepresented, which may limit the generalizability of the findings to the broader population of North Central Vietnam. Regarding sample size requirements, Joseph F. Hair Jr. and colleagues (1998) recommended that when using EFA, the ratio of observations to measurement variables should be at least 5 to 1. Each observed variable should have a minimum of five responses [24]. In addition, to ensure reliability in Structural Equation Modeling, a sample size from 100 to 200 observations was considered adequate [25]. In practice, the study collected 489 valid responses. This exceeds the minimum requirement and supported the reliability and representativeness of the data for subsequent analyses.

3. Results and Discussion

3.1. Reliability testing of measurement scales.

The results of reliability testing using Cronbach's Alpha indicate that several observed variables were removed due to not meeting the required criteria (Table 2). These variables include TD3, KN2, CL1, CL2, CL3, CL4, CP1, CP2, CP3, CP4, HT1, HT2, HT3, HT4, GT3, DT1, DT2, and DT3. They were excluded because their item–total correlation coefficients were lower than 0.3. After this step, 16 observed variables remained and met the criteria for further analysis. The overall Cronbach's Alpha coefficient reached 0.867, which is higher than the acceptable threshold of 0.6. This result indicates that the scale has good reliability and strong internal consistency. In addition, all remaining observed variables have item–total correlation coefficients greater than 0.3, ranging from 0.315 to 0.618. This shows that the variables are closely related to the overall scale and adequately represent the research constructs. Specifically, the groups of variables related to learning attitude, learning flexibility, supporting technology, skills and learning conditions, employment opportunities, and gender factors all demonstrate acceptable reliability. Furthermore, the scale measuring learning demand, which includes three observed variables YD1, YD2, and YD3, has Cronbach's Alpha values ranging from 0.649 to 0.732. These values exceed the acceptable threshold. Overall, the results confirm that the remaining scales are reliable and suitable for subsequent EFA in the next step.

Table 2. Results of reliability testing for measurement scales.

Variable	Item-total correlation	Cronbach's alpha if item deleted
TD1	0.438	0.861
TD2	0.562	0.855
LH1	0.571	0.854
LH2	0.603	0.853
LH3	0.497	0.858
CN1	0.556	0.856
CN2	0.582	0.854
CN3	0.618	0.853
KN1	0.506	0.858
KN3	0.593	0.854
VL1	0.601	0.853
VL2	0.598	0.853
VL3	0.594	0.854
VL4	0.467	0.860
GT1	0.315	0.800
GT2	0.378	0.861
YD1	—	0.732
YD2	—	0.715
YD3	—	0.649

3.2. Reliability assessment through exploratory factor analysis.

The results of reliability assessment using EFA showed that the required conditions were satisfied for further analysis. The KMO value was 0.855, which fell within the acceptable range of 0.5 to 1. This indicated that the data were suitable for factor analysis (Table 3). In addition, Bartlett's test was statistically significant (Sig. < 0.05). The EFA results after the first rotation showed that four new factors were extracted. The total variance explained reached 56.08%. This means that these four factors accounted for 56.08% of the variation in the research data. The factor structure showed notable differences compared with the initial model. Therefore, the factors were renamed to better reflect the empirical results.

Table 3. Results of exploratory factor analysis for factors affecting the learning demand.

Variable	F1	F2	F3	F4
CN3	0.798			
CN2	0.739			
LH1	0.731			
CN1	0.706			
KN3	0.662			
LH3	0.653			
LH2	0.641			
KN1	0.527			
VL3		0.838		
VL1		0.776		
VL4		0.759		
VL2		0.634		
GT2			0.872	
GT1			0.819	
TD1				0.912
TD2				0.683
YD1	—	—	—	—
YD2	—	—	—	—
YD3	—	—	—	—

Factor 1 consisted of the variables CN1, CN2, CN3, LH1, LH2, LH3, KN1, and KN3, with CN3 showing the highest factor loading. The variables KN1 and KN3 also partially reflected the relationship between information technology and learning demand. Regarding the perceived flexibility variables, these represented respondents' positive perceptions of the strengths of learning demand supported by various learning modes, in which information

technology played an important facilitating role. Therefore, this factor was labeled Information Technology (CNTT). Factor 2 consisted of four variables related to Employment Opportunities (CHVL), so this factor retained its original name. Similarly, Factors 3 and 4 were labeled Gender Differences (KBGD) and Learning Attitude (TDHT), respectively. The renaming of these factors ensured consistency with the empirical findings and supported the adjustment of the research model (Figure 3).

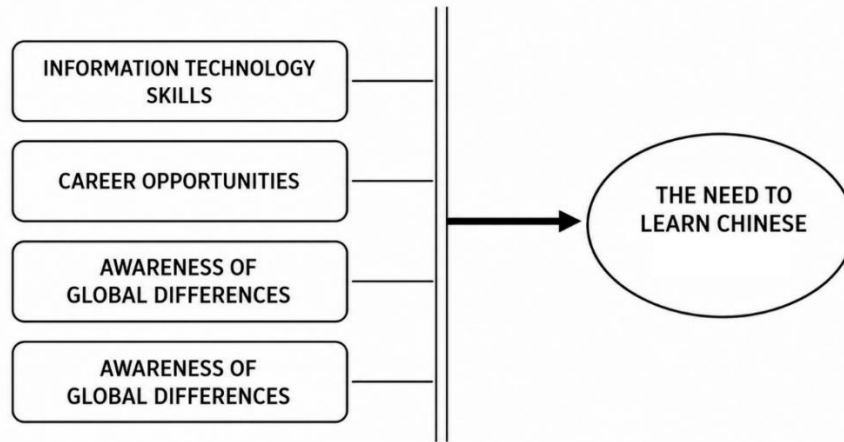


Figure 3. Revised research model.

3.3. Model fit assessment.

The results of Confirmatory Factor Analysis (CFA) for the research model, which included four groups of independent factors (Information Technology, Employment Opportunities, and Gender Differences) and the dependent factor (Learning Demand), indicated a good fit between the model and the data (Figure 4).

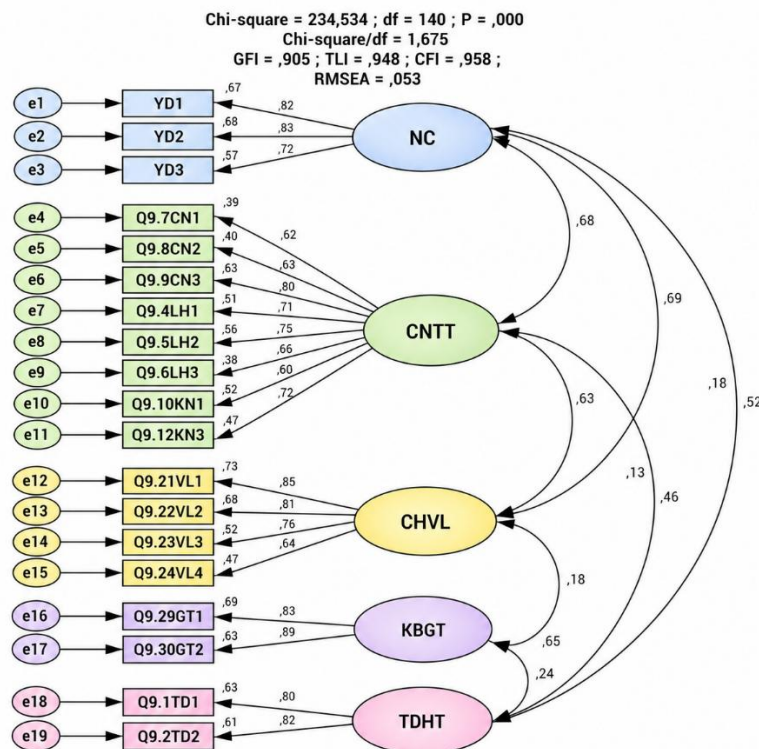


Figure 4. CFA results of the standardized measurement model.

The Chi-square divided by degrees of freedom was 1.675, and the test was statistically significant ($p = 0.000 \leq 0.05$). In addition, all model fit indices met the recommended thresholds. Specifically, GFI, TLI, and CFI were 0.905, 0.948, and 0.958, respectively, all exceeding 0.9, while RMSEA was 0.053, remaining below 0.08. These results confirmed that the model was consistent with the empirical data. All standardized factor loadings were greater than 0.5, and all unstandardized loadings were statistically significant ($p < 0.05$). This indicated that the observed variables adequately represented the latent constructs and supported convergent validity. Furthermore, correlations between factors were all below 1, and standard errors were less than 0.05, indicating satisfactory discriminant validity. However, the CFA results also revealed correlations among measurement errors in several scales, suggesting that the model did not fully achieve unidimensionality. Despite this limitation, the overall model still demonstrated a good fit and was considered suitable for further hypothesis testing using SEM.

3.4. Identification of factors affecting the demand for learning Chinese through SEM.

To identify the factors affecting learning demand (NC), the study used SEM to test the relationships among latent variables in the research model (Figure 5). At the same time, the Bootstrap method was applied to estimate parameters and evaluate the reliability of the estimates, thereby enhancing the stability of the model.

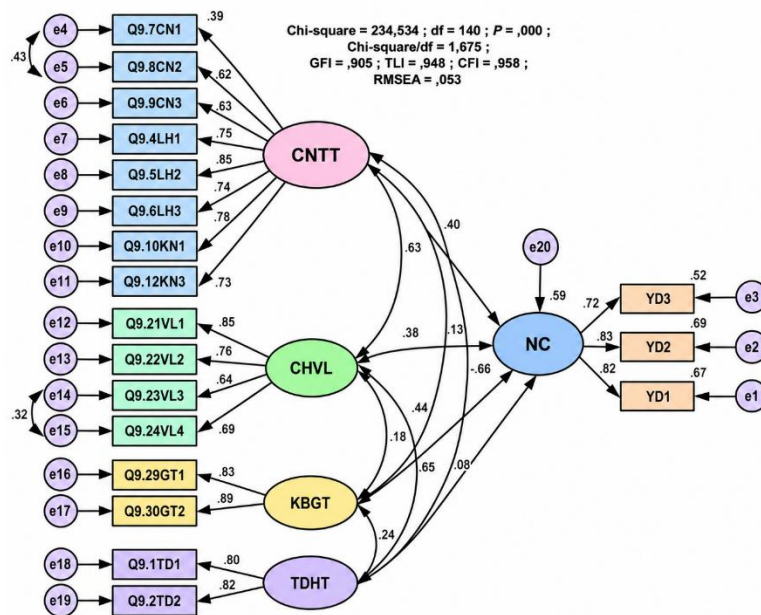


Figure 5. Results of the First SEM model of factors affecting the demand for learning Chinese.

The results showed that the relationships among the factors were statistically significant ($p\text{-value} = 0.000 < 0.05$). The remaining correlations between Gender Differences and other factors were low but still statistically significant. At the same time, the model also recorded correlations between measurement errors, with e5 and e4 equal to 0.439, and e1 and e14 equal to 0.337, indicating internal relationships among some observed variables (Table 4). The statistically significant correlation coefficients and their theoretical consistency provide an important basis for confirming that the research model can effectively explain the factors affecting the demand for learning Chinese. Therefore, the SEM results show that Employment

Opportunities, Information Technology, and Learning Attitude are the most influential factors affecting the demand for learning Chinese, while Gender Differences also have an effect, but at a lower level.

Table 4. Results of discriminant validity testing among groups

Relationship	Correlation (r)	S.E.	C.R.	p-value
CNTT ↔ NC	0.671	0.049	6.521	0.000
CHVL ↔ NC	0.702	0.046	6.742	0.000
KBGĐ ↔ NC	0.192	0.063	12.481	0.000
TDHT ↔ NC	0.533	0.055	8.721	0.000
CNTT ↔ CHVL	0.615	0.052	7.184	0.000
CNTT ↔ KBGĐ	0.148	0.064	13.205	0.000
CNTT ↔ TDHT	0.469	0.057	9.118	0.000
CHVL ↔ KBGĐ	0.176	0.063	12.514	0.000
CHVL ↔ TDHT	0.662	0.049	7.002	0.000
KBGĐ ↔ TDHT	0.241	0.062	11.842	0.000
e5 ↔ e4	0.439	0.058	9.563	0.000
e1 ↔ e14	0.337	0.061	10.705	0.000

The results of the first SEM analysis show that among the four groups of factors in the research model, only two factors had statistically significant linear relationships with the demand for learning Chinese. Specifically, the factors KBGĐ and TDHT had p-values greater than 0.05, so they did not reach statistical significance and were removed from the research model. Learning attitude is often considered an important factor in behavioral theory. However, in this research context, TDHT was not strong enough to directly influence learners' intention to participate in Chinese language courses. This finding may be explained by the fact that the decision to learn Chinese is not based solely on individual perceptions or attitudes. Practical factors such as technological conditions, cost, and employment opportunities appear to play a more important role. For many learners, the primary motivation for studying Chinese is to meet recruitment requirements or improve career prospects rather than personal interest in the language itself. As a result, even individuals who do not particularly enjoy learning Chinese may still choose to enroll in language courses because of perceived economic or professional benefits.

For the factor KBGĐ, the lack of statistical significance may reflect the increasing trend of gender equality in access to education. In the current context, opportunities to learn Chinese appear to be relatively equally distributed across gender groups. Therefore, this factor no longer plays an important role in explaining learning demand. To improve the accuracy of the research model in reflecting the relationships among factors, the authors conducted a second SEM analysis after removing the two non-significant factors. The revised model included 12 observed variables across two main factor groups. The results of the second SEM analysis are presented in Table 5.

Table 5. Results of estimation of relationships in the SEM model, First analysis

Relationship	Estimate	S.E.	C.R.	p-value	Hypothesis
NC ← CNTT	0.472	0.102	4.714	0.000	H1
NC ← CHVL	0.451	0.128	3.559	0.000	H2
NC ← KBGĐ	0.044	0.040	1.10	0.271	H3
NC ← TDHT	0.089	0.083	1.07	0.284	H4

The results of the second estimation showed that the factors CNTT and CHVL were statistically significant, as all p-values were below the 5% significance level (Table 6). In general, the unstandardized estimates were all positive, which indicated that both factor groups

had a positive effect on NC among the surveyed participants. This suggested that when these influencing factors were better satisfied, the demand for learning Chinese among people in the North Central region increased.

Table 6. Results of estimation of relationships in the SEM model, second analysis.

Relationship	Estimate	S.E.	C.R.	p-value	Hypothesis
NC ← CNTT	0.486	0.103	4.128	0.000	H1
NC ← CHVL	0.537	0.109	4.002	0.000	H2

The results of the second SEM analysis, after removing the two non-significant factors KBGD and TDHT, showed that the research model achieved a good level of fit with the empirical data. Specifically, the model had 85 degrees of freedom, with Chi-square = 144.526 and p-value = 0.000. The Chi-square-to-degrees-of-freedom ratio was 1.700, which is less than 2. The model fit indices included GFI = 0.922, TLI = 0.959, and CFI = 0.967, all of which were greater than 0.9, while RMSEA = 0.054 was lower than 0.08. Overall, all standardized estimates in the second SEM model were positive, indicating that the remaining factors in the model had a positive effect on the demand for learning Chinese (Figure 6).

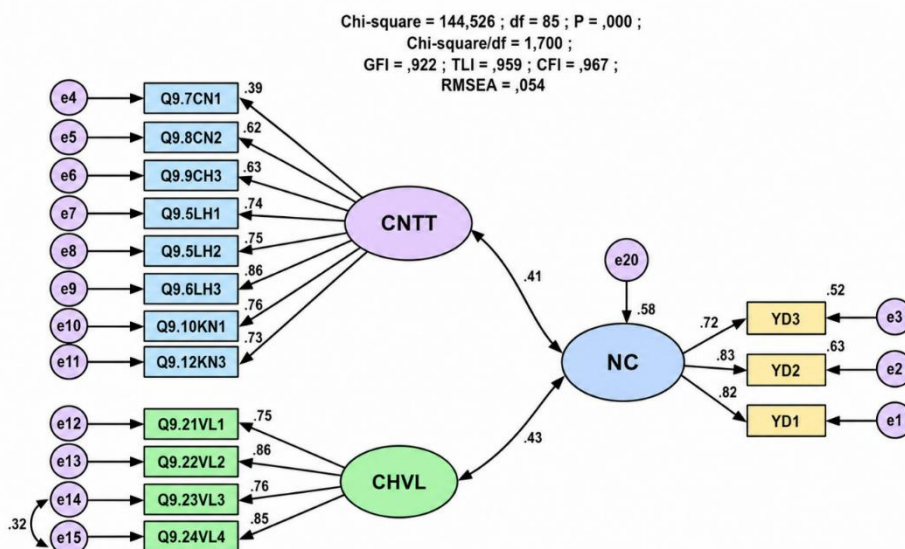


Figure 6. Results of the Second SEM model of factors affecting the demand for learning Chinese.

Among these factors, CHVL was identified as the most influential factor. This finding shows that when learners clearly perceive that studying Chinese can expand employment opportunities, increase income, or support career advancement, their motivation to participate in Chinese courses becomes stronger. This reflects a practical trend in which learners increasingly focus on the outcomes of training programs. In addition, CNTT also has a positive and significant effect on the demand for learning Chinese. In the context of digital transformation and rapid technological development, distance learning has become more convenient due to diverse learning resources, flexible access, and fast interaction between instructors and learners. For Chinese language learning, information technology plays an important role in supporting pronunciation practice, communication, vocabulary search, and access to extensive learning materials. Therefore, educational institutions should invest in and effectively utilize technological platforms to enhance learning flexibility, provide convenient conditions in terms of time and location, and ensure teaching quality and training effectiveness.

The results of reliability testing using the Bootstrap method with $N = 500$ resamples indicated that the SEM model estimates were stable and reliable (Table 7). Bootstrap analysis was conducted to assess estimation bias by comparing the original estimates with the mean values obtained from the resamples. The Bias values for all parameters were very small, ranging from -0.008 to 0.005 , indicating negligible differences between the original and Bootstrap estimates. In addition, the absolute CR values ranged from 0.83 to 1.67 , all below the threshold of 2 , suggesting that the estimation bias was not statistically significant.

Table 7. Bootstrap estimation results with $n = 500$

Parameter	SE	SE-SE	Mean	Bias	SE-Bias	CR
NC ← CNTT	0,132	0,004	0,421	0,005	0,006	0,83
NC ← CHVL	0,118	0,004	0,427	-0,008	0,005	-1,60
KN3 ← CNTT	0,056	0,002	0,725	0,001	0,002	0,50
KN1 ← CNTT	0,069	0,002	0,594	-0,001	0,003	-0,33
LH3 ← CNTT	0,064	0,002	0,658	-0,003	0,003	-1,00
LH2 ← CNTT	0,057	0,002	0,748	-0,003	0,002	-1,50
LH1 ← CNTT	0,067	0,002	0,736	-0,005	0,003	-1,67
CN3 ← CNTT	0,047	0,001	0,804	-0,002	0,002	-1,00
CN2 ← CNTT	0,076	0,002	0,633	-0,002	0,003	-0,67
CN1 ← CNTT	0,073	0,002	0,626	-0,003	0,003	-1,00
VL4 ← CHVL	0,063	0,002	0,652	-0,001	0,003	-0,33
VL3 ← CHVL	0,052	0,002	0,759	-0,003	0,002	-1,50
VL2 ← CHVL	0,049	0,001	0,796	-0,002	0,002	-1,00
VL1 ← CHVL	0,037	0,001	0,865	-0,002	0,002	-1,00
YD3 ← NC	0,057	0,002	0,724	-0,002	0,002	-1,00
YD2 ← NC	0,052	0,002	0,832	-0,001	0,002	-0,50
YD1 ← NC	0,050	0,002	0,817	-0,002	0,002	-1,00

For the relationship between NC and CNTT, the Bootstrap mean was 0.421 , with a Bias of 0.005 and CR of 0.83 , indicating high stability. Similarly, the relationship between NC and CHVL showed a Bootstrap mean of 0.427 , a Bias of -0.008 , and CR of -1.60 , which also remained within the acceptable range. The observed variables for the CNTT construct demonstrated stable standardized loadings. CN3 had the highest loading (0.804), followed by LH2 (0.748) and LH1 (0.736), indicating strong representation of the construct. Similarly, for CHVL, VL1 showed the highest loading (0.865), followed by VL2 (0.796) and VL3 (0.759), confirming the strong contribution of employment-related expectations. For the dependent variable NC, the observed variables YD1, YD2, and YD3 also showed high loadings, ranging from 0.724 to 0.832 , indicating strong construct representation. Overall, the Bootstrap results confirmed that the SEM model estimates were reliable, with minimal and statistically insignificant bias, further supporting the stability of the research model.

4. Conclusions

The study identified the factors that influenced learning demand for Chinese in the North Central region of Vietnam. The results showed that CHVL and CNTT were two factors with positive and statistically significant effects, with CHVL playing the most important role. This finding reflects a trend in which learners increasingly focus on practical benefits and the potential to improve employment opportunities when choosing to study a foreign language. In contrast, TDHT and KBGD were not statistically significant, which suggests that the decision to learn Chinese is influenced more by practical conditions than by individual factors. Based on these findings, educational institutions should align training programs with labor market demands and strengthen the application of technology in teaching to improve training effectiveness. In addition, the study had limitations in terms of scope and sampling method, so

future research should expand the target population and include additional factors to improve the generalizability of the results.

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Author Contribution

Nguyen Ngoc Anh: Conceptualization; Methodology; Data Collection; Data Analysis; Writing; Bui Thi Van Nga: Data Analysis; Writing.

Competing Interest

The authors declare no competing interest.

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