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Exploring UTAUT2 factors affecting the acceptance of the Chaoxing network teaching platform by higher vocational students

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Abstract: This study explores the factors influencing vocational students' acceptance of the Chaoxing Network Teaching Platform (CNTP) in the post-pandemic era, with a focus on technology acceptance. A quantitative approach was employed, utilizing surveys, factor analysis, t-tests, ANOVA, regression analysis, and structural equation modeling (SEM) to examine the relationships between technology acceptance factors and self-regulated learning (SRL) among vocational students. The results indicate that Performance Expectancy (PE), Effort Expectancy (EE), Hedonic Motivation (HM), and Habit (HB) significantly impact students' acceptance of CNTP. These findings highlight the importance of technology acceptance in fostering effective SRL in online learning environments. This study enriches the literature by identifying key determinants of online platform acceptance in vocational education, emphasizing the role of technology acceptance in supporting students' SRL and digital learning success. This study highlights key factors influencing vocational students' acceptance of the Chaoxing Network Teaching Platform (CNTP) and its role in the digital transformation of vocational education. Based on the findings, online learning platforms should enhance user experience through better design, usability, and engagement. Vocational education can implement training programs to foster self-regulated learning habits and long-term platform use. Policymakers should incorporate technology acceptance factors into strategies that support the effective and sustainable integration of online learning in vocational education.

Keywords: *Chaoxing Network Teaching Platform, Technology Acceptance, Unified theory of acceptance and use of technology 2, Vocational education, Online learning.*

1. Introduction

The fast advancement of technologies such as the Internet of Things (IoT), blockchain, cloud computing, and artificial intelligence is transforming various aspects of daily life, including how people learn and work. Online education, powered by the Internet, has become a central form of learning for university students and is anticipated to be key in supporting lifelong learning. From an individual perspective, focusing on personal growth, and a broader societal perspective, focusing on national progress, there is a growing need to nurture modern digital citizens capable of navigating online education resources and the digital world effectively. The rapid evolution of online education has positioned self-regulated learning (SRL) as a critical determinant of learner success, particularly within massive open online courses (MOOCs) and artificial intelligence (AI) enhanced platforms [1].

To improve the online learning experiences of university students, ensuring the quality of the online learning environment is essential, especially concerning the Network Teaching Platform (NTP). The effectiveness of online learning is closely tied to the platform's quality, which is critical for the success of students' educational journeys. A high-quality NTP should possess several key characteristics:

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i) Comprehensive Teaching Resources: The platform must offer a variety of educational materials, such as course videos, documents, and assessments, to address diverse learning needs.

ii) Well-Structured Teaching Framework: The platform should be designed with students' learning styles and cognitive processes, helping them acquire knowledge effectively.

iii) Interactive Features: Tools for communication and interaction, such as discussion forums and Q&A sections, are vital for promoting student-instructor engagement.

iv) Reliable Technical Support: The platform needs to be technically stable, minimizing disruptions during learning.

v) Security and Privacy: Protecting students' data and ensuring a secure learning environment are paramount.

Therefore, selecting a high-quality online platform is crucial to the success of online learning. An, et al. [2]suggested that students' perceived acceptance of technology can help them improve their ability to engage in self-regulated learning by enhancing intrinsic motivation and increasing learning engagement.

Online learning uses digital technologies to support and enhance learning, incorporating various online educational resources and tools. A Global Framework for New Media Literacy has been developed based on studies by organizations like the European Union and UNESCO. This framework identifies seven key domains of literacy and 26 specific indicators, focusing on aspects such as platform usage and technology acceptance. A key component of successful online learning is the ability of students to engage in self-regulated learning, allowing them to independently explore, problem-solve, and develop by utilizing the vast resources available on the Internet. Navarro, et al. [3] highlight the need to enhance self-efficacy and self-regulation to boost technology acceptance, improving students' academic performance and perceived learning in virtual environments. The quality of the Network Teaching Platform plays a significant role in facilitating effective self-regulated learning.

This study explores the factors influencing the use of the Chaoxing Network Teaching Platform (CNTP) in Chinese higher vocational colleges, focusing on how these factors affect students' learning outcomes. The findings are expected to provide insights into the relationship between platform quality and the effectiveness of online education.

2. Research Design

2.1. Research Participants

This study conducted an online survey targeting students from higher vocational colleges and universities in Guizhou Province, China, all of whom had prior experience with the CNTP. A total of 161 valid and completed responses were received, with an effective response rate close to 100%.

2.2. Research Tools

This study aims to investigate student engagement and technology acceptance on the Chaoxing Network Teaching Platform (CNTP) by integrating two prominent models: Venkatesh, et al. [4] Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) and DeLone and McLean [5] updated Information Systems Success Model (ISSM). The study focused on four key factors from the UTAUT2 model—PE, EE, HM, and HB—to assess user acceptance and technology adoption (see Table1). In addition, the research incorporated the System Quality and Information Quality dimensions from the ISSM framework to evaluate the platform's effectiveness in terms of reliability, usability, and content quality. By combining these models, this study seeks to provide a comprehensive analysis of how students interact with the CNTP and what factors drive their adoption of this online learning platform.

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Table 1.
Technology Acceptance Scale for Students' Use of CNTP.

Latent Variables	Indicator Codes	Measurement Question Items
Performance Expectancy	PE1	The use of a CNTP is conducive to improving the effectiveness of learning.
	PE 2	The CNTP can improve my ability to perform in the learning process.
	PE 3	I think the CNTP is helpful to my learning.
	PE 4	Using a CNTP can improve my learning effectiveness.
Effort Expectancy	EE1	Becoming proficient in using the CNTP is easy for me.
	EE 2	Learning to operate the CNTP is easy for me.
	EE 3	I think it is easy to do what I want to do by operating the CNTP.
	EE 4	I think the CNTP is easy to use.
Hedonic Motivation	HM1	Do you find the CNTP interesting?
	HM2	Do you think the use of the CNTP in teaching enhances students' interest in learning?
	HM3	Do you feel happy using the CNTP?
Habit	HB1	I often log on to the CNTP for course learning.
	HB2	I often use the CNTP to submit my assignments.
	HB3	I often use the CNTP to contact my teacher.
	HB4	I often use the CNTP to discuss assignments.

In this study, based on the frameworks of Arbaugh [6] and Venkatesh, et al. [4] a set of 15 survey items was created to evaluate students' usage of the Chaoxing Network Teaching Platform (CNTP). The survey items were designed according to the actual features of the CNTP system and used a five-point Likert scale (1 = Strongly Disagree, 5 = Strongly Agree). The scale focuses on four key factors: PE, EE, HM, and HB, as shown in Table 1.

To ensure the reliability of the survey instrument, the study targeted students from a leading vocational college in southwestern China who had prior experience using the CNTP. An exploratory factor analysis (EFA) yielded a Kaiser-Meyer-Olkin (KMO) value of 0.823, which exceeds the recommended threshold of 0.700. Bartlett's test of sphericity was significant ($\chi^2 = 1334.713$, df = 171, $p < 0.001$), confirming that the data were appropriate for factor analysis. Principal component analysis (PCA) with varimax rotation identified six factors with eigenvalues greater than 1. Items with low factor loadings (below 0.400), such as S2, and those with cross-loadings (where the difference between two loadings was less than 0.350), such as C3, were excluded. After refining the item set, a second round of factor extraction revealed six factors, with loadings ranging from 0.607 to 0.849, explaining a total variance of 66.772% (see Figure 1).

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.936
Bartlett's Test of Sphericity	Approx. Chi-Square	13770.050
	df	1326
	Sig.	<.001

Figure 1.
Students' technology acceptance Exploratory factor analysis.

In this study, the scale's reliability was assessed, with the overall reliability coefficient being 0.936, which is well above the 0.90 threshold, indicating excellent reliability. The Kaiser-Meyer-Olkin (KMO) measure, used to assess the adequacy of the sample for factor analysis, was also evaluated. A higher

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KMO value, closer to 1, suggests stronger inter-correlations among the variables and confirms the appropriateness of the data for factor analysis [7]. Furthermore, Bartlett's Test of Sphericity tested the scale's validity. The significant result ($p < 0.05$), with values as low as 0.001, indicates that the scale demonstrates strong validity.

2.3. Data Analysis

This study employs a combination of questionnaire surveys, regression analysis, independent samples t-tests, and one-way ANOVA to examine the factors influencing students' acceptance of the CNTP. Initially, descriptive statistics were used to analyze the survey data, followed by Pearson's correlation analysis to explore the relationships between variables. Regression analysis was then conducted to identify potential causal relationships. Lastly, independent samples t-tests and one-way ANOVA were used to determine if significant differences existed in the scores for the six factors related to social media addiction, considering variables such as gender, age, personality, academic level, and year of study.

3. Findings and Analyses

3.1. Exploratory Factor Analysis Results

In this study, SPSS 29.0 software was used to conduct an exploratory factor analysis on the acceptance scale. Principal component analysis (PCA) was performed with a threshold of eigenvalue greater than 1, and the factor loading matrix was rotated using the varimax method. Items were selected based on the criterion that factor loadings below 0.5 were excluded. As a result, 15 items with factor loadings above 0.5 were retained (see Table 2). The exploratory factor analysis results showed that the cumulative variance explained by the common factors was 82.653%, which exceeds the 80% threshold. This indicates that the extracted factors strongly represent the original variables and effectively account for the variance, ensuring high overall validity.

Table 2.
Explanation of the total variance of the technology acceptance scale of CNTP.

	Initial eigenvalue			**Extract the sum of the squares of the loads**			**Rotational load sum of squares**		
Component	**Total**	**Percentage of variance**	**Cumulative %**	**Total**	**Percentage of variance**	**Cumulative %**	**Total**	**Percentage of variance**	**Cumulative %**
1	11.300	75.330	75.330	11.300	75.330	75.330	6.665	11.300	75.330
2	1.098	7.323	82.653	1.098	7.323	82.653	5.733	1.098	7.323
3	.611	4.074	86.727						
4	.469	3.126	89.853						
5	.266	1.774	91.627						
6	.248	1.655	93.282						
7	.215	1.432	94.714						
8	.185	1.235	95.949						
9	.146	.975	96.925						
10	.119	.794	97.719						
11	.100	.667	98.385						
12	.085	.566	98.952						
13	.073	.488	99.440						
14	.050	.335	99.774						
15	.034	.226	100.000						

Note: Extraction method: principal component analysis

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3.2. Confirmatory Factor Analysis Results

In this study, a structural equation model was developed using AMOS 29.0, drawing on the UTAUT2 model theory in conjunction with the CNTP. The model hypothesized that four variables—PE, EE, HM, and HB—would influence students' use of the platform (see Figure 2).

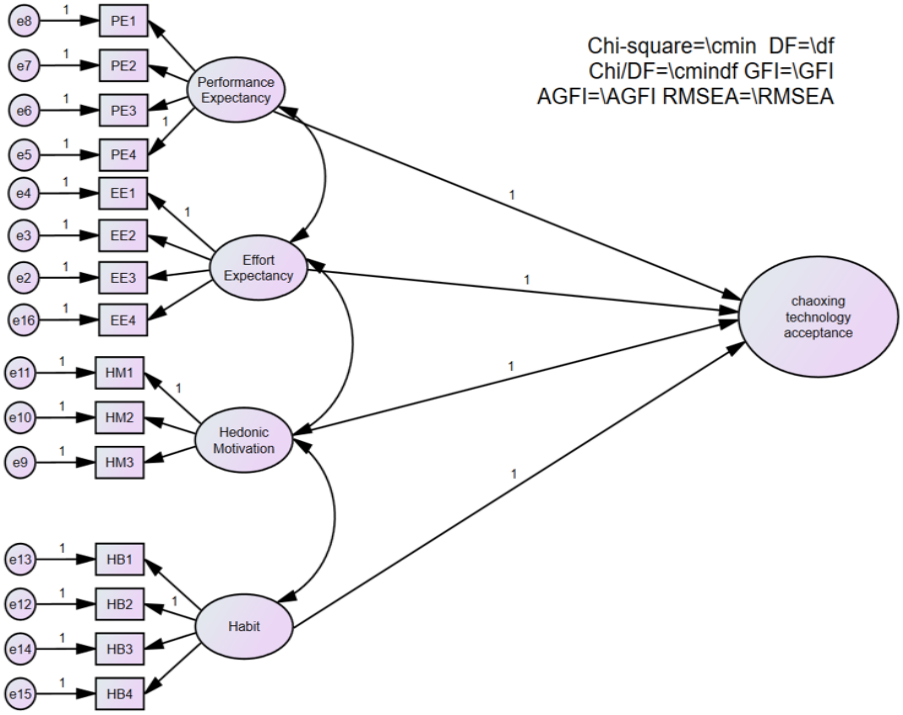

Figure 2.
Theoretical model.

Based on the recommendations of Hair, et al. [8] and other relevant expert authors, the article refers to well-known model fitting indicators, as shown below Table 3, to identify whether it proposes an impact factor measurement model that meets the actual situation.

Table 3.
Indicators of model fit

Indicator	Model Indicator Value	Standard	Conclusion	Criteria Source
CMIN	432.199	The smaller, the better.		
DF	239	The smaller, the better.		Hair, et al. [8]
CMIN/DF	1.808	<3 excellence <5 Acceptable	Good Fit	Godbout, et al. [9]
GFI	0.856	>0.8 Acceptable;>0.9 good fit	Acceptable	Gotlieb, et al. [10]
AGFI	0.820	>0.8 Acceptable;>0.9 good fit	Acceptable	Scott and Bruce [11]
CFI	0.938	>0.9	Good Fit	Gotlieb, et al. [10]
TLI(NNF)	0.928	>0.9	Good Fit	
RMSEA	0.063	<0.08 excellence <0.1 Acceptable	Good Fit	Gotlieb, et al. [10]

The online questionnaire data was imported into AMOS 29.0 software to test the model, resulting in a measurement model that included four latent variables: PE, EE, HM, and HB. Initially, there were four observed variables for PE, four for EE, three for HM, and four for HB, totaling 15 items. Upon model testing, some items were found to be overly repetitive, leading to the removal of four observed variables, leaving 11 items (see Figure 3).

The model fit indices showed promising results: CMIN = 79.255, DF = 38, with a CMIN/DF ratio of 2.056, below the acceptable threshold of 3, indicating an excellent fit. Other indices such as GFI = 0.922 (good fit), AGFI = 0.865 (acceptable), RMSEA = 0.082 (acceptable and close to excellent), and CFI = 0.974 (good fit) further confirmed the model's suitability. After removing irrelevant observed variables, the final model showed a firm fit, indicating that the four latent variables effectively measure students' acceptance of the CNTP. This suggests that the platform significantly impacts improving students' online learning effectiveness and quality.

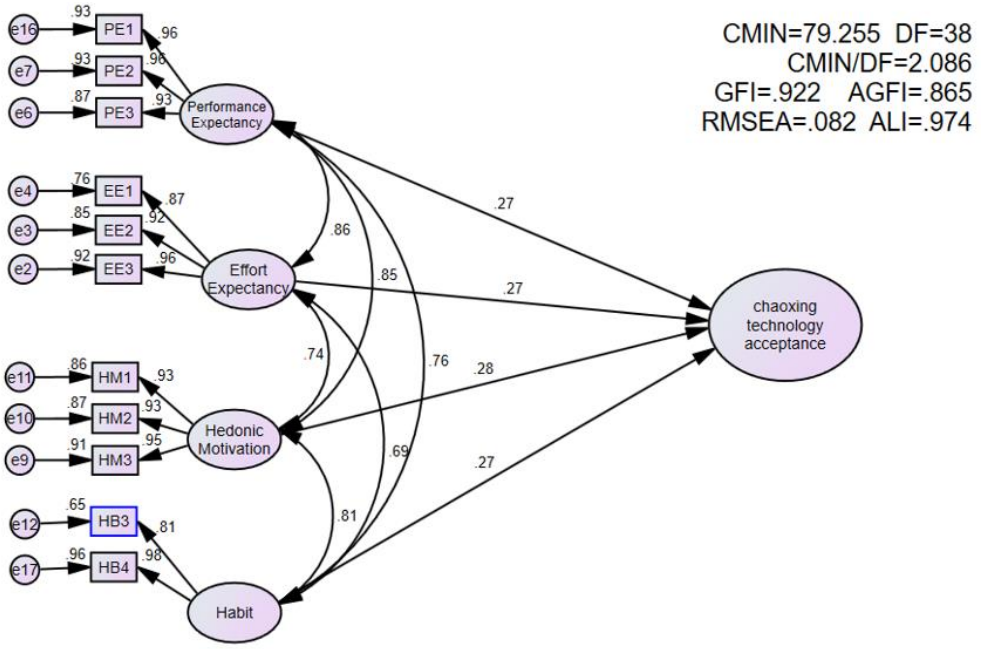

Figure 3.
Structural Equation Modelling of Student Acceptance of the CNTP.

Table 4.
Aggregation validity.

	Trails		Standardized Factor Loadings	S.E.	P	CR.	AVE
EE1	<---	EE	0.901			0.9532	0.836
EE2	<---	EE	0.912	0.056	***		
EE3	<---	EE	0.931	0.052	***		
EE4	<---	EE	0.913	0.053	***		
PE1	<---	PE	0.95	0.036	***	0.9732	0.9006
PE2	<---	PE	0.956	0.035	***		
PE3	<---	PE	0.946	0.037	***		
PE4	<---	PE	0.944				
HM1	<---	HM	0.931			0.8818	0.8818
HM2	<---	HM	0.935	0.043	***		
HM3	<---	HM	0.951	0.043	***		
HB1	<---	HB	0.93	0.07	***	0.9123	0.7232
HB2	<---	HB	0.824				
HB3	<---	HB	0.766	0.093	***		
HB4	<---	HB	0.873	0.081	***		

Kline [12] recommended that an Average Variance Extracted (AVE) value greater than 0.5 is considered ideal. In this study, all AVE values exceeded 0.5, the standardized factor loadings were above

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0.5, and the Composite Reliability (CR) exceeded 0.7, demonstrating the strong reliability and validity of the model. Additionally, in line with Fornell and Larcker [13] criteria, the square root of the AVE for each latent variable was more significant than the correlation coefficients between latent variables, indicating satisfactory discriminant validity. This suggests that the dimensions are sufficiently distinct from one another. The results presented in Table 4 confirm that the scale possesses excellent reliability and validity. Therefore, this validated scale was used for a large-scale online survey of students who have experience with the CNTP.

Table 5.
Discriminant validity.

	Habit	Hedonic Motivation	Performance Expectancy	Effort Expectancy
HB	0.494			
HM	0.496	0.603		
PE	0.000**	0.000**	0.641	
EE	0.000**	-0.011**	0.561	0.611
AVE	0.723	0.8818	0.9006	0.836

Note: *b indicate<0.05, **indicate<0.01

Discriminant validity was evaluated by comparing the square root of the AVE with the correlation coefficients between the factors (see Table 5). Since the square root of the AVE for each factor was more significant than the correlation values between the factors, this confirms strong discriminant validity.

3.3. Descriptive Statistics Results

The 161 valid data collected in this study were analyzed with descriptive statistics, which showed that the standard deviation was between 2.364 to 3.208 and the variance ranged from 5.589 to10.292, indicating that the question items were less discrete and more stable. The mean values of the variables were in the order of PE (16.1304) > EE (15.8820) > HB (15.8696) > HM (11.8696) (see below Table 6), with Performance Expectancy scoring the highest and Hedonic Motivation scoring the lowest.

Table 6.
Descriptive statistics.

	N	Minimum	Maximum	Mean	Std. Deviation	Variance
PE	161	4.00	20.00	16.1304	3.09259	9.564
EE	161	4.00	20.00	15.8820	3.20815	10.292
HM	161	3.00	15.00	11.8696	2.36413	5.589
HB	161	6.00	20.00	15.8696	3.11073	9.677
Valid N (listwise)	161					

The mean score for the Performance Expectancy dimension was 16.1304, the highest among all the dimensions. This indicates that many university students believe that using the CNTP contributes positively to enhancing their learning effectiveness. This suggests that the platform is perceived to have tangible benefits in improving learning outcomes.

The Effort Expectancy dimension had a mean score of 15.8820, reflecting that current students find the CNTP relatively easy to use. Most students reported being proficient with the platform, which they consider a valuable tool for learning, implying that the CNTP is user-friendly and accessible. The Habit dimension scored a mean of 15.8696, signaling that the CNTP has become widely adopted by students. A significant proportion (68.33%) reported regularly using the platform to communicate with their teachers, and over 80% indicated they frequently use it for assignment submissions.

This suggests that the CNTP has become integral to students' academic routines, reinforcing its role as a standard tool for course-related tasks. The Hedonic Motivation dimension's mean score was 11.8696, indicating that the platform is engaging and interesting. Over three-quarters of respondents

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affirmed that the CNTP aligns with their interests, and over 70% expressed that the platform met or exceeded their expectations for educational tools. These results show a positive correlation between the CNTP and students' motivation to engage in learning.

Finally, regarding emotional engagement, nearly half of the respondents (46.58%) reported that their mood was generally aligned with the process of using the CNTP, further supporting the idea that the platform positively influences students' emotional experience during learning.

In summary, the data suggests that the CNTP effectively enhances learning outcomes and engages students on a motivational and emotional level, fostering habitual and sustained use.

3.4. Correlation Analysis Results

In this study, Pearson correlation analysis was performed on the factors of the Technology Acceptance Scale for Students' Use of the CNTP using SPSS 29.0. The findings revealed that Performance Expectancy (PE), Effort Expectancy (EE), Hedonic Motivation (HM), and Habit (HB) all had p-values below 0.05, with Pearson correlation coefficients greater than 0 (see below Table 7). This suggests that these four factors are significantly and positively correlated.

Table 7.
Correlation analysis.

		PE	EE	HM	HB
PE	Pearson correlation	1	0.861**	0.817**	0.841**
	Significance (two-tailed)		<0.001	<0.001	<0.001
	Number of cases	161	161	161	161
EE	Pearson correlation	0.861**	1	0.709**	0.759**
	Significance (two-tailed)	<.001		<0.001	<0.001
	Number of cases	161	161	161	161
HM	Pearson correlation	0.817**	0.709**	1	0.831**
	Significance (two-tailed)	<0.001	<0.001		<0.001
	Number of cases	161	161	161	161
HB	Pearson correlation	0.841**	0.759**	0.831**	1
	Significance (two-tailed)	<0.001	<0.001	<0.001	
	Number of cases	161	161	161	161

Note: **. At the 0.01 level (two-tailed), the correlation is significant.

3.5. Regression Analysis Results

This study used regression analysis to explore the relationships between the factors affecting college students' use of the CNTP (see Table 8). In this analysis, the student's usage of the CNTP was considered the dependent variable, while Performance Expectation, Effort Expectation, Hedonic Motivation, and Habit were the independent variables.

Table 8.
Significance analysis of regression coefficients.

Model	Unstandardized coefficients			Standardized coefficients	Significance	Cointegration statistics		R^2	D-W
	B		Standard Error	Beta		Tolerance	VIF		
1	(Constant)	-3.553E-15	0.000		1.000			1.000	2.045
	PE	1.000	0.000	.284	<.001	.156	6.419		
	EE	1.000	0.000	.295	<.001	.254	3.933		
	HM	1.000	0.000	.217	<.001	.262	3.820		
	HB	1.000	0.000	.286	<.001	.227	4.414		

Source: Dependent variable: Chaoxing Technology Acceptance.

Regression analysis was conducted to explore the relationship between the independent variables and the technology acceptance of the Chaoxing Network Teaching Platform (CNTP). The tolerance and

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variance inflation factor (VIF) values were examined to assess multicollinearity. Generally, a VIF value below 10 and a tolerance above 0.1 indicate the absence of multicollinearity. The Durbin-Watson statistic (D-W) ranged from 1.5 to 2.5, indicating that the sample data points are independent. Additionally, the R^2 value ranged from 0.3 to 0.6, suggesting that the independent variables provide a moderate explanation of the variance in the dependent variable. Furthermore, the significance test showed an R^2 of 1.000, meaning that the independent variables account for 100% of the variance in the dependent variable. The coefficients for Performance Expectancy, Effort Expectancy, Hedonic Motivation, and Habit were all B = 1.000, with $p = 0.001 < 0.05$, indicating a strong and significant positive influence of these factors on the usage of the CNTP.

3.6. Independent Sample T-Test Results

The independent samples t-test was used in this study to investigate whether factors such as gender and region of the subjects significantly affect the scores on each factor of college students' use of CNTP.

3.6.1. Gender factors

In this study, an independent samples t-test was performed using SPSS 29.0 to investigate the factors influencing college students' use of the CNTP. The four factors were treated as the test variables, with gender (male: 32; female: 129) as the grouping variable. The results indicated no significant differences between male and female students on the four factors: Performance Expectancy, Effort Expectancy, Hedonic Motivation, and Habit.

3.6.2. Different regions

In this study, an independent samples t-test was conducted using SPSS 29.0 to analyze the factors influencing college students' use of the CNTP, with the region (urban: 24; rural: 137) as the grouping variable. The results showed no significant differences in the scores for the four factors—Performance Expectancy, Effort Expectancy, Hedonic Motivation, and Habit—between students from urban and rural areas (see Table 9) .

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Table 9.
Independent sample test.

		Levine's test of variance equivalence		Mean equivalence t-test							
		F	Significance	T	Degrees Of Freedom	Significance		Mean Difference	Standard Error Margin	Difference 95% Confidence Interval	
						Unilateral P	Bilateral P			Lower Limit	Upper Limit
PE	Assuming equal variance	0.026	.871	-.138	159	0.445	0.890	-.08479	.61263	-1.29474	1.12516
	Equal variance is not assumed.			-.129	43.889	0.449	0.898	-.08479	.65852	-1.41204	1.24247
EE	Assuming equal variance	0.011	.917	.109	159	0.457	0.913	.06928	.63554	-1.18591	1.32447
	Equal variance is not assumed.			.102	43.954	0.460	0.920	.06928	.68216	-1.30556	1.44412
HM	Assuming equal variance	0.000	.995	.348	159	0.364	0.729	.16279	.46818	-.76186	1.08744
	Equal variance is not assumed.			.309	41.963	0.379	0.759	.16279	.52700	-.90076	1.22635
HB	Assuming equal variance	0.163	.687	.011	159	0.496	0.991	.00678	.61626	-1.21034	1.22390
	Equal variance is not assumed.			.010	44.528	0.496	0.992	.00678	.65331	-1.30943	1.32300

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3.7. One-Way ANOVA Results

A one-way ANOVA was conducted in this study to assess whether factors such as age, grade level, and subject discipline significantly influenced students' scores on each factor related to the Chaoxing Network Teaching Platform. Using SPSS 29.0, the analysis examined the impact of age, academic year, and subject area as grouping variables on the four factors of CNTP use. The results showed no significant differences in Performance Expectancy, Effort Expectancy, Hedonic Motivation, or Habit across age groups, grade levels, and subject disciplines.

4. Discussion

4.1. Discussion of Findings

4.1.1. High Acceptance of the Chaoxing Network Teaching Platform (CNTP)

The findings indicate that CNTP is widely accepted among college students, as evidenced by the strong structural relationships observed in the SEM results. Performance Expectancy (PE) recorded the highest mean score (M = 16.1304), suggesting that students perceive CNTP as a highly effective learning tool that enhances their academic performance. This aligns with prior research on technology acceptance, which emphasizes the role of perceived usefulness in driving adoption behavior [4]. Moreover, the significant path coefficient between Habit (HB) and CNTP acceptance ($\beta = 0.286$, $p < 0.001$) suggests that frequent exposure fosters habitual usage, reinforcing students' reliance on the platform.

4.1.2. The Influence of CNTP on Student Engagement and Learning Effectiveness

Despite its high acceptance, CNTP presents mixed results regarding student engagement. While Effort Expectancy (EE) scored relatively high (M = 15.8820), Hedonic Motivation (HM) had the lowest mean value (M = 11.8696), indicating that students do not perceive the platform as particularly enjoyable. This is further supported by the correlation analysis, where HM exhibited weaker associations with PE ($r = 0.817$, $p < 0.001$) and EE ($r = 0.709$, $p < 0.001$), suggesting that enjoyment is not a primary factor in students' acceptance of CNTP. The low HM score highlights the need for interactive and gamified elements to enhance engagement. Prior research supports this, indicating that entertainment features can increase motivation in online learning environments [14].

4.1.3. Challenges in Enhancing Self-Regulated Learning (SRL)

Although CNTP provides structured learning resources, challenges remain in fostering students' online self-regulated learning (OSRL). Regression analysis shows that PE ($\beta = 0.284$, $p < 0.001$) and EE ($\beta = 0.295$, $p < 0.001$) significantly contribute to CNTP acceptance, yet SRL strategies are not explicitly embedded in the platform. Previous studies suggest that digital learning platforms must integrate adaptive learning pathways and real-time feedback to support self-regulated learning [15]. Therefore, incorporating AI-driven recommendations and personalized learning tools could improve students' ability to self-regulate their learning processes effectively.

4.1.4. Explanations for Non-significant Differences

The independent samples t-test results revealed no significant differences in CNTP usage based on gender or regional background. This may be due to the widespread availability of CNTP in universities, ensuring equitable access regardless of demographic characteristics. Furthermore, since CNTP is primarily utilized for learning purposes, students' engagement with the platform is largely driven by course requirements rather than individual preferences [16].

The narrowing digital divide, particularly the improved accessibility of internet services in rural areas, may have further mitigated regional disparities in technology adoption. Additionally, gender differences in digital learning have become less pronounced in educational settings, as both male and female students are equally exposed to online learning platforms [17]. These findings suggest that

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institutional support, learning demands, and technological advancements play a more critical role in shaping CNTP usage than demographic factors.

4.2. Research Recommendations

Based on the key findings of this study, the following recommendations are proposed to optimize CNTP's functionality and enhance students' online self-regulated learning (OSRL) Jeong [18] and learning outcomes:

4.2.1. Enhancing Interactive and Game-Based Elements to Boost Engagement

The findings indicate that Hedonic Motivation (HM) had the lowest mean score (M = 11.8696), suggesting that students do not perceive CNTP as particularly enjoyable. To address this, the platform could incorporate interactive and gamified elements such as point-based rewards, virtual learning communities, and Game-Based quizzes to foster a more engaging learning experience.

4.2.2. Integrating AI-Driven Personalized Learning Recommendations

This study reveals that Effort Expectancy (EE) and Performance Expectancy (PE) significantly influence CNTP acceptance, yet the platform currently lacks personalized learning support. Future improvements could include AI-driven recommendation systems that analyze students' learning behaviors and progress to provide tailored learning paths and resource suggestions, thereby enhancing students' self-regulated learning capabilities.

4.2.3 Integrating Self-Regulated Learning (SRL) Strategies in CNTP

Although CNTP provides structured learning resources, challenges remain in fostering students' online self-regulated learning (OSRL). To address this, the platform should integrate time management reminders, self-reflection logs, and real-time feedback mechanisms to help students proactively plan, monitor, and regulate their learning processes more effectively.

4.2.4. Optimizing User Interface (UI) and Navigation for Better Learning Efficiency

The study findings indicate that students rated Effort Expectancy (EE) relatively high, suggesting that CNTP is perceived as easy to use. However, further UI and navigation optimizations could improve learning efficiency by reducing unnecessary steps and providing more intuitive learning pathways, thereby minimizing cognitive load and enhancing the overall learning experience.

5. Conclusion

This study examined the factors influencing students' acceptance and use of CNTP, employing the UTAUT2 framework and structural equation modeling (SEM). The results confirm that Performance Expectancy, Effort Expectancy, Habit, and Hedonic Motivation play significant roles in determining students' engagement with CNTP. Notably, while students recognize CNTP's educational benefits, its limited entertainment value suggests potential areas for improvement in engagement-driven design.

The findings contribute to the existing literature by highlighting the dual role of perceived usefulness and habit in technology adoption within online learning environments. However, the study also reveals challenges in fostering self-regulated learning, emphasizing the need for enhanced interactive features and adaptive learning strategies. Future research should explore longitudinal effects and comparative analyses with other Network Teaching Platforms to provide deeper insights into effective digital education strategies.

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The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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