



Research on Pathways and Effectiveness Evaluation Framework for Enhancing Digital Literacy Among Vocational College Students Through Artificial Intelligence

Dandan Wang^{1,*}

¹ School of Digital Media, Chongqing Technology and Business Institute, Chongqing, 400000, China

SUMMARY: *In the epoch of fast development of digital technique, enhancing the digital accomplishment of vocational school students is possessing great importance. This thing is necessary not only for their each person's growth and the ability which they use to adapt society, but also for the competition ability of their future work. This research places focus on the combination of promotion of digital literacy and artificial intelligence. According to the present digital abilities of vocational school students, this paper finds out the basic causes of the differences in digital literacy among these students and thus puts forward specific methods of integration. Furthermore, through making reference to the UTAUT model and self-determination theory, this research carries out deep exploration into the factors which influence the digital literacy of vocational school students. The average digital literacy score of the investigated vocational college students was 57.5 points, with the scores of the samples ranging between 40 and 80, which therefore shows that their overall performance is generally mediocre. Further investigation of the elements that influence students' digital literacy shows that performance expectations, effort anticipations, social impacts, and individual convenience situations have a notable positive influence on the motivation of vocational college students for promoting their digital literacy. This driving force, as a result, has influence upon the digital reading ability of students who study at vocational colleges.*

KEYWORDS: *Artificial Intelligence; UTAUT Model; Self-Determination Theory; Digital Literacy of Vocational College Students*

1 Introduction

Against the backdrop of accelerating digital transformation in the global economy, digital technologies are profoundly reshaping human ways of thinking, living, producing, and learning, driving profound changes in the global political, economic, technological, cultural, and security landscapes [1, 2]. Digital literacy has emerged as a key indicator for measuring a nation's international competitiveness and soft power [3]. Within the realm of higher vocational education, digital literacy stands as an essential foundational skill for college students, profoundly influencing their personal development, career planning, and level of societal engagement [4, 5].

The rise of artificial intelligence technology has brought unprecedented opportunities and challenges to higher vocational education [6]. On one hand, AI, with its powerful capabilities in information integration and intelligent generation, provides college students with richer,

*anita925@163.com

<https://doi.org/10.65102/is2026613>

more personalized learning resources and tools. This significantly expands learning boundaries and drives profound transformations in learning methods [7, 8]. On the other hand, it also imposes higher demands on students' digital literacy, including digital generation skills, data-driven decision-making abilities, information filtering and critical thinking capabilities, as well as ethical awareness and sense of responsibility [9, 10]. Conducting in-depth research on pathways to cultivate students' digital literacy in the context of artificial intelligence holds significant theoretical value and practical relevance.

Reference [11] developed a digital literacy assessment tool and employed quantitative methods to survey 318 undergraduates. They proposed that in the AI era, digital literacy comprises four competency sub-factors: critical understanding, awareness of AI's societal impacts, AI technology application, and ethical conduct. AI technology presents new opportunities for enhancing college students' digital literacy [12]. Reference [13] investigated the relationship between generative AI applications and students' innovation capabilities and digital literacy. Results indicated that generative AI applications significantly positively impacted students' innovation capabilities and digital literacy. Reference [14] explored the interrelationship among digital literacy, misinformation, and AI within a quality education framework. AI aids students' comprehension of abstract information and promotes critical use of digital tools to enhance digital literacy. Reference [15] explores practical strategies for enhancing digital literacy through information and communication technologies (ICT) and AI. Utilizing tools such as online courses, AI tutoring systems, and neurofeedback systems, it demonstrates through case studies that ICT and AI improve learners' cognitive levels, increase learning motivation, and foster digital literacy development. Reference [16] proposes an educational approach integrating augmented reality and AI technologies with learning management systems. A quantitative comparative experiment involving 39 students revealed, through t-test statistical analysis, that this educational method significantly and positively impacted students' critical thinking skills and digital literacy. Literature [17] conducted an online survey of 350 undergraduates from two top universities in mainland China and Hong Kong during the 2023–2024 academic year. Findings revealed that students frequently using generative AI tools during the design concept phase improved their time management skills and reduced anxiety, thereby deepening their understanding of digital technologies in architectural education. Additionally, scholars have investigated AI's impact on teachers' digital literacy. Reference [18] invited 36 pre-service Turkish teachers to participate in a controlled-group experimental design, revealing the impact of AI tools on teachers' digital literacy levels. The findings confirmed the effectiveness of AI tools in cultivating digital skills.

With the continuous evolution and widespread application of generative AI technology, approaches to cultivating digital literacy have transcended conventional limitations. Reference [19] noted at the 4th International Conference that in the AI era, higher education institutions can enhance the development of digital knowledge, skills, and expertise by improving digital infrastructure and refining digital curriculum systems, thereby enriching the formats of digital literacy training. Reference [20] proposes an intelligent education optimization model demonstrating high generalization capabilities across personalized instruction, blended online learning, and project-based teaching scenarios. Even under abnormal network conditions, its teaching resource allocation efficiency remains above 60%, effectively enhancing the intelligence and efficiency of instructional decision-making. Reference [21] proposes diversified foreign language talent development pathways for the AI era. By employing AI-empowered character education methods, constructing diversified curriculum systems, and innovating interdisciplinary course clusters, it establishes an effective multilingual talent cultivation framework. Reference [22] leverages generative AI to innovate digital literacy enhancement pathways. Research findings indicate that preschool education students perceive

AI software as beneficial for improving their learning performance, experience, and satisfaction, demonstrating strong practical value.

The application of artificial intelligence and the enhancement of digital literacy play a crucial role in achieving learning outcomes and boosting learning interest [23]. Reference [24] employed linear regression to predict the impact of artificial intelligence and digital literacy on online learning outcomes among undergraduates at the University of the South-East in Nigeria, concluding that digital literacy and the integration of artificial intelligence are key factors in predicting students' online learning outcomes. Meanwhile, [25] demonstrated the effectiveness of integrating AI and digital literacy into teacher education by incorporating AI technology into teaching environments to enhance educational tools. Modular structured instruction improved participants' digital capabilities, boosting both digital confidence and competence. Recent studies have reported on the mutual influence between AI and digital literacy, though the underlying mechanisms require further investigation. For instance, [26] revealed AI's mediating role in advancing career and talent development through digital literacy—specifically, AI enhances the impact of students' digital literacy on self-efficacy, while digital literacy significantly influences students' attitudes toward AI.

The widespread application of artificial intelligence imposes higher demands on college students' digital literacy. To adapt to learning environments supported by new technologies, students must develop core competencies including digital generation skills, data-driven decision-making abilities, information filtering and critical thinking capabilities, as well as ethical awareness and a sense of responsibility [27, 28]. Leveraging this technology enables students to engage more conveniently in self-directed and inquiry-based learning, thereby enhancing their digital literacy and innovation capabilities. Higher education institutions can also leverage generative AI to innovate curriculum systems and teaching models, thereby improving the quality and effectiveness of digital literacy education [29, 30].

This paper constructs a digital literacy measurement system model for vocational college students from five perspectives, including digital awareness and digital security, and examines the current level of digital literacy among vocational high school students. Based on survey results and status analysis, it identifies the causes of digital competency gaps among vocational students and outlines pathways for enhancing their digital literacy. By integrating the UTAUT theoretical model with self-determination theory, this study constructs a model of factors influencing vocational students' digital literacy and proposes corresponding research hypotheses. Data analysis employs multiple linear regression equations to clarify the relationships between various influencing factors and digital literacy levels among vocational students. Structural equation modeling is used to sequentially validate the aforementioned hypotheses, yielding the research findings.

2 Research Design

2.1 Research Subjects

This research puts its focus on the students who are currently studying in seven vocational colleges inside Area X. For guaranteeing the comprehensiveness of the sample, this research selects students who are in the same grade from four different majors: Digital Media Technology, Film and Television Animation, Network News and Communication, and Integrated Media Technology and Operation. Our investigation question papers were designed and produced by making use of the "Wenjuanxing" network platform, and were sent out to vocational college students by ways which include WeChat and QQ. Our data collection time frame covered the period from December 2023 to October 2024. In the whole, 350 investigation

papers were given out in this period. After we have excluded 30 questionnaires that are not valid, 320 valid questionnaires have been ultimately obtained, therefore this gives an effective response rate of 91.43%.

Table 1 gives the basic distributing situation of the specimen. The effective samples are quite evenly scattered in grade levels, disciplines, and male-female proportions, hence it displays strong representativeness. In all the participants, the gender ratio is kept good and even, with male persons taking 51.25% and female persons composing 48.75%. In this research work, the distribution situation of other sample kinds was adjusted by us to a comparatively balanced state.

Table 1: Data sample distribution

Type	Classification	Number of students per person	Percentage /%
Professional	Digital Media Technology,	75	23.44%
	Film and Television Animation	80	25.00%
	Network News and Communication	80	25.00%
	Integrated media technology and operation	85	26.56%
Grade	Higher vocational grade 1	98	30.63%
	Higher vocational grade 2	102	31.88%
	Higher vocational grade 3	120	37.50%
Gender	Male	164	51.25%
	Female	156	48.75%

2.2 Research Tools

(1) Individual basic information

This study employs a questionnaire approach to measure vocational college students' digital literacy and its influencing factors. The first section collects basic personal information, including gender, hometown, parents' educational attainment, and major of study.

(2) Measurement Scale of Digital Literacy

The second section presents the Digital Literacy Measurement Scale for vocational college students, which measures the study's dependent variables. Digital awareness and digital information and data processing abilities are assessed through single-choice questions. Digital communication and collaboration, digital learning and innovation, and digital security are measured using five-point Likert scale items. This yields a 22-item vocational college digital literacy assessment with a total score of 100 points (scores for the five dimensions are 18, 22, 18, 23, and 19, respectively).

The results gotten from the reliability and validity testing show that the whole Cronbach's α coefficient of this scale reaches 0.91. This therefore indicates that the scale has high reliability and excellent inside consistency. The Cronbach's α coefficient values of each section inside the scale were all higher than 0.8, this means that the reliability is good. In addition, the Cronbach's α coefficient did not have an obvious rising when the items got removed, this shows the design of the scale has reasonableness.

The digital literacy measurement scale which is for higher vocational students has been analyzed through the software SPSS 27, therefore we especially use the KMO (Kaiser Meyer - Olkin) test. The outcomes from the Meyer-Olkin test and the Bartlett sphericity test have indicated that the KMO value of our scale has reached 0.985, which is higher than 0.6. The P-value which comes from the Bartlett sphericity test is 0.000*, it is lower than 0.05, therefore it

means that the result has statistical significance. This meaning shows that among the variables there exists a correlation, especially the digital elements that are inside the measuring scale for higher vocational students. On the whole, this digital literacy measurement scale which is for higher vocational students is highly suitable for exploratory factor analysis.

The results obtained from exploratory factor analysis show that for the three first-order indicators, that is digital communication and cooperation, digital study and creation, and digital security, the square root numbers of the Average Variance Extracted (AVE) are 0.651, 0.721, and 0.573 separately. All these numerical values are higher than the Pearson correlation values of other influencing factors. Therefore, this hence indicates that the measurement scale which is for the digital literacy of higher vocational students possesses outstanding discriminant validity. At the same time, the value of composite reliability (CR) which is the lowest in all the first-level measurement indicators was 0.823, hence it exceeds the 0.7 threshold that has been specified. Furthermore, the lowest average variance (AVE) was 0.573, that is larger than the threshold value of 0.5. This just now shows that the digital literacy measurement scale which is for higher vocational students possesses good convergent validity.

(3) Scale of Influencing Factors of Digital Literacy

The third section comprises the scale for factors influencing vocational students' digital literacy. This section explores variables affecting digital literacy levels, including six independent variables: performance expectations, effort expectations, social influence, intrinsic motivation, convenience conditions, and willingness to improve, along with one moderating variable—self-efficacy. The scale comprises 22 measurement items in total.

The results gotten from the reliability and validity checkings show that the whole Cronbach's α coefficient of the scale reaches 0.892. Furthermore, the Cronbach's α coefficient values of each individual index inside the scale are all higher than 0.8. This hereby indicates that the scale has good reliability and excellent internal consistency. The results obtained from the validity test indicate that the entire KMO value of this measurement scale is 0.955, and the P - value of the Bartlett sphericity test result is 0.000*. This indicates that a correlation exists among these variables, hence this scale is suitable to be used for exploratory factor analysis. The outcome of the exploratory factor analysis indicates that for the six variables—performance expectation, effort expectation, social influence, internal motivation, convenience situation, and improvement willingness—the square-root values of the Average Variance Extracted (AVE) are 0.703, 0.689, 0.674, 0.592, 0.606, and 0.719 respectively. All these numerical values are larger than the Pearson correlation numerical values of the other factors and also go beyond the threshold value of 0.5. In addition, the most tiny value of Composite Reliability (CR) is 0.837, which is higher than the threshold value of 0.7. This hence illustrates that the scale possesses good convergent validity.

2.3 Current State of Digital Literacy Among Vocational College Students

2.3.1 Overall Situation

Figure 1 shows the overall digital literacy scores of vocational college students. The histogram distribution reveals that the scores of the 320 vocational college student samples exhibit a right-skewed distribution, with a mean of 57.7 points and a standard deviation of 22.99. Approximately 58.13% of the samples fall within the 40–80 point range, indicating that the overall digital literacy performance of students at vocational colleges in Region X is generally average.

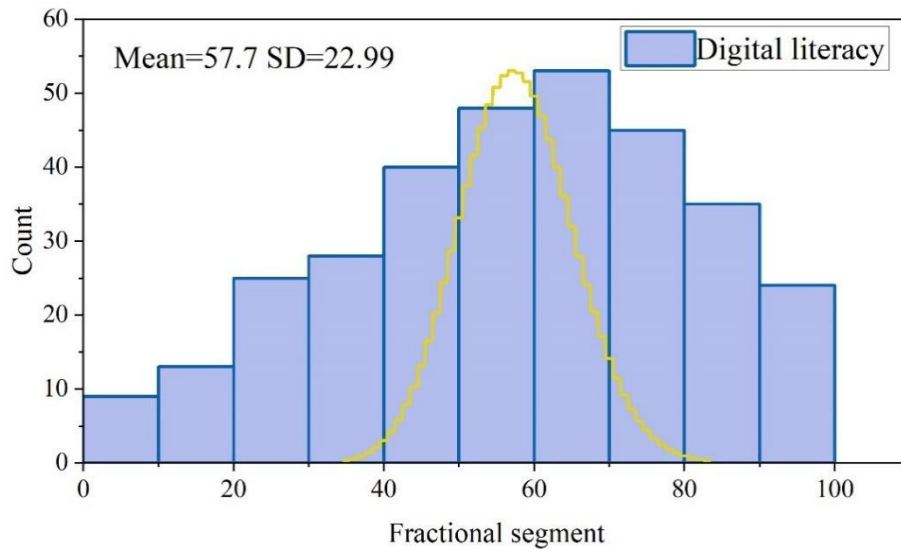


Figure 1: The overall score of the digital literacy of higher vocational students

2.3.2 Status of Each Dimension

In the last section, an all-round conclusion on the digital literacy marks of vocational college students in Area X was put forward. For obtaining a more profound understanding about the basic mechanisms that bring about these large-range transformations, thus it is necessary that we conduct an investigation into the condition of every respect of digital literacy. Figure 2 gives depiction of the scores for each different aspect of digital literacy. The average scoring values (percentage of scoring) in the five aspects, which are arranged from high to low, are as follows: the average scoring value (percentage of scoring) for Digital Information and Data Processing is 17 (73.91%); Study Digitally and Creation Ability: 15.6 (70.91%), Digital Awareness: 12.8 (67.37%), Digital Communication and Coordination: 10.5 (58.33%), Digital Security: 8.8 (48.89%). This thing that is discovered by us is that Digital Information and Data Handling have the most extremely prominent performance. The proficiency in this competency directly influences the overall digital literacy of vocational college students.

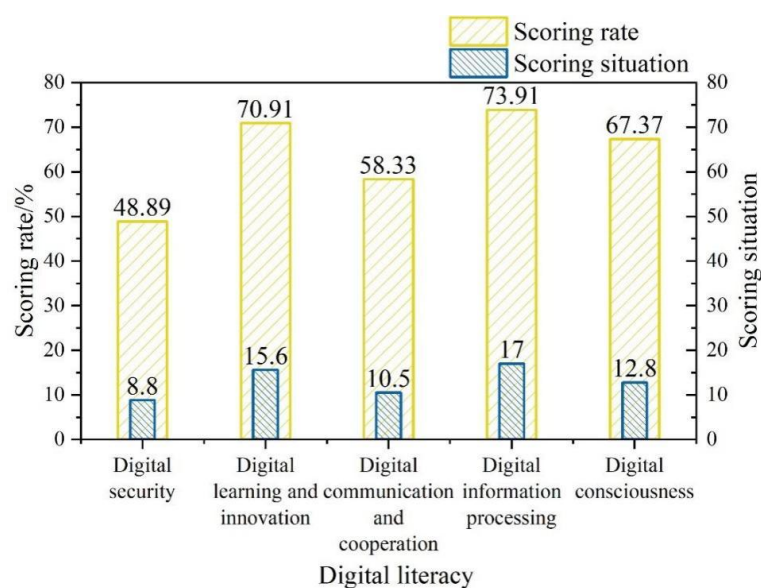


Figure 2: Digital literacy scores in different dimensions

2.3.3 Analysis of Digital Literacy Heterogeneity Among Different Groups

(1) Different Majors

All of our whole sample was divided into four sorts on the basis of people's major. These classifications are Digital Media Tech (Z1), Movie and Television Cartoon Making (Z2), Net tidings and Exchange (Z3), and Synthesis Media Tech and Running (Z4). Univariate analysis of variance (ANOVA) and independent samples t-tests were conducted sequentially. Test results indicate that vocational high school students across different majors exhibit homogeneity of variance in numerical awareness, thus permitting the use of a t-test for equal variances. However, they demonstrate heterogeneity of variance in digital literacy and other dimensions, necessitating Levene's test for unequal variances. The heterogeneity test results for different majors are shown in Table 2. Significant differences were found in the digital literacy scores and scores across all dimensions among vocational high school students from different majors (all test statistics were significant at the 1% level).

In the digital literacy achievement scores, when we arrange them from the highest score to the lowest score, they are: Film and Television Animation (81.58), Network News and Spread (76.69), Digital Media Technology (71.36), and Comprehensive Media Technology and Management (67.49). It is worth noting that, when we make the comparison with students of the other three majors, vocational high-school students who take Film and TV Animation as their speciality have much higher digital literacy scores, and also have higher scores in every respect.

Table 2: Heterogeneity testing of different majors

Literacy name	Majors	Mean value	SD	Test statistic	Professional comparison
Digital literacy	Z1	71.36	14.36	18.324***	Z2> Z3> Z1> Z4
	Z2	81.58	15.63		
	Z3	76.69	12.74		
	Z4	67.49	11.26		
Digital consciousness	Z1	6.91	4.56	14.385***	Z2> Z3> Z4> Z1
	Z2	9.11	3.25		
	Z3	8.93	5.59		
	Z4	7.95	3.64		
Digital information processing	Z1	16.25	5.76	19.364***	Z2> Z3> Z1> Z4
	Z2	19.29	4.36		
	Z3	17.12	4.29		
	Z4	15.36	3.15		
Digital communication and cooperation	Z1	9.81	6.54	17.798***	Z2> Z3> Z1> Z4
	Z2	12.46	5.69		
	Z3	11.16	4.85		
	Z4	8.69	5.39		
Digital learning and innovation	Z1	14.74	3.86	12.869***	Z2> Z3> Z1> Z4
	Z2	16.65	3.19		
	Z3	15.15	2.89		
	Z4	14.26	2.48		
Digital security	Z1	7.36	3.64	13.587***	Z2> Z3> Z1> Z4
	Z2	9.15	4.23		
	Z3	8.83	2.64		
	Z4	7.16	3.48		

(2) Different Grade Levels

Table 3 has given the results of heterogeneity examinations that have been done among different grade ranks. Among students who come from different grades, there are obvious differences in digital literacy and also scores in all kinds of dimensions. The digital literacy scores from highest to lowest across grade levels are: Grade 3 > Grade 2 > Grade 1, with respective scores of 80.25, 65.69, and 60.25. Third-year students possess a foundation in professional theory and have more free time. Additionally, the third year is the period of concentrated professional internships. During this stage, students learn digital technologies and collect and process digital information based on vocational skill requirements, resulting in the highest digital literacy scores.

Table 3: Heterogeneity tests in different grades

Literacy name	Grade	Mean value	SD	Test statistic	Grade comparison
Digital literacy	Higher vocational grade 1	60.25	14.39	20.488***	Higher vocational grade 3> Higher vocational grade 2> Higher vocational grade 1
	Higher vocational grade 2	65.69	15.64		
	Higher vocational grade 3	80.25	12.74		
Digital consciousness	Higher vocational grade 1	8.74	11.36	18.798***	Higher vocational grade 3> Higher vocational grade 2> Higher vocational grade 1
	Higher vocational grade 2	10.89	4.53		
	Higher vocational grade 3	14.69	3.84		
Digital information processing	Higher vocational grade 1	15.26	5.16	19.365***	Higher vocational grade 3> Higher vocational grade 2> Higher vocational grade 1
	Higher vocational grade 2	16.36	3.48		
	Higher vocational grade 3	20.69	5.98		
Digital communication and cooperation	Higher vocational grade 1	7.99	4.63	21.268***	Higher vocational grade 3> Higher vocational grade 2> Higher vocational grade 1
	Higher vocational grade 2	9.75	4.23		
	Higher vocational grade 3	12.56	3.18		
Digital learning and innovation	Higher vocational grade 1	14.26	3.84	18.658***	Higher vocational grade 3> Higher vocational grade 2> Higher vocational grade 1
	Higher vocational grade 2	14.96	3.18		
	Higher vocational grade 3	16.98	2.63		
Digital security	Higher vocational grade 1	6.54	3.48	19.748***	Higher vocational grade 3> Higher vocational grade 2> Higher vocational grade 1
	Higher vocational grade 2	7.95	4.36		
	Higher vocational grade 3	9.29	2.95		

(3) Gender Differences

Table 4 presents the heterogeneity of digital literacy across genders. Significant differences exist in digital literacy scores and their respective dimensions between male and female vocational college students (Levene's statistic is significantly positive at the 1% level). Female students consistently scored higher in digital literacy than males (63.18 > 61.26). The potential reason for females' superior performance in digital literacy may lie in their greater willingness to invest effort in academics and their more diligent learning attitudes.

Table 4: Heterogeneity of digital literacy of different genders

Literacy name	Gender	Mean value	SD	Levene statistic
Digital literacy	Male	61.26	15.84	5.425***
	Female	63.18	14.32	4.298**
Digital consciousness	Male	11.31	4.74	3.645***
	Female	13.25	3.25	6.425**
Digital information processing	Male	15.48	5.39	7.498***
	Female	19.63	4.96	4.365***
Digital communication and cooperation	Male	10.26	3.25	2.364***
	Female	10.82	2.48	3.215**
Digital learning and innovation	Male	14.74	5.36	2.364***
	Female	16.39	5.48	3.545**
Digital security	Male	8.26	4.99	4.569***
	Female	8.48	4.59	2.485***

3 Causes of Digital Literacy Deficiencies Among Vocational College Students and Pathways for Improvement

3.1 Reasons for the Lack of Digital Literacy Among Vocational College Students

3.1.1 Top-Level Design

In recent years, as digital transformation advances, various studies indicate that demand for digital talent continues to grow, primarily because talent development lags behind market needs. Currently, there is no unified definition of the concept and scope of digital literacy cultivation, nor are there corresponding training frameworks or evaluation systems. The absence of top-level design has led to insufficient recognition of its value and significance among institutions, resulting in divergent training approaches that also hinder the development of digital literacy among vocational college students.

3.1.2 School Education

First, the digital literacy cultivation system is unclear and incomplete. There is a lack of theoretical research and practical experience in digital literacy. Talent development plans and supporting measures for digital literacy cultivation are inadequate. Different majors lack a clear framework for digital literacy cultivation, and there is no clear direction for cultivation content and evaluation methods, which affects the cultivation and enhancement of digital literacy.

Secondly, the resources for teaching are not enough, and thus we have an urgent need to promote teachers' digital ability level. Teachers, therefore, hold a core position in the cultivation of digital literacy among vocational school students. For the effective cultivation of students' digital literacy, they need to have high-level digital awareness, well-polished digital techniques, and high-level instruction capabilities. In current time, teachers only make use of digital software on a primary level. They have a shortage of abilities connected to digital optimization, digital innovation, and humanistic qualities (for example, digital emotional quotient and digital values).

Thirdly, the curriculum framework has the deficiency. It not only has no special courses that concentrate on digital literacy, but also cannot bring elements which promote digital literacy into the specialized courses. This insufficiency means that students cannot obtain basic digital

knowledge and skills, which therefore hinders the further development of their digital ability level.

Fourthly, the digital construction facilities inside school are still not enough. The construction of digital basic facilities requires a great deal of capital input, thus the amounts of funds that different vocational colleges can obtain have extremely large differences. Colleges that have limited money often do not have good enough digital basic facilities, for instance intelligent campus systems, smart classrooms, and digital living platforms which can support digital study and campus daily life. In addition, they face the lacks of extra digital materials and computer programs.

3.1.3 Social Environment, Family Education, and Self-Education

The students of vocational colleges are at the most active stage of their lives, this therefore causes their thinking ways to be extremely easy to be influenced by social and family environments. In current time, the society circumstance that cultivate digital literacy is not enough. Furthermore, the digital resources which are provided by main-stream media and institutions of higher education do not have enough kinds of content, hence they can only attract a small quantity of students. Under the effect of many different cultures, the viewpoint that pursues pleasure and the idea that values materials have got out of control in the Internet space. Staying for a drawn-out length of time in such a non-regulated environment can easily cause bad alterations in the weak psychological state and opinions of vocational school students. At the same time, very many parents only put their focus on the bad aspects of the internet, and thus are not able to recognize its good potential possibilities. Because of this situation, therefore, teachers cannot give guidance to students to let them carry out effective usage of digital resources. Along with students' own weak study motivation and bad self-management, they therefore often put too much time and energy into amusing videos, network games, and such similar contents. This lets their patience toward systematic learning become weaker, thus further damaging their abilities of independent thinking and critical analysis. All these elements hinder the promotion of digital capability among technical college students.

3.2 Strategies and Pathways for Enhancing Digital Literacy Among Vocational College Students

Figure 3 presents a framework for cultivating digital literacy among vocational college students. Based on the aforementioned survey findings and analysis of the current situation, it proposes four pathways for enhancing digital literacy among higher education students [31].

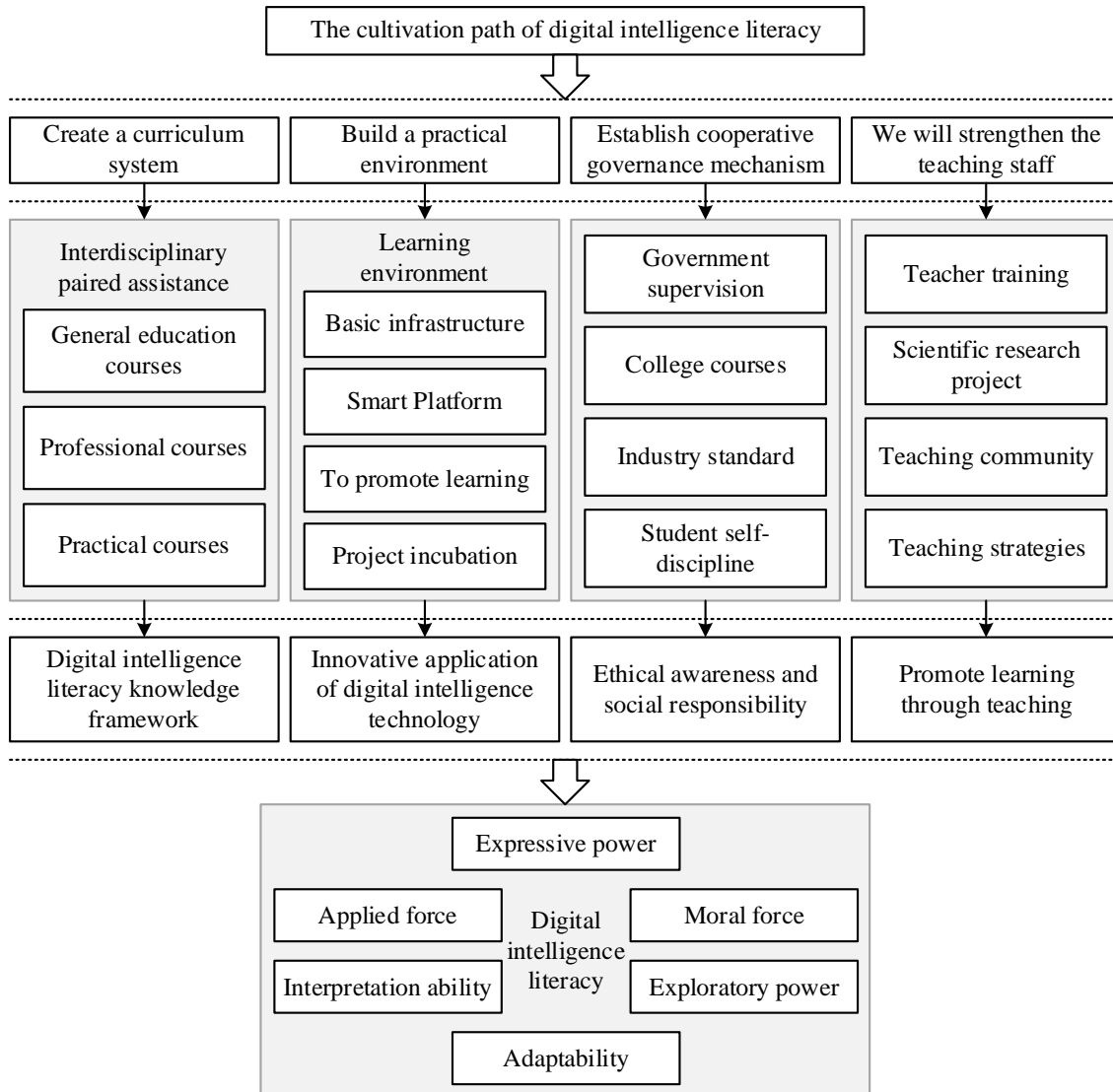


Figure 3: Vocational students' digital literacy culture framework

3.2.1 Breaking Out of the Information Bubble and Building a Practical Environment

The refinement of algorithms is a crucial technological strategy that is used for overcoming information silos. The social media platform and information recommendation system have the obligation to carry out fine adjustment on their algorithms. The objective is to promote the multiplicity and range of content when exhibiting material which accords with the inclinations of users. First, through carrying out recommendation algorithms which take topic diversity as center, it is possible for us to artfully mix popular topics from different fields into the content that is recommended. Let us take the vocational high school students who have enthusiasm for sports as an example. When we give sports-connected news to them, high-quality contents concerning front technology, culture, and the arts also ought to be pushed out. This thus assists in expanding their knowledge scope. Second, functions for the adjustment of personalized recommendations should be provided by the relevant side. These characteristics let vocational high school students according to own demands choose a fixed proportion of information beyond their interest fields. By this method, they are able to actively get themselves out from the restrictions of the information bubble.

The enhancement of media literacy education is an important strategy that can be used to

promote the ability of vocational high school students to distinguish and filter information. The third-level education organizations and the wider society should carry out cooperation on media literacy projects. They can pass media knowledge and information evaluate abilities to vocational study persons through speech and special curricula. Through inviting media experts to explain in detail media working rules, information diffusion characteristics, and common methods for fabricating fake information, these classroom talks raise students' understanding of media content. In the classroom teaching, the educators can select out typical fake news cases. Through case check and group discussions, they guide students to in order analyze content shortcomings, spread networks, and social harms. This case-based teaching method can cultivate students' capabilities of distinguishing information.

3.2.2 Optimize digital education curricula and develop instructional materials.

3.2.3 Fostering Collaborative Education Mechanisms Through Multi-Party Participation

The common participation of family units, social circles, and advanced education organizations in cultivating digital reading and writing abilities among vocational senior middle school students can avoid the appearance of responsibility vacuums and functional overlaps among educational related participants. The gathering of high-quality education resources produces a united strength for talent nurturing. The family is the basic environment which the vocational high school students grow inside. The parents should undertake the responsibility of constructing a positive digital environment. This requires not only reasonably assigning digital equipment to provide nice digital learning environments but also promoting one's own digital ability level. Through both teaching conduct and model demonstration, parents ought to guide students to utilize digital technologies in correct ways, hence cultivating healthy digital learning habits and ethical standards. The society is an important platform that can promote the digital literacy ability of vocational high school students. Government organs ought to constitute macro-direction guiding and capital giving policies for digital literacy enhancement work. They ought to provide financial and preferential policy assistance for the building of digital campuses, push the balanced development of digital resources in higher education, and perfect laws and regulations that relate to digital security and ethics, hence to build a good social environment for the enhancement of students' digital literacy. Enterprises ought actively to provide chances for internship and practical training, thus letting students cultivate their digital abilities in real work situations of the actual world. Social organization bodies ought to arrange many kinds of digital culture activities, such as digital art exhibitions and digital creation competitions, to build an active digital culture which excites students' study enthusiasm and creation spirit. Institutions of higher education, which act as the main forward positions for nurturing the constructors and inheritors of socialism, therefore possess the duty to establish an overall digital literacy education curriculum system. They ought to put digital literacy education into special teaching for enhancing the quality of instruction. At the same time, they have the necessity to strengthen the construction of campus digital culture through organizing various digital culture activities for the creating of a fit digital learning environment. Furthermore, they ought to strengthen communication and cooperation with families and society, so as to timely grasp the digital learning situations of vocational high school students when they are at home and in the community, hence adjust digital literacy cultivation strategies on this basis.

3.2.4 Strengthen Faculty Development to Enhance Teaching and Learning

The study of technology is a new pattern of education efficiency and is a basic ability that education workers need to obtain. It is teachers' responsibility that teachers integrate novel

technologies into their teaching methods, therefore students should carry out learning through these novel technologies. The promotion of the digital and intelligent accomplishment of university teachers is a necessary foundation for constructing a high-quality higher education system and cultivating first-class talents. As the core persons in education and teaching activities, teachers' digital literacy levels directly affect the achievement of promoting students' digital ability. Therefore, strengthening the development of professional ability for teachers has hence become a key component of educational projects that aim to promote the digital literacy of students. Only through the cultivation of a teaching contingent which possesses high-level digital literacy can we provide students with outstanding digital education, therefore enabling them to achieve success and grow in a more effective way within the digital era.

4 Constructing a Model of Factors Influencing Digital Literacy Among Vocational College Students

4.1 Theoretical Foundations

4.1.1 UTAUT Model

The Unified Theory of Acceptance and Use of Technology (UTAUT) model brings together many different theories, these include the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivation Model (MM), Theory of Planned Behavior (TPB), Model of Computer Use (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). At last, it identifies four main affecting factors—performance expectation, effort expectation, social influence, and facility—that influence users' tendency and behaviors in the aspect of technology acceptance. In this circumstance, self-efficacy has the function of acting as a moderating factor. The diagrammatic drawing of this model is given in Figure 4[32].

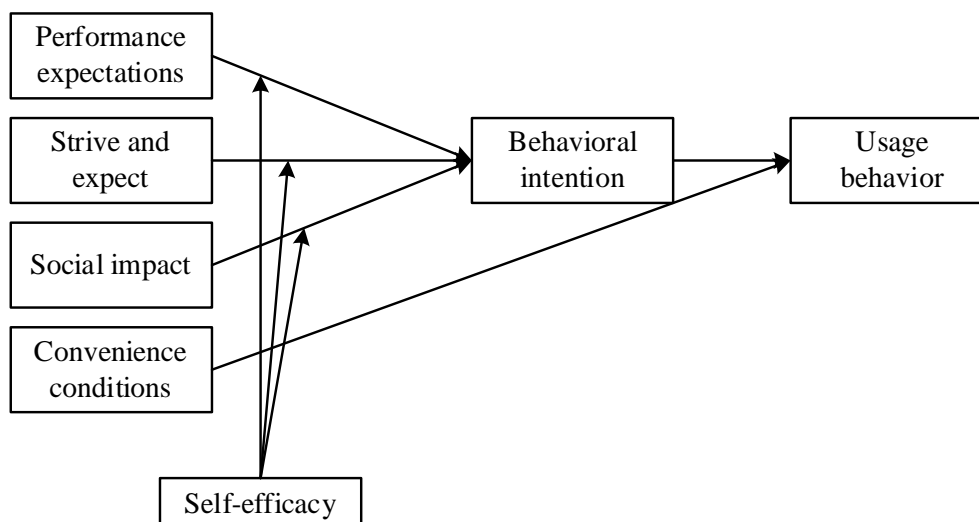


Figure 4: Unified Theory of Technology Acceptance and Use

4.1.2 Self-Determination Theory

Theory of Self-Determination (TSD) is one framework that is used to study the motivation and personality of human beings. This points out the importance of the inside evolution resources in the forming of personality and the self-control of conduct. Intrinsic motivation is the inborn tendency that people pursue new things and meet difficulties, expand and use one's abilities,

and carry out exploration and study. Maintaining and promoting this tendency requires the existence of supporting environments. SDT points out clearly that three basic psychological demands which promote internal power of initiation and help the progress of self-growth: ability, connection with others, and self-control. “Ability” is related to a sensation of being good at things, such as meeting fitting difficulties and getting affirmative appraisals of one’s doing. “Relatedness” shows that we have the need to build and keep good links with other people. “Autonomy” expresses that an individual, whose actions are regarded by themselves as begun from self, are not adjusted from outside or forced.

When we compare the motivation which is forced from outside, the intrinsic motivation, which comes from people’s own interest and happy feeling, thus brings more obvious good results. Even though outside motivation can become inside motivation, the Organismic Integration Theory (OIT) divides it into four kinds: outside control, internalized control, recognized control, and fully integrated control. These dissimilar types of motivation show different degrees of internalization and integration of the values and norms that are connected with the behavior that is required. The degree of inner acceptance increases step by step from the left side to the right side. When individual persons internalize regulations and bring them into their own self-conception, they obtain more autonomy in their behaviors, which can effectively promote the outcomes of their activities. The frame of the self-determination theory is drawn in Figure 5. The behavior which is driven by intrinsic motivation is extremely self-guided, it is done for the purpose of the inner satisfaction, and hence it represents the highest level of self-determination.

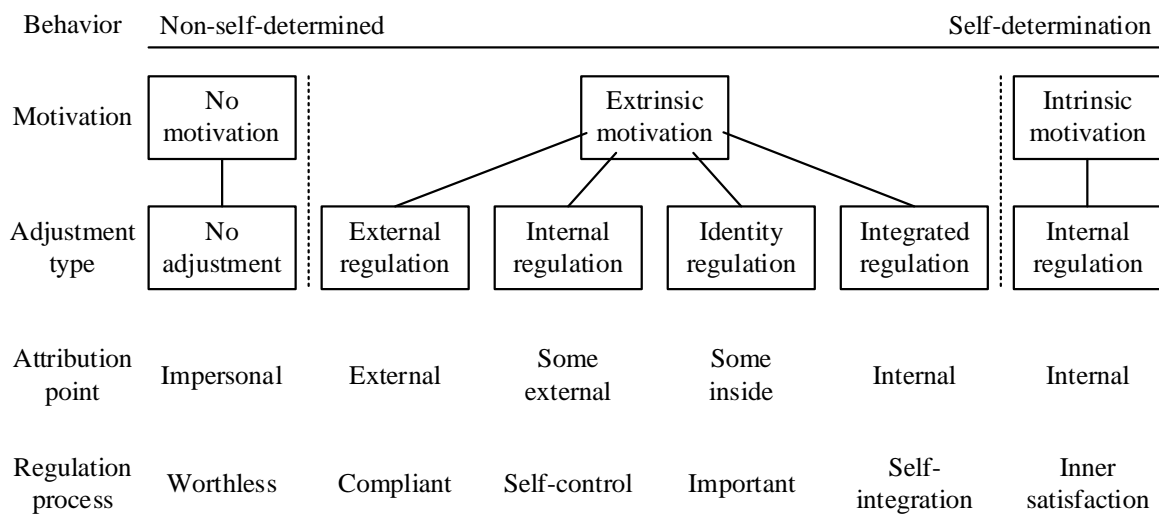


Figure 5: Self-decision theory

4.2 Establishing a Model of Factors Influencing Digital Literacy Among Vocational College Students

4.2.1 Identification of Influencing Factors

The Unifying Theory of Acceptance and Utilization of Technology (UTAUT) framework is often employed to measure the possibility of new technology or product adoption. In the field of education researches, it mainly inspects the acceptance levels and use tendencies of teachers or students for innovative classroom environments, intelligent teaching tools, and other advanced new technologies. In addition, this method can be utilized to research the elements which influence the development of skills. This research puts forward that the views and standpoints of vocational high school students toward digital technology together influence their will to develop digital literacy, which therefore further produces an influence on their

digital literacy. Therefore, this paper hence endeavors to construct a model of the factors which influence the digital literacy of vocational high school students on the basis of the UTAUT framework. The terminology “behavioral intention” is definitely delimited as “developmental intention,” and “performance anticipation,” “effort anticipation,” “social influence,” and “convenience” are contained as influence factors inside this research.

Self-Determination Theory (SDT), which is recognized as a famous theory about motivation, has obtained application and confirmation in many different fields like education, management, and sports science. Furthermore, a great many researches have been conducted on the study and growth of knowledge and skills.

The Self-Determination Theory takes intrinsic motivation as its core research object, which is a complement to the UTAUT model that therefore puts stress on extrinsic motivation. Investigations which combine the UTAUT model together with the Self-Determination Theory have been conducted in both the domestic and the international fields. According to the Self-Determination Theory, this article puts intrinsic motivation, which is an important factor that influences vocational high school students' tendencies for digital literacy growth, into the model.

4.2.2 Research Model and Research Hypotheses

The independent variables are composed of Performance Expectations, Effort Expectations, Social Influence, Support Conditions and Internal Motivation, while Self-Belief acts as a regulating variable.

(1) Performance Expectations

Performance expectancy originally refers to the degree to which individuals believe new technologies can help improve their work performance. It encompasses perceived usefulness, task fit, and outcome expectancy. This study defines it as: vocational high school students' expectation that digital technologies can enhance their standard of living, learning, and work efficiency. Higher performance expectancy may motivate students to consciously improve their digital literacy and take action. Therefore, the following hypothesis is proposed:

Hypothesis H1: Performance expectancy positively influences vocational high school students' intention to develop digital literacy

(2) Effort Expectancy

Effort expectancy originally referred to an individual's perceived ease of using new technologies, encompassing perceived ease of use, perceived complexity, and perceived usability. This study defines it as: vocational high school students' perceived ease of using and learning digital technologies. The perceived difficulty of mastering digital technologies may influence intentions to develop digital literacy. Therefore, the following hypothesis is proposed:

Hypothesis H1: Effort expectancy positively influences vocational high school students' intention to develop digital literacy.

Hypothesis H2: Effort Expectancy positively influences vocational high school students' intention to develop digital literacy.

(3) Social Influence

Social influence originally refers to an individual's perception of the degree to which people they consider important support their use of new technologies. It encompasses subjective norms, social factors, and image status. This study defines it as: vocational high school students' perception of the degree to which important figures in their lives and studies support digital technology. Higher levels of support from those around them may enhance their intention to develop digital literacy. Therefore, the following hypothesis is proposed:

Hypothesis H3: Social influence positively influences vocational high school students' intention to develop digital literacy.

(4) Intrinsic Motivation

Under the frame of self-determination theory, intrinsic motivation is defined as the impulsion that comes from the satisfaction and happiness got directly from taking part in an activity. Under this circumstance, it displays the curiousness and enthusiasm that students of vocational high schools have for the employment of digital technical means. Many years of researches have proven that internal motivation acts as a firm "engine" for study and positive development, and it has the possibility to push persons to bring up digital cultivation ability:

Hypothesis H4: Intrinsic motivation positively influences vocational high school students' intention to develop digital literacy.

(5) Enabling Conditions

Enabling conditions originally refer to an individual's belief in the extent of organizational or technological support for adopting new technologies. They encompass resource accessibility, technical feasibility, and compatibility. This study defines enabling conditions as vocational high school students' perception of the extent to which objective factors like technology and resources support their use of digital technologies. Thus, we propose the following hypothesis:

Hypothesis H5: Enabling conditions positively influence vocational high school students' digital literacy.

(6) Enhancement Intentions

Improvement intention primarily refers to vocational high school students' behavioral intention to develop digital literacy, manifesting as intentions to use and learn digital technologies. Generally, stronger learning motivation leads to higher engagement in learning activities, thereby improving learning outcomes. Appropriately enhancing vocational high school students' motivation to develop digital literacy and strengthening their behavioral willingness may facilitate the cultivation of their digital literacy. Therefore, we propose the following hypothesis:

Hypothesis H1: Effort expectancy positively influences vocational high school students' intention to develop digital literacy.

Hypothesis H6: The intention to improve positively influences vocational high school students' digital literacy.

(7) Self-Efficacy

Self-efficacy refers to vocational students' subjective judgment regarding their ability to enhance their digital knowledge and skills and achieve their desired outcomes in the process of improving digital literacy within the digital era context. It signifies the degree of confidence in elevating their own digital literacy and attaining specific results. Self-efficacy theory posits that individuals' perceptions of self-efficacy beliefs and judgments of outcome expectations prompt them to continuously adjust and regulate their behaviors across different contexts and task environments. This theory emphasizes the moderating and controlling role of self-efficacy—a cognitive factor—on behavior.

Based on this, the following hypotheses are proposed:

H7a: Self-efficacy mediates the relationship between performance expectations and vocational students' intention to enhance digital literacy.

H7b: Self-efficacy moderates the relationship between effort expectancy and vocational students' willingness to enhance digital literacy.

H7c: Self-efficacy moderates the relationship between social influence and vocational students' willingness to enhance digital literacy.

H7d: Self-efficacy moderates the relationship between facilitating conditions and vocational students' willingness to enhance digital literacy.

Hypothesis H1: Effort expectancy positively influences vocational high school students' intention to develop digital literacy.

5 Empirical Analysis of Factors Influencing Digital Literacy Among Vocational College Students

5.1 Data Analysis and Research Findings

5.1.1 Descriptive Statistical Analysis

The results of the descriptive statistical analysis primarily include the maximum value, minimum value, mean, and standard deviation. Table 5 presents the descriptive statistics for the variables. The digital literacy influencing factors involved in the theoretical model include Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Intrinsic Motivation (IM), Facilitative Conditions (FC), Self-Efficacy (SE), and Enhancement Willingness (EW). The mean (3.342), maximum value, and minimum value for all variables fall within reasonable ranges. Additionally, the standard deviation for each measured variable is relatively small, approaching 1. This indicates that the vocational college students surveyed demonstrate a high level of agreement with the overall design and item placement of the survey questionnaire. maximum, and minimum values fall within reasonable ranges. Additionally, the standard deviation for each measurement item is relatively small, approaching 1. This indicates that the surveyed vocational college students demonstrate a high level of agreement with the overall design and item configuration of the questionnaire.

Table 5: Variable descriptive statistics

Variable	Item	Maximum value	Minimum value	Mean value	Standard deviation
Performance expectation (PE)	PE1	5	1	3.318	1.148
	PE2	5	1	3.299	1.166
	PE3	5	1	3.248	1.195
	PE4	5	1	3.395	1.169
Effort expectation (EE)	EE1	5	1	3.215	1.148
	EE2	5	1	3.348	1.136
	EE3	5	1	3.369	1.164
	EE4	5	1	3.308	1.136
Social impact (SI)	SI1	5	1	3.318	1.136
	SI2	5	1	3.396	1.148
	SI3	5	1	3.785	1.135
	SI4	5	1	3.399	1.153
Intrinsic motivation (IM)	IM1	5	1	3.318	1.169
	IM2	5	1	3.348	1.166
	IM3	5	1	3.374	1.148
Favorable conditions (FC)	FC1	5	1	3.318	1.136
	FC2	5	1	3.315	1.125
	FC3	5	1	3.248	1.135
Self-efficacy (SE)	SE1	5	1	3.399	1.148
	SE2	5	1	3.396	1.418
	SE3	5	1	3.248	1.169
Enhance willingness (EW)	DI1	5	1	3.248	1.188
	DI2	5	1	3.348	1.165
	DI3	5	1	3.398	1.178
	DI4	5	1	3.248	1.169

5.1.2 Correlation Analysis and Regression Analysis

Pearson correlation analysis is a common statistical method designed to measure the degree of linear relationship between two variables. It uses the Pearson correlation coefficient (often abbreviated as r) to quantify the strength and direction of the linear relationship between these variables. When r approaches 1, it indicates a strong positive correlation between the two variables. When r approaches -1, it indicates a strong negative correlation. When r approaches 0, it indicates no significant linear relationship between the two variables. In this article, every variable is described by the mean value of its measure items, and a Pearson correlation analysis is conducted by us. The Pearson correlation coefficient values are shown in Figure 6. It is very obvious that all the related coefficients, no matter between single variables or between the independent variables and the dependent variable (digital literacy), all are higher than 0. The correlation coefficients fall within the range [0.33, 0.54] and are statistically significant at the 1% level, indicating a significant positive correlation among the variables.

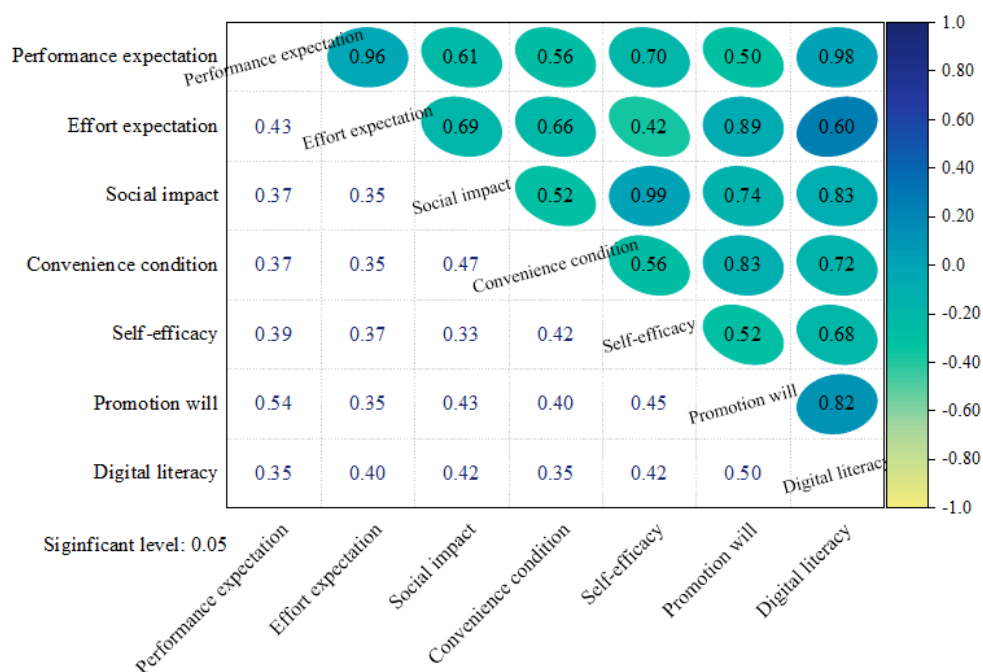


Figure 6: Pearson correlation coefficient

5.1.3 Multiple Linear Regression

This study employs multiple linear regression to examine the relationship between various factors influencing digital literacy and the level of digital literacy among vocational college students. The analysis results are presented in Table 6. The significance P-value of the F-test is 0.000***, indicating statistical significance, which suggests the model generally meets requirements. Observing the multicollinearity of variables reveals that the VIF values are all below 1.5 and less than 10, indicating no multicollinearity issues in the model. Thus, the model is well-constructed. According to the model, vocational college students' digital literacy = $0.784 + 0.126 \times \text{performance expectations} + 0.196 \times \text{effort expectations} + 0.152 \times \text{social influence} + 0.138 \times \text{intrinsic motivation} + 0.083 \times \text{facilitating conditions} + 0.106 \times \text{self-efficacy} + 0.154 \times \text{willingness to improve}$.

Table 6: Multivariate linear regression analysis results

/	Nonnormalized coefficient		Normaliza tion factor	T	P	VIF	R ²	Adjust R ²	F
	B	S.E.	Beta						
Constant	0.784	0.124	-	6.455	0.000***	-	0.498	0.465	F=70.164 P=0.000* **
Performance expectation	0.126	0.039	0.145	3.745	0.000***	1.425			
Effort expectation	0.196	0.035	0.248	5.966	0.000***	1.436			
Social impact	0.152	0.034	0.169	3.648	0.000***	1.412			
Intrinsic motivation	0.138	0.024	0.136	2.844	0.000***	1.315			
Convenience condition	0.083	0.034	0.134	3.469	0.005***	1.398			
Self-efficacy	0.106	0.025	0.248	5.264	0.002***	1.348			
Promotion will	0.154	0.028	0.269	2.486	0.001***	1.324			
Dependent variables: digital literacy									

Note: ***, **, and * represent significance levels of 1%, 5%, and 10% respectively.

Linear regression is a regression analysis method used to determine the quantitative relationship of mutual dependence between two or more variables. Simple linear regression is typically used to examine the relationship between one independent variable and one dependent variable. When multiple independent variables are involved, multiple linear regression is required, which can study the relationship between multiple independent variables and a single continuous dependent variable. The diagram that shows the fitting result is put in Figure 7. From this example drawing, it thus is very clear that the forecast values on the whole are located in the range of the real values. This finding therefore indicates that the model on the whole meets the specified requirements.

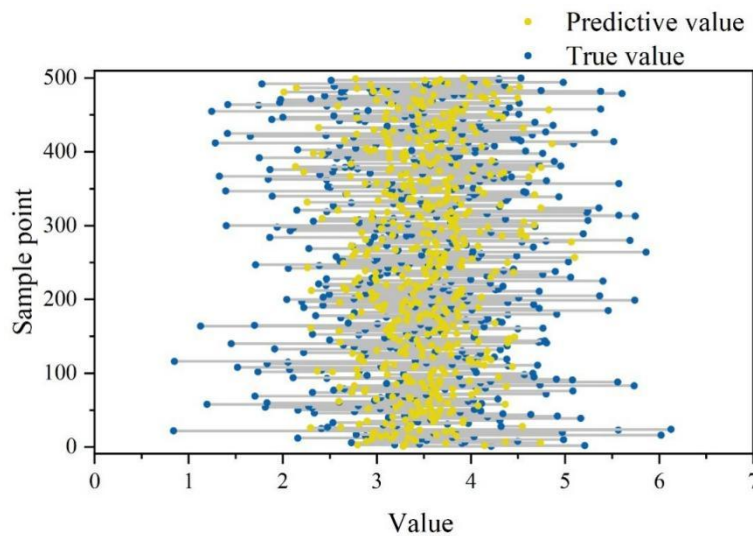


Figure 7: Fitting effect

5.2 Structural Equation Modeling Analysis

This study employed AMOS 26.0 to validate the hypothesized model, yielding standardized path coefficient results as shown in Table 7. Among the ten hypothesized paths from H1 to H7, the significance level P for each path coefficient was less than 0.05, indicating that all paths hold true. Thus, hypotheses H1 through H7 were validated.

Table 7: The results of the quasi-normalized path coefficient

Hypothesize	Path	Estimate (β)	S.E.	C.R.	P	Validation
H1	Performance expectation \rightarrow Digital literacy	0.136	0.064	2.156	0.034	Support
H2	Effort expectation \rightarrow Digital literacy	0.125	0.048	2.348	0.048	Support
H3	Social impact \rightarrow Digital literacy	0.248	0.101	2.52	0.004	Support
H4	Intrinsic motivation \rightarrow Digital literacy	0.644	0.154	4.485	***	Support
H5	Convenience condition \rightarrow Digital literacy	0.515	0.024	19.648	***	Support
H6	Promotion intention \rightarrow Digital literacy	0.174	0.045	3.845	***	Support
H7a	Self-efficacy \rightarrow Performance expectation \rightarrow Digital literacy	0.145	0.045	2.348	0.015	Support
H7b	Self-efficacy \rightarrow Effort expectation \rightarrow Digital literacy	0.369	0.174	2.569	0.011	Support
H7c	Self-efficacy \rightarrow Social impact \rightarrow Digital literacy	0.248	0.136	2.039	0.032	Support
H7d	Self-efficacy \rightarrow Convenience condition \rightarrow Digital literacy	0.748	0.048	22.165	***	Support

Through testing and refinement of the hypothetical model, a revised model of factors influencing the cultivation of digital literacy among vocational college students enabled by artificial intelligence was ultimately obtained, as shown in Figure 8. The coefficient for the path from self-efficacy \rightarrow enabling conditions \rightarrow digital literacy is the highest at 0.75.

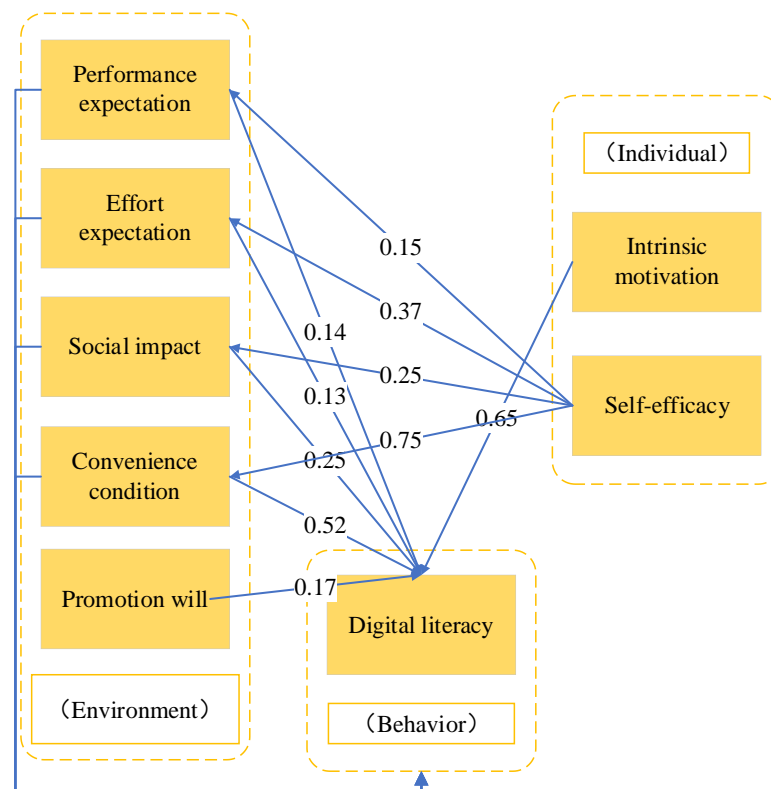


Figure 8: The influence factors of the digital literacy culture of higher vocational student

6 Conclusion

This study analyzes the current state of digital literacy among vocational college students in X region, identifies the causes of their digital literacy deficiencies, and proposes strategies and pathways for enhancing their digital literacy. By integrating the UTAUT model and self-determination theory, we construct a model of factors influencing vocational students' digital literacy and formulate corresponding research hypotheses.

(1) The overall average digital literacy score for vocational college students in the study area was 57.5 points, with a standard deviation of 22.99. About 60 percent of the samples that we got have scores which lie in the interval from 40 points to 80 points. This point therefore indicates that, on the whole, the vocational college students in X have got an average level of digital literacy. When we observe the scores of every individual dimension, the average score of digital information and data handling was 17 points. The qualified rate of this dimension has exceeded 70%, this circumstance displays the strongest performance. The degree of mastery in this specific capability has a direct impact on the whole digital literacy level of students who study in vocational colleges.

(2) Using multiple linear regression to explore the digital literacy levels of vocational college students, the following equation was obtained: Digital Literacy = 0.784 + 0.126*Performance Expectation + 0.196*Effort Expectation + 0.152*Social Influence + 0.138*Intrinsic Motivation + 0.083*Facilitation Conditions + 0.106*Self-Efficacy + 0.154*Desire for Improvement. Using structural equation modeling, we validated the research hypotheses proposed in this paper. The significance level P for all path coefficients was less than 0.05, indicating that all paths were established and the hypotheses proposed in this paper were verified.

Funding

This work was supported by Chongqing Technology and Business Institute (Project No: GZND2025205).

About the Author

Dandan Wang was born in Sichuan Province, P.R. China, in 1982. She obtained a master's degree from Sichuan Fine Arts Institute. She is currently working at the School of Digital Media, Chongqing Technology and Business Institute, as an associate professor, with her main research directions being film and television art and vocational education.

References

- [1] Imamov, M., & Semenikhina, N. (2021). The impact of the digital revolution on the global economy. *Linguistics and Culture Review*, 5(S4), 968-987.
- [2] Xia, L., Baghaie, S., & Sajadi, S. M. (2024). The digital economy: Challenges and opportunities in the new era of technology and electronic communications. *Ain Shams Engineering Journal*, 15(2), 102411.
- [3] Peng, D., & Yu, Z. (2022). A literature review of digital literacy over two decades. *Education Research International*, 2022(1), 2533413.

- [4] Spante, M., Hashemi, S. S., Lundin, M., & Algers, A. (2018). Digital competence and digital literacy in higher education research: Systematic review of concept use. *Cogent education*, 5(1), 1519143.
- [5] Farias-Gaytan, S., Aguaded, I., & Ramirez-Montoya, M. S. (2023). Digital transformation and digital literacy in the context of complexity within higher education institutions: a systematic literature review. *Humanities and Social Sciences Communications*, 10(1), 1-11.
- [6] Suparyati, A., Widiastuti, I., Saputro, I. N., & Pambudi, N. A. (2023). The role of artificial intelligence (AI) in vocational education. *JIPTEK: Jurnal Ilmiah Pendidikan Teknik dan Kejuruan*, 17(1).
- [7] Gligorea, I., Cioca, M., Oancea, R., Gorski, A. T., Gorski, H., & Tudorache, P. (2023). Adaptive learning using artificial intelligence in e-learning: A literature review. *Education Sciences*, 13(12), 1216.
- [8] Sholeh, M. I., & Syafi'i, A. (2024). Artificial Intelligence in Education: Transforming Assessment and Personalized Learning. *Journal of Education and Learning Sciences*, 4(1), 50-62.
- [9] Serrar, M., & Ibrahim, A. (2025). Digital Literacy, Circumscription, Evolution, and Its Relationship With Artificial Intelligence and Foreign Language Teaching. Supporting Personalized Learning and Students' Skill Development With AI, 305-328.
- [10] Zuo, Z., Luo, Y., Yan, S., & Jiang, L. (2025). From Perception to Practice: Artificial Intelligence as a Pathway to Enhancing Digital Literacy in Higher Education Teaching. *Systems*, 13(8), 664.
- [11] Hwang, H. S., Zhu, L. C., & Cui, Q. (2023). Development and Validation of a Digital Literacy Scale in the Artificial Intelligence Era for College Students. *KSII Transactions on Internet & Information Systems*, 17(8).
- [12] Yim, I. H. Y. (2024). A critical review of teaching and learning artificial intelligence (AI) literacy: Developing an intelligence-based AI literacy framework for primary school education. *Computers and Education: Artificial Intelligence*, 7, 100319.
- [13] Wu, D., & Zhang, J. (2025). Generative artificial intelligence in secondary education: Applications and effects on students' innovation skills and digital literacy. *PLoS One*, 20(5), e0323349.
- [14] Costa, P., & Joaquim, A. F. (2025). AI and Digital Literacy: Preparing Learners for a Technologically Advanced Sustainable Future. In *Rethinking Literacy in the Era of Sustainability and Artificial Intelligence* (pp. 73-98). IGI Global Scientific Publishing.
- [15] Topolnyk, Y., Gurevych, R., Debenko, I., Klochok, O., Cherniakova, Z., Yarova, A., & Maksymchuk, B. (2025). The Impact of Digital Technologies and AI on Adult Learning: From Digital Literacy to Neuroplasticity. *BRAIN. Broad Research in Artificial Intelligence and Neuroscience*, 16(2), 148-155.
- [16] Muzakki, Achmad, Rusdhianti Wuryaningrum, and Nanik Yuliati. "The Effect of

- Integrated Learning Management System with Augmented Reality and Artificial Intelligence on Critical Thinking Ability and Digital Literacy in Elementary Schools." *European Journal of Education and Pedagogy* 6.3 (2025): 22-28.
- [17] Kee, T., Kuys, B., & King, R. (2024). Generative artificial intelligence to enhance architecture education to develop digital literacy and holistic competency. *Journal of Artificial Intelligence in Architecture*, 3(1), 24-41.
- [18] Bircan, M. A., Şeref, İ., & Nacaroğlu, O. (2025). The effect of STEM themed story writing training with artificial intelligence tools on the digital literacy and 21 st century skills of preservice teachers. *Education and Information Technologies*, 1-20.
- [19] Chen, Zhaoyang, Zhongyi Xin, and Ningbo Wang. "Research on the Current Situation and Enhancement Strategies of Digital Literacy of Preschool Education Pre-service Teachers in the Era of Artificial Intelligence." 4th International Conference on Internet, Education and Information Technology (IEIT 2024). Atlantis Press, 2024.
- [20] Qian, L., Cao, W., & Chen, L. (2025). Influence of artificial intelligence on higher education reform and talent cultivation in the digital intelligence era. *Scientific Reports*, 15(1), 6047.
- [21] Zhang, Y. (2024). Research on the Multilingual Talent Cultivation System Empowered by AI under the New Liberal Arts Context. *Journal of Computer Technology and Electronic Research*, 1(2).
- [22] Kazanidis, I., & Pellas, N. (2024). Harnessing generative artificial intelligence for digital literacy innovation: A comparative study between early childhood education and computer science undergraduates. *AI*, 5(3), 1427-1445.
- [23] Pu, L., Liang, J., Wang, J., Zhang, N., & Zhong, W. (2024). Impact of AI-Based Learning, Digital Literacy, Information Stewardship on Learning Outcomes. *Profesional de la Información*, 33(5).
- [24] Joseph, A. A., Okechukwu, J. N., & Obilor, P. U. (2024). LECTURERS’DIGITAL LITERACY SKILLS AND APPLICATION OF ARTIFICIAL INTELLIGENCE AS PREDICTORS OF ONLINE LEARNING OUTCOMES AMONG UNDERGRADUATES IN FEDERAL UNIVERSITIES IN SOUTH-EAST, NIGERIA. *Journal of Association of Educational Management and Policy Practitioners*, 6(1), 337-350.
- [25] Rachbauer, T., Graup, J., & Rutter, E. (2025, March). Digital literacy and artificial intelligence literacy in teacher training. In *Forum for Education Studies* (Vol. 3, No. 1, pp. 1842-1842).
- [26] Şenkul, G., Kirkbeşoğlu, E., Ergüner, E., Serin, E. O., & Kocaoğlu, İ. (2025). Mediating Effect of Artificial Intelligence Attitude on the Relationship Between Digital Literacy and Career & Talent Development: Aligning with Quality Education-SDG4. *Journal of Lifestyle and SDGs Review*, 5(4), 05436-05436.
- [27] Wu, H., Fu, Y., Zhu, Z., & Chen, Y. (2024). Digital literacy competency status and cultivation countermeasures for college students in the age of digital intelligence.

International Journal of Education and Social Science Research.

- [28] Su, J., Ng, D. T. K., & Chu, S. K. W. (2023). Artificial intelligence (AI) literacy in early childhood education: The challenges and opportunities. *Computers and Education: Artificial Intelligence*, 4, 100124.
- [29] Fan, Y. U. A. N., & Jia, L. I. (2024). Opportunities Opportunities, Challenges Challenges, and Future Directions for Generative Artificial Intelligence in Library Information Literacy Education Education: A Scoping Review. *Journal of Library & Information Science in Agriculture*, 36(9).
- [30] CLN, O. O., & Obadoa, I. H. (2025). Artificial Intelligence Literacy, Digital Literacy, and Information Fluency in Academic Libraries in Nigeria: A Review. *Journal of Library and Information Science*, 4, 1.
- [31] Manash Esh & Saptarshi Ghosh. (2025). Tracing the trajectory of literacy warrants: A trends study on the emergence of digital literacy and digital competency. *Journal of Librarianship and Information Science*,57(3),746-761.
- [32] Xue Li,Lei Shen & Xiangfang Ren. (2025). Explore the Fashion Industry's Behavioral Intention to Use Artificial Intelligence Generated Content Tools Based on the UTAUT Model. *International Journal of Human-Computer Interaction*,41(16),10285-10300.