

# *Current Situation and Improvement of Secondary Vocational Students' Digital Literacy in China*

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**Keywords:** Digital Literacy; Secondary Vocational Students; Current Situation in China; Improvement

**Abstract:** The purpose of this study is to analyze the digital literacy of target students, explore the current situation of digital literacy of target students, and propose targeted improvement strategies. The subjects of this study were students from the secondary vocational college in China. The students were chosen at random. The research framework should be established on the basis of the research of scholars from different countries. Based on competency model theory and complexity theory, a questionnaire on digital literacy of secondary vocational students was compiled by using analytic hierarchy process and questionnaire survey. Combined with the digital performance evaluation of secondary vocational students, descriptive analysis, difference analysis and correlation analysis are carried out on the data collected by the questionnaire. Finally, according to the conclusions of the research, this paper puts forward recommendations on improving the digital literacy of secondary vocational students.

## 1. Introduction

In the 21st century, development of informatization and digitization has led to the deep integration of information technology and industry, which has set new requirements for the talents and changed the structure and scale of talent demand in the labor market. All the countries, especially the countries with more advanced information technology, are devoting to cultivating citizens with high digital literacy and developing their digital literacy to advance economic and social development. China is a developing country that is pursuing the continuous development of digitalization. Although Chinese secondary vocational students have certain digital literacy, they need to improve their innovative digital literacy, as well as maintain their positive attitude towards safety and value.

Through in-depth research on the digital literacy of secondary vocational students, the author found out the correlation between the evaluation of the dimension of digital literacy and students' achievement according to the recent digital literacy evaluation of students, and then put forward corresponding strategies to improve students' digital literacy. This would facilitate the training of people in new digital technologies.

## 2. Literature Review

The concept of digital literacy was first proposed by Professor Yoram Eshet Alkalai of the Open University of Israel in 1994 and brought into China in 2006. Chinese Cyberspace Administration defined it as a collection of a series of literacies and abilities that citizens in the digital society should possess in their learning, work, and life<sup>[1]</sup>. EU listed digital literacy as one of the eight core qualities of European citizens and has launched the continuously updated DigComp as a digital competency framework to help European citizens understand and improve digital literacy<sup>[2]</sup>. The American Library Association<sup>[3]</sup> emphasizes the importance of digital literacy education. Digital literacy education should not be limited to secondary vocational education but should extend to lifelong learning. The concept of lifelong learning is crucial for continuous skill development. Wang Q.<sup>[4]</sup> emphasized the vital link between digital literacy and the employability of vocational education graduates. He thought one prevailing viewpoint is that digital literacy is a critical factor in shaping the employability of secondary vocational students in China. The digital age has transformed the job market, and many industries now require employees to possess digital skills. Bingimlas K. A.<sup>[5]</sup> has discussed the challenges of integrating digital technology into education. He believed to enhance the digital literacy of secondary vocational students in China, it is essential to integrate digital literacy education into the curriculum. Digital literacy education should not be confined to standalone courses; instead, it should be interdisciplinary and closely connected to various vocational fields. Xu and Shang<sup>[6]</sup> comprehensively compared the development models of digital literacy in the US, Europe, and Japan from a horizontal perspective, and proposed constructive suggestions for improving digital literacy education in China. Ping Y.<sup>[7]</sup> extracted four dimensions from the digital literacy of college students, namely digital attitude, digital thinking, digital knowledge, and digital skills. Liu Q.<sup>[8]</sup> integrated college students' characteristics into EU's DigComp 2.1 to form a digital literacy framework for Chinese college students, including 5 dimensions and 15 secondary indicators.

In conclusion, the improvement of digital literacy among secondary vocational students in China is a multifaceted challenge with significant implications for their future employability and success. Integrating digital literacy education, enhancing teacher digital literacy, creating digital learning environments, emphasizing lifelong learning, and addressing digital inequality are key strategies to ensure that these students are well-prepared for the digital age. By considering these viewpoints and leveraging the methods from the mentioned references, the author carries out a research on Chinese secondary vocational students' digital literacy and puts forward corresponding suggestions.

## 3. Methodology

### 3.1 Research Design

This study used quantitative method to scientifically research and analyze the data collected from respondents. The questionnaire collected information from the profile of the respondents in terms of sex, grade level, and major, as well as the assessment of the respondents on dimensions of the secondary vocational students' digital literacy, in terms of digital science knowledge, digital application ability, digital competitiveness, digital ethical values and digital personality traits. The researcher further analyze and study the current situation of secondary vocational students' digital literacy in order to propose corresponding improvement strategies.

### 3.2 Sampling Technique

The research object of this study is secondary vocational students from two representative

vocational schools in Jiangsu Province in China. The research object is obtained through random sampling. Using Qualtrics, the total student sample from the population of 3056, the obtained sample at 5% margin of error should be 342. In this study, 345 vocational students from 2 vocational schools took part in the survey. The student respondents selected for this study must meet the following criteria: having a formal identity; and having at least half a year of learning experience in vocational schools. Sampling is the process of selecting several (samples) from a larger population (population), which will serve as the basis for calculating or predicting the frequency of unrecognized information or results about the population.

### 3.3 Data Gathering Procedure

The data of this study were collected by selecting 2 representative secondary vocational schools. Before conducting the survey, the researchers completed all ethical reviews. Respondents were well aware that the study was for academic purposes only. They have the right to withdraw from the investigation at any time, and their security and privacy will be respected. The questionnaire as a survey tool will be piloted on a small sample of participants prior to the actual collection of data to assess the clarity and validity of the questionnaire and to make necessary adjustments to improve its reliability and validity.

### 3.4 Analysis and Interpretation of Data

#### 3.4.1 Profile of the Respondents

Table 1 presents the frequency distribution of the Program participant respondents' profile in terms of Sex, Major and Grade Level.

Table 1: Distribution of Respondents by Sex, Major and Grade Level

Profile	Indicator	Frequency	Percentage
Sex	Male	175	51.0
	Female	170	49.0
Total		345	100.0
Major	Liberal Arts	151	44.0
	Science and Engineering	194	56.0
Total		345	100.0
Grade Level	Grade 1	124	36.0
	Grade 2	121	35.0
	Grade 3	100	29.0
Total		345	100.0

Table 1 shows the proportion of Program participant is 345. In terms of sex there are 175 or 51% males. In terms of major, there are 194 or 56% are into Science and Engineering, while 44% make up those in Liberal Arts. A survey of the table showed an almost equal distribution, where 36% are those in the Freshmen, while close second are in Grade 2, with 35% and the least are those in Grade 3 with a 29% of the samples covered for the study.

#### 3.4.2 Assessment of the respondents on dimensions of the secondary vocational students' digital literacy

As shown in Table 2, in a holistic assessment, the Average Composite Mean of respondents' evaluations regarding the extent of effects on the Dimension of the Secondary Vocational Students' Digital Literacy is calculated as 2.74. This score indicates that program student participants perceive the impacts of the plan across the five aspects to be of Low Extent.

Table 2: Overall Assessment on the Dimension of the Secondary Vocational Students' Digital Literacy

Variables	Program Participant				
	Mean	SD	Rank	QD	Int.
Digital Knowledge	2.64	0.70	4	A	HE
Digital Application Ability	2.75	0.71	3	A	HE
Digital Competitiveness	2.47	0.81	5	A	HE
Digital Values	2.93	0.72	1.5	A	HE
Digital Personality Traits	2.93	0.70	1.5	A	HE
Composite Mean	2.74	0.73		A	HE

Program participants, as a whole, hold the view that all five dimensions - Digital Knowledge (2.64), Digital Application Ability (2.75), Digital Competitiveness (2.47), and both Digital Values and Digital Personality Traits (2.93) - reach the level of High Extent. The Composite Mean for these dimensions collectively is 2.74. Within this, the dimension of both Digital Values and Digital Personality Traits garners the highest average value (2.93), whereas Digital Competitiveness receives the comparatively lower average score (2.47).

Table 2 indicated that the students who participated in the study has yet to explore and cultivate their digital literacy to the fullest, especially in digital competitiveness. The result may not be so great as we expected it judging from, Liu Q.8 who stated that digital literacy has become one of the necessary skills for learners in the digital era, and it should be deeply understood from both practical and critical aspects. However a little has researched about its importance.

### 3.4.3 Respondents' Assessment of their Performance based on the Recent Digital Evaluation Result

Table 3: Student's Performance based on the Recent Digital Evaluation Result

Score	Frequency	Percentage	Interpretation	Rank
0 – 59	5	1.0	Failed	5
60 – 69	43	12.0	Poor Performance	4
70 – 79	96	28.0	Moderate Performance	2
80 – 89	130	38.0	Good Performance	1
90 – 100	71	21.0	Excellent Performance	3
Total	345	100.0	--	--

Table 3 shows the performances of the respondents in the recent digital evaluation results revealed that 38% of respondents got a "good performance" and 28% got a "moderate performance". Moreover, the respondents who got an "excellent performance" was evident on the third rank and composed of 21% of the students who really made a good result of the evaluation conducted by committee of digital teachers designated by the school. About 12 percent of the students on the table showed "low performance." This is a negligible number or 1% who "Failed Performance" in a recently concluded digital evaluation given periodically by the school. Zimmerman, B. J.<sup>[9]</sup> did a similar study in Self-regulated learning and academic achievement: Theoretical perspectives, and he argued that digital assessment can improve self-cognition and learning motivation.

Martin, A.<sup>[10]</sup> concluded in the study that digital literacy assessment should comprehensively consider multiple dimensions, including technical skills, information literacy and critical thinking.

## 4. Conclusions and recommendations

### 4.1 Conclusions

Based on the findings of the study, the following conclusions are hereby drawn:

- 1) It can be inferred that the students utilized for this study are in better position to assess their

digital literacy knowledge because of the appropriateness of their personal circumstances, namely, their sex, grade level and major.

2) The objective assessment of the digital literacy among the respondents are borne out of basic skills employed which are yet to be cultivated. Navigating various dimensions of digital literacy are yet to be extensively and deeply applied.

3) The students' profile such as sex, major are factors for consideration in assessing digital literacy.

4) It can be inferred that students who performed better in school are those who manifested high digital ability. Their performance are reflective of lessons learned and direct application of the skills and knowledge in digital areas. The process indicated in the study are congruent with the competency testing of the theory in calculating ones' performance.

## 4.2 Recommendations

Based on the findings and conclusions drawn, the following are hereby recommended:

1) It is recommended that more exposure of students on the skill development and application should be equally provided to all students regardless of their sex, grade level and major. This was evident in the findings of the current study.

2) Students must also be given more opportunity for competitive situation to test their mettle in digital ability, in this manner they could be motivated to take more serious stance in using digital knowledge in skills for cultivating their knowledge and skills academically, not for gamification.

3) School should support every effort expended by the digital teachers of the schools for creativity and innovation in the field of technology.

4) School should arrange for more teacher training and development since self efficacy has a tendency to be modelled among students.

5) School should emphasize Lifelong Learning. Digital literacy education should not be confined to the duration of secondary vocational education. Students should be encouraged to adopt a lifelong learning mindset. They should continue to update and expand their digital skills throughout their careers to stay relevant in an ever-evolving digital landscape.

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