

The States and Students Needs for Digital Literacy Skill of Sichuan University of Arts and Science

**Hu Hanyue,
Wichian Intarasompun and Nuttamon Punchatree**
Bansomdejchaopraya Rajabhat University, Thailand
Corresponding Author , Email: 2917178817@qq.com

Abstract

The objectives of this research were: to study the current situation of digital literacy skill of students in Sichuan University of Arts and Sciences, to study students' needs in digital literacy and explore effective training programs to improve learners' digital literacy. This study reflects the questionnaire survey method and uses the actual survey results to accurately reflect the specific situation of students in Sichuan University of Arts and Sciences in digital literacy. The sample group of this study is 375 students from Sichuan University of Arts and Sciences. Statistics used to analyze the data include percentages, averages, and standard deviations.

The results of findings were as follows: the current situation of digital literacy skill of students in Sichuan University of Arts and Sciences. Sichuan University of Arts and Sciences students have a high overall level of demand for digital literacy and the exploration of effective training programs.

Keywords: The States and Students; Needs for Digital Literacy Skill; Sichuan University

Introduction

As early as 2006, the European Union took the lead in making digital literacy one of the eight core qualities, implemented the "Digital Literacy Project" in 2011, and built a digital literacy framework (Long Yun & Yao Jinhong, 2023, p,19). Subsequently, from 2015 to 2017, the New Media Alliance Horizon Report (Higher Education Edition) predicted that digital literacy would become one of the important challenges in the future for three consecutive years. In 2018, UNESCO released the "Digital Literacy Framework" report and gave relevant recommendations to guide countries in developing digital literacy (Gu Xuan & Song Shijun, 2023, p,214). College students, as one of the main forces in the era of digital innovation, digital literacy must be the necessary survival skills for their integration into the society.

Technology enabling education puts forward new requirements for college students. In the era of digital learning with information explosion, ubiquitous learning methods are gradually changing the "learning" of learners. Redundant and fragmented knowledge contents affect learners' judgment of information and the construction of their own knowledge learning system. Traditional linear knowledge presentation and learning methods make learners in a passive state of acceptance in the digital environment, which is not conducive to their own development and future learning needs(Li Honglin, 2022, p,15). Based on this, it is more important for learners to know where the knowledge is than to master the knowledge itself, so as to meet the needs of digital learning and the cultivation goal of thinking ability.

The concept of digital literacy can be defined in a broad and narrow sense. In the narrow sense, digital literacy focuses on digital skills in the application of digital devices, software and other technical tools. Gao Xinfeng (2023) regards digital literacy as the ability to skillfully, innovatively and safely use various digital tools and digital technologies in work, study and life(p,38). Digital literacy in a broad sense is formed through the evolution of media literacy, computer literacy, information literacy and network literacy. It includes the skills of media literacy in the digital context, and has common elements with information literacy in identifying, acquiring, evaluating, integrating, applying, understanding, producing, collaborating and sharing information. Zhang Rani (2023) also points out that digital literacy refers to the relevant knowledge, skills, experiences, values and attitudes that individuals need to survive in the entire digital environment(p,46). However, Chinese scholars believe that digital literacy contains technical and humanistic connotations. At the technical level, digital literacy reflects the knowledge reserves and operational skills possessed by individuals using digital systems to handle affairs. At the humanistic level, Huang Ruhua & Feng Jie (2023) pointed out that digital literacy reflects an individual's mental process and mental state when using digital technology(p,1). Wang Zhaoxuan(2023) pointed out that digital literacy and skills are a collection of a series of qualities and abilities that citizens in digital society should have in their learning, work and life, such as digital acquisition, production, use, evaluation, interaction, sharing, innovation, security, ethics and so on(p,29).

This study adopts the questionnaire survey and uses the actual survey results to accurately reflect the specific situation of students in Sichuan University of Arts and Sciences in terms of digital literacy, and proposes corresponding strategies to improve college students' digital literacy based on the results of the actual survey, which can provide practical guidance for the implementation of digital literacy education in Chinese universities.

Research Objectives

1. To study the current situation of digital literacy skill of students in Sichuan University of Arts and Sciences.
2. To study students' needs in digital literacy and explore effective training programs to improve learners' digital literacy.

Research Methodology

Study area selection

This study defines the scope of the question as the digital skills literacy of students in Sichuan University of Arts and Sciences. The respondents of this study are students of Sichuan University of Arts and Sciences.

Population and sample

Population

Sichuan University of Arts and Sciences has a total of 15,618 students from Grade 1 to Grade 4 in 2023. The first grade had 4,259 students; There are 4,332 in the second grade; 3,525 students in the third grade; There are 3,502 students in the fourth grade.

The Sample Group

According to the known population sample size determination table (Krejcie & Morgan 1970), 375 students were randomly selected from 15618 students in Sichuan University of Arts and Sciences. In this survey, 375 students were randomly distributed by

Sichuan University of Arts and Sciences, and 375 students were recovered, with a recovery rate of 100 percent, of which 375 were valid, with an effective rate of 100 percentages.

Data Collection

First, according to the guidelines of Sichuan University of Arts and Sciences, the samples participating in the research project were explained, and the questionnaire was submitted for approval.

Secondly, in July 2023, August 2023, the researcher distributed the questionnaire on digital literacy skills of students in Sichuan University of Arts and Sciences through the online survey tool "Questionnaire network" and collected the questionnaire. Thirdly, since the importance of research was emphasized when the questionnaire was issued to attract students' attention, 375 questionnaires were issued and 375 valid questionnaires were collected, with a recovery rate of 100 percentages.

Data analysis

This study adopts the current data of students' digital skills literacy in Sichuan University of Arts and Sciences, and adopts package program to analyze the data as follows:

Step 1: The personal information of the respondents is analyzed according to the number and percentage, and classified according to gender, grade, faculty and have digital skills equipment the classification.

Step 2: Using the mean value method and standard deviation method to Sichuan University of Arts and Science students' digital skills literacy Information skills, Digital tools usage Skills, Digital transformation skills, students' Motivation.

The researchers proposed a hierarchical classification of data analysis results to understand each other when providing the following information:

Mean score 4.50-5.00 refers to Excellent skill.

Mean score 3.50-4.49 refers to good skill.

Mean score 2.50-3.49 refers to average skill.

Mean score 1.50-2.49 refers to poor skill.

Mean score 1.00-1.49 refers to poorest skill

Research Results

Part 1 : The current situation of digital literacy skill of students in Sichuan University of Arts and Sciences data. Using the mean value method and standard deviation method to Sichuan University of Arts and Science students' digital skills literacy Information skills, Digital tools usage Skills, Digital transformation skills. The respondents' general data is shown as table 1.

Table 1. Frequency and percentage of respondents' general data

(n=375)

Item	Frequency	Percentage
1. Students' gender		
1.1 Male	189	50.40
1.2 female	186	49.60
Total	375	100.00

2. Students' grade			
2.1 Sophomore year	123	32.80	
2.2 Junior year	132	35.20	
2.3 Senior	120	32.00	
Total	375	100.00	
3. Students' faculty			
3.1 Program of Literature and Communication	91	24.30	
3.2 Program of Marxism	59	15.70	
3.2 Program of Political Science and Law	41	10.90	
3.3 Program of Foreign Languages	65	17.30	
3.4 Program of Teacher Education	54	14.40	
3.5 Program of Finance and Management	32	8.50	
3.6 Program of Mathematics	33	8.80	
Total	375	100.00	

According to Table 1, of the 375 respondents, most of them are 189 male students, according for 35.20 percentages ,132 students majored in junior year, according for 35.20 percentages , 91 students majored in Program of Literature and Communication, according for 24.30percentages.

The current situation of digital literacy skill of students in Sichuan University of Arts and Sciences data. Using the mean value method and standard deviation method to Sichuan University of Arts and Science students' digital skills literacy Information skills, Digital tools usage Skills, Digital transformation skills. is shown as table 2-5

Tabel 2. The average and standard deviation of digital skills literacy of students in Sichuan University of Arts and Sciences are analyzed from three aspects

Current situation of digital skills literacy of students in Sichuan University of Arts and Sciences	\bar{x}	SD	Level	order
1. Information skills	4.51	0.83	Excellent skill	1
2. Digital tools usage Skills	4.34	0.84	good skill	2
3. Digital transformation skills	4.32	0.76	good skill	3
Total	4.32	0.69	good skill	

As can be seen from Table 2., the status quo of digital skills literacy in the four aspects is at a The good skill level ($\bar{x}=4.32$). Considering the results of this study, Excellent skill level is Information skills($\bar{x}=4.51$), followed by Digital tools usage Skills($\bar{x}= 4.34$),on the contrary, the lowest level is Digital transformation skills ($\bar{x}=4.32$).

Table 3. The mean and standard deviation of information skills of liberal arts students in Sichuan Province

	Information skills	\bar{x}	SD	Level	order
1	Able to share files on the internet	4.22	0.44	Good skill	15
2	Always examine the accuracy of information before using	4.63	0.43	Excellent skill	5
3	Always evaluate data before sharing it on the internet	4.62	0.62	Excellent skill	6
4	Consider consequences before giving opinions on social media	4.25	0.83	Good skill	13
5	Evaluate the reliability of information sources before application	4.57	0.32	Excellent skill	7
6	Able to define keyword in order to search for expected information	4.23	0.43	Good skill	14
7	Select appropriate data for solving problems	4.52	0.48	Excellent skill	9
8	Indicate frameworks in order to make the search more efficient	4.63	0.61	Excellent skill	3
9	Define information sources that match expected information	4.56	0.82	Excellent skill	8
10	Able to distinguish facts and opinions	4.77	0.42	Excellent skill	1
11	Able to analyse and synthesise information gathered from various sources	4.26	0.43	Good skill	12
12	Able to categorize related information	4.75	0.72	Excellent skill	2
13	Able to integrate knowledge in order to create new knowledge	4.35	0.74	Good skill	11
14	Understand information management by applying Metadata	4.63	0.57	Excellent skill	4
Total		4.51	0.83	Excellent skill	10

From Table3., the overall level of information skills of students in Sichuan University of Arts and Sciences is Excellent skill ($\bar{x}=4.51$, $SD=0.83$).

In the survey of information skills, the Excellent skill ordering of students' mastery of information skills is "Able to categorize facts and opinions" ($\bar{x}=4.77$, $SD=0.42$), followed by "Able to categorize related information" ($\bar{x}=4.75$, $SD=0.72$). The lowest ordering was "Able to define keyword in order to search for expected information" ($\bar{x}=4.23$, $SD=0.43$).

Table 4. The mean and standard deviation of Digital tools usage Skills of liberal arts students in Sichuan Province

(n=375)					
Digital tools usage Skills		\bar{x}	SD	Level	Order
1	Use social media as the usual medium to communicate with other people.	4.53	0.54	Excellent skill	6
2	Always adapt technology to everyday life.	4.32	0.40	Good skill	11
3	Capable of selecting an optimal social medium to communicate in different situations.	4.84	0.32	Excellent skill	1
4	Concern about other people's privacy when communicating through social media.	4.21	0.54	Good skill	13
5	Aware of the advantages, disadvantages and impact of using the internet.	4.43	0.32	Good skill	10
6	Understand ethics in using the internet and cyber bullying.	4.64	0.52	Excellent skill	4
7	Well-adjusted in learning new technologies.	4.52	0.42	Excellent skill	7
8	Find tools and applications in order to support everyday life.	4.83	0.64	Excellent skill	2
9	Aware of the methods used to protect personal data on the internet.	4.56	0.42	Excellent skill	5
10	Able to organize collected data on a personal computer.	4.67	0.56	Excellent skill	3
11	Able to self-teach in order to use applied programs?	4.46	0.53	Good skill	8
12	Able to self-teach in order to study a special function of different programs.	4.45	0.63	Good skill	9
13	Able to fix technical problems on a computer system.	4.31	0.82	Good skill	12
Total		4.34	0.84	Good skill	

As can be seen from Table 4, students in Sichuan University of Digital tools usage Skills is good skill ($\bar{x}=4.338$, $SD=0.84$).

In the survey of Digital tools usage Skills ,ordering of students' mastery of Digital tools usage Skills is "Capable of selecting an optimal social medium to communicate in different situations" ($\bar{x}=4.84$, $SD=0.32$). Followed by "Find tools and applications in order to support everyday life" ($\bar{x}=4.83$, $SD=0.64$). The lowest ordering was " Concern about other people's privacy when communicating through social media" ($\bar{x}=4.21$, $SD=0.54$).

Table 5. The mean and standard deviation of Digital transformation skills

Digital transformation skills		\bar{x}	SD	Level	Order
1	Aware when using others' work without owners' permission.	4.65	0.74	Excellent skill	4
2	Understand plagiarism.	4.31	0.63	Good skill	9
3	Create video media to use in a presentation.	4.86	0.84	Excellent skill	2
4	Aware that the videos they have designed are copyrighted?	4.44	0.31	Good skill	7
5	Able to share works designed by each other with their friends on the internet.	4.24	0.53	Good skill	10
6	Understand the Creative Commons concerning their published works on the internet.	4.74	0.35	Excellent skill	3
7	Able to create new content with the tools on the internet.	4.57	0.59	Excellent skill	5
8	Capable of transforming forms of information in order to serve different purposes.	4.31	0.72	Good skill	8
9	Understand how to paraphrase in academic writing.	4.46	0.53	Excellent skill	6
10	Able to create new content by themselves and avoid plagiarism.	4.87	0.53	Excellent skill	1
Total		4.32	0.76	Good skill	

From Table 5, the overall level of Digital transformation skills of students in Sichuan University of Arts and Sciences is The good skill ($\bar{x}=4.32$, $SD=0.76$).

In the survey of Digital transformation skills, the Excellent skill ordering of students' mastery of information skills is " Able to create new content by themselves and avoid plagiarism " ($\bar{x}=4.87$, $SD=0.53$), followed by " Create video media to use in a presentation " ($\bar{x}=4.86$, $SD=0.84$). The lowest ordering was " Able to share works designed by each other with their friends on the internet" ($\bar{x}=4.24$, $SD=0.53$).

Part 2: The Data analyze on analyze students' need in digital literacy and explore effective training programs to improve learners' digital literacy

Table 6. Descriptive analysis of students' need in digital literacy and explore effective training programs

students' need in digital literacy and explore effective training programs		\bar{x}	SD	Level	Order
1	Students would like to participate in training courses.	4.03	0.24	Good skill	3
2	Students would like to be involved in courses included in the curriculum of the specialty?	4.12	0.45	Good skill	2
3	Students would like to be involved in specialized courses outside the specialty curriculum.	4.21	0.42	Good skill	1
Total		4.12	0.32	Good skill	

From Table 6, the overall level of students' need in digital literacy and explore effective training programs of students in Sichuan University of Arts and Sciences is The good skill ($\bar{x}=4.12$, SD=0.32).

In the survey of students' need in digital literacy and explore effective training programs, ordering of students' mastery of information skills is " Students would like to be involved in specialized courses outside the specialty curriculum " ($\bar{x}=4.21$, SD=0.42), followed by " Students would like to be involved in courses included in the curriculum of the specialty " ($\bar{x}=4.12$, SD=0.45). The lowest ordering was " Students would like to participate in training courses" ($\bar{x}=4.03$, SD=0.24).

Table 7. The frequency and percentage of courses that students want to study outside their major

courses	Frequency	Percentage
1. Calculus	23	6.10
2. Linear algebra	78	20.80
3. Statistics and probability	42	11.20
4. Quantum computer science	13	3.50
5. Introduction to Programming (C/C+)	103	27.50
6. Algorithm design	16	4.30
7. Artificial Intelligence: Principles and techniques	58	15.50
8. Other	42	11.20

As can be seen from the above table, the number of people who choose Introduction to Programming (C/C+) is the largest, accounting for 27.5 percent , while the number of people who choose Quantum computer science is the least, accounting for 3.5 percent.

Table 8. The frequency and percentage of student need to have more Digital literary equipment/Tools / Instrument in university

Digital literary equipment/Tools / Instrument in university	Frequency	Percentage
1. Notebooks borrow.		
A: Yes	212	56.53
B: No	163	43.47
2. Computer laboratory room	189	186.00
3. Computer access	211	164.00
4. Internet access	294	81.00
5. Free WIFI access point	301	74.00
9. Access points strength or weak	283	92.00
10. Area to install more Wi-Fi access point	273	102.00

It can be seen from the above table that the number of people who think that more Free WIFI access points, accounting for 74 percent, while the number of people who choose no Notebook borrow is the least, accounting for 43.47 percent.

Table 9. The frequency and percentage of student intrinsic need to learn influenced by the following factors.

Factors influence intrinsic need	Frequency	Percentage
1. Ideal situation	110	29.30
2. Ambition level	72	19.20
3. Own needs	45	12.00
4. Goal structure	83	22.10
5. Character	26	6.90
6. Interest	24	6.40
7. Will quality	15	4.00

As can be seen from the above table, the number of Ideal situation for the most, accounting for 29.30 percent, while the number of people who choose Will quality is the least, accounting for 4 percent.

Table 10. The frequency and percentage of student external need to learn influenced by any of the following factors.

Factors influence external need	Frequency	Percentage
1. School	209	55.70
2. Family	66	17.60
3. Society	100	26.70

As can be seen from the above table, the number of people who think that the external motivation of learning is influenced by school accounts for the most, the number of people who think that the external need of learning is influenced by family, accounts for 17.6 percent.

Conclusion

According to the research States and Students' needs for Digital Literacy Skill of Sichuan University of Arts and Science, The results are summarized as follows:

1. The current situation of digital literacy skill of students in Sichuan University of Arts and Sciences. The status quo of digital skills literacy in the four aspects is at a The good skill level. The Excellent skill level is Information skills, followed by Digital tools usage Skills, on the contrary, the lowest level is Digital transformation skills.

2. To study students' needs in digital literacy and explore effective training programs to improve learners' digital literacy.

2.1 The overall level of students' need in digital literacy and explore effective training programs of students in Sichuan University of Arts and Sciences is The good skill. Students' need in digital literacy and explore effective training programs, the Excellent skill ordering of students' mastery of information skills is " Students would like to be involved in specialized courses outside the specialty curriculum ". The lowest ordering was " Students would like to participate in training courses".

2.2 In Courses that students want to study outside their major, the number of people who choose Introduction to Programming (C/C+) is the largest.

2.3 Student need to have more WIFI access point.

2.4 Student intrinsic need to learn influenced by Ideal situation for the most.

2.5 Student external need to learn influenced by think that the external motivation of learning is influenced by school accounts for the most.

Discussion

Students would like to be involved in specialized courses outside the specialty curriculum

This view is consistent with the research of scholars Wu Yingqiang & Shi Leyi (2023).It is a good programs to set up courses other than professional courses for students to cultivate students' digital skills literacy. Here are some suggested courses to help students improve their digital skills literacy:

1. Data Analysis and Visualization: This course can teach students to use common data analysis tools and software such as Excel, Python, or R, as well as data visualization tools

such as Tableau or Power BI. Students can learn how to process and analyze data and visualize it to help them make effective decisions.

2. Programming Basics: Provide students with an entry-level programming course, such as Python or JavaScript. This will help students develop programming thinking and problem-solving skills, and lay the foundation for their future application of programming knowledge in a digital work environment.

3. Cyber Security and Privacy: This course can teach students how to protect personal information and cyber security. Students learn how to identify and respond to cyber threats and understand the basic principles and best practices of cyber security.

These are some curriculum suggestions for students to develop digital skills literacy. According to the situation of the Sichuan University of Arts and Sciences and the needs of the students, it can be adjusted and combined according to the specific situation.

Set course of Programming (C/C+)

This view is consistent with the findings of scholars Zhou Haitao & Zhu Yuanjia (2023). Set up Programming (C/C+) curriculum, in this stage, teachers need to use a variety of forms to organize and implement. For example: in class through multimedia display of related software, videos, etc.; After class, use network resources to download tools to watch and learn online; Using the existing conditions and teachers of the school as the basis to build a laboratory platform and carry out practical training, etc., to meet the needs of students for the improvement of digital literacy skills.

Set more Free WIFI access point

This view is different from the research results of most scholars. Most universities have more WiFi access points. In order to cultivate college students' digital skills, free wireless access points should be established to some extent, so that students can get more information about study and work. Schools should set up different types and levels of resources required for use according to the needs of students. For example: universities can set up free wireless Internet access mobile learning platform in spare time; Or provide wireless network access services and other related functions to attract more users to download and learn, which can not only effectively save costs, but also improve teaching efficiency and quality, but also improve students' interest and enthusiasm for the application of digital skills. For students, it can shorten their learning time, increase their knowledge reserve and improve their information literacy, which plays a very important role; On the other hand, it can also provide more resources for the school to attract graduates to study or find employment in the school, and select those students who are interested in themselves and have the ability to join the school for work and further study. At the same time, the course system and learning content of college students can be further improved through feedback on the application of digital skills in teaching.

Stimulate students' Ideal situation and improve their inner needs

This view is consistent with the findings of scholars Zhou Yilong & Kong Zhuoyu (2023). In the application of digital technology, college students can learn through digital skills to achieve the purpose of improving their own quality, cultivating interests, and improving internal needs. Therefore, according to the actual situation of students, teachers can choose a The good skiller level suitable for their development and needs and in line with the current stage of teaching objectives and requirements. In addition, we should also pay attention to guiding students to establish correct values, outlook on life and other concepts; At the same time, usually pay more attention to college students' mental health, interpersonal skills and other problems, timely help.

Reduce school as an external demand that affects students' learning

Schools should pay attention to the cultivation of digital skills, improve students' learning and innovation ability in applying information technology, and provide a strong guarantee for the future development of college students. Colleges and universities should strengthen the reform of computer courses and improve the teaching quality. In the teaching process, we should actively explore, introduce advanced teaching equipment, enrich teaching content, and improve the level of information management; At the same time, the use of digital resources to build the campus, for the future development of college students to create good conditions and opportunities. First of all, schools should strengthen the cultivation of students' mathematical ability and actively organize students to participate in various forms of mathematical learning. Such as: using the winter and summer vacation time, to carry out simulated situation teaching competitions, hold online competitions, etc. Secondly, increase the investment, strengthen the construction of campus network, improve the level of hardware facilities; The second is to use multimedia means to disseminate information resources to college students, making them more convenient and quicker to use, so as to attract them to master the knowledge needed in effective digital skills training courses, but also to provide students with rich practical opportunities.

Recommendation

Suggestions on the application of research results

In this study, the researchers' suggestions on the application of research results are as follows:

According to the research results of the fourth chapter on the current situation of students' digital literacy in Sichuan University of Arts and Sciences, firstly, schools should increase the audience of digital literacy training and expand the educational channels; Second, develop students' digital conversion skills through the curriculum; Thirdly, focus on the cultivation of students' ability of information retrieval and keyword definition; Fourth, increase the education of students concerned about others' privacy on the Internet; Fifth, Guide students to use the Internet to share their work and design.

The effective improvement of students' digital literacy needs can be started from the following aspects: First, appropriately increase the number of professional courses other than professional courses and reduce the number of relevant training courses; Second, increased professional courses can be choose Introduction to Programming (C/C+); Third, set up more WIFI access points; Fourth, pay attention to students' internal learning motivation, cultivate students' ideals and beliefs, and fifth, reduce the influence of school on students' external learning motivation.

Future Researches

1. The current situation of digital skills literacy in other universities or institutions should be studied in the future to enrich the research results.

2. The impact of digital learning on education or life should be deeply studied in the future, which is conducive to facing the current unpredictable digital environment.

3. In the future, we should study the teaching methods of students' digital skills training, actively coordinate high-tech enterprises to participate in the design and development of corresponding digital skills courses, and strengthen the development of digital skills teaching materials.

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