

# A Study of Enhancing University Students' Information Literacy and Global Communicative Competence

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**Abstract**—This paper describes a 12-month study investigating the feasibility of designing a cooperative learning project which provided opportunities to embed the concepts of information literacy and global communication into the university curriculum. Bridging two courses from different disciplines, the learning project under study was a platform for both postgraduate students and undergraduate students to exchange research ideas and share cultural information. Data included mainly course materials, student presentations, interviews, and a questionnaire survey. Analysis of the data shows that the learning project was innovative and effective in enhancing students' information literacy and global communicative competence. Moreover, a tendency was identified in the students' project presentations, i.e., the integration of the Chinese view of harmony and the international view of unity.

**Keywords**—language, culture, learning project, information literacy, global communicative competence

## I. INTRODUCTION

In the past two decades, the development of emerging technological concepts such as mobile Internet, cloud computing, big data, smart home, artificial intelligence, etc. has great impact on people's work and life. In the field of education, new information technologies including social network platforms, online courses, micro courses, MOOC, and e-books are constantly integrated with various traditional teaching modes, making Internet Plus education develop rapidly. Thus, the combination of education and traditional teaching methods in an information-based environment makes teaching methods more integrated and flexible. The location of teaching is no longer limited to classroom walls and the diversity of interactive methods and the richness of teaching information can all improve the quality of teaching.

The researcher conducted a review of the relevant literature on CNKI and found that the concept of information was first introduced about twenty years ago in 2004. As can be seen in Fig. 1, 459 journal papers have been published on CNKI since 2004, among which 200

articles have at least one citation. The year with the highest number of published papers was 2007.

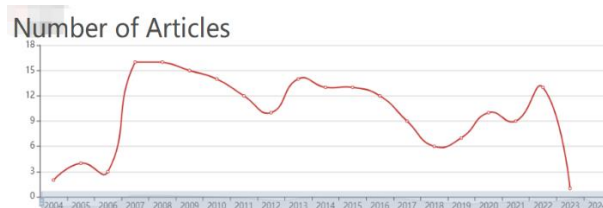


Fig. 1. Number of published papers on information literacy on CNKI (2004–2023).

After 2010, the investigation of information literacy was integrated with the study of the concepts in other fields, e.g., culture, global communication, academic integrity, and digital literacy (Figs. 2 and 3). Moreover, an increasing number of interdisciplinary studies have been found exploring the development of university students' information literacy and global communicative competence. For example, Chen and Yang [1] proposed the standards of evaluation university students' information literacy. Ma, Ding, and Li [2] studied the current situation of university students' information literacy in Wuhan area based on large-scale statistical data and provided suggestions of information literacy education in universities. In a recent investigation, Zhu, Chen, and Gou [3] conducted a questionnaire survey and identified the influence degree of user information literacy level in the information dilemma.

Although much has been done regarding the strategies of developing university students' information literacy, little has been found as to how the concepts of information literacy, culture, and global communication are integrated and imbedded in the curriculum, let alone the design and practice of pertinent learning projects.

Guided by the theory of Language Socialization and the views of ecolinguistics [4–6], this study explored the feasibility of a cooperative learning project in two courses based on the Product-Oriented Approach [7] and its effects on the development of student's information literacy and global communicative competence. According to Ref. [5], learners are socialized in a community of practice. In this respect, the concept of identity/role serves to better understand the power

relations underlying any learning situation [4]. Wu [8] defines informational teaching as “a new teaching system which is guided by modern teaching and learning concepts and supported by information technology and applies modern teaching methods... It contains four core elements: teaching resources, teaching design, information platform, information policies and standards” (translated by the author).

There are two research questions in this study:

- How are language, culture and information incorporated into the curriculum under study?
- What are the effects of the innovative teaching design and practice on the development of students’ information literacy and global communicative competence?

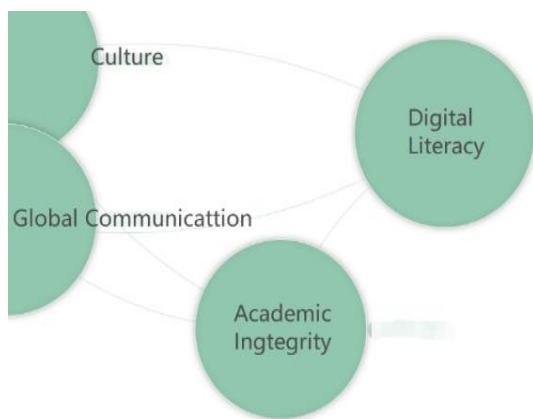


Fig. 2. Keyword co-occurrence in the published papers (2004–2023).



Fig. 3. Interdisciplinary studies on information literacy and global communication and culture.

## II. MATERIALS AND METHODS

Two courses were involved in the study: “Introduction to Digital Humanities” at the postgraduate level and “Intercultural Communication” at the undergraduate level. In total, 28 students (10 postgraduate students and 18 undergraduate students) volunteered to participate in the study. Although the students had different cultural and academic backgrounds, e.g., contrastive analysis and cultural studies, applied linguistics, Chinese language education, etc., both courses aimed at enhancing students’ cross-cultural adaptability and global communication skills through a series of cooperative learning tasks with joint efforts of the students and the instructors from both courses. The teaching approach used in the courses was Product-Oriented Approach emphasizing the integration of learning and thinking, and the unity of knowledge and practice. The cooperative learning task under discussion took the form of academic seminars in the above-mentioned two courses.

The 12-month study started from September of 2021 and lasted for two academic semesters. 28 students participated in the study. They studied the weekly learning materials in their respective class and joined the academic seminars (for both classes) four times, in Week 7, Week 11, Week 13 and Week 15 (See Table I). Seminar discussion in Week 7, 11 and 13 focused on the sharing of some popular tools and technology used in the field of arts and humanities and social sciences, e.g., VOSviewer, NVivo, ELAN, KH Coder, MAXQDA, etc. The last seminar in Week 15 was a forum in which the students presented their project work to all the students and instructors in both classes.

TABLE I. TEACHING CONTENTS OF “INTRODUCTION TO DIGITAL HUMANITIES” AND “PROFESSIONAL COMMUNICATION SKILLS”

Week	Course Name and Teaching Contents	
	1. Introduction to Digital Humanities (DH)	2. Intercultural Communication (IC)
1	Overview of the course	Overview of the course
2	Overview of DH	Language, culture and communication
3	DH & language	Cultural encounters 1: Studying in China and abroad
4	DH & literature	Culture shock and cultural adaptation
5	Tools used in DH research projects	Cultural encounters 2: Academic culture
6	DH & translation	Cultural encounters 3: Traditional culture and pop culture
7	Language, culture & communication: Academic seminar 1	
8	DH: methods & tools	Cultural awareness: Verbal and non-verbal communication
9	DH & media	Cultural encounters 4: food and clothing
10	DH industry & tourism	Cultural encounters 5: accommodation and travelling
11	Language, culture & communication: Academic seminar 2	
12	DH, innovation & entrepreneurship	Academic integrity and work ethics
13	Language, culture & communication: Academic seminar 3	
14	Application & prospects of DH	Sharing and Understanding: ways of doing, thinking and being
15	Language, culture & communication: Academic Seminar 4 (Sharing, Understanding and Communicating)	
16	Review	Review

Data for this study included the weekly teaching and learning materials of the two courses, 28 project presentations in the academic seminars, 172 journal entries (85,491 words) of the participants, eight focused group interviews (73,249 words) and a survey with a pretest and a post-test based on a 40-item questionnaire.

The five-point Likert-scale questionnaire was adapted from the design of [1, 3, 9, 10]. The questionnaire consisted of eight sections with 20 items evaluating the participants’ information literacy and the other 20 testing their global communicative competence.

Each of the focused group interviews was about 30 minutes. All the presentations and interviews were video-recorded and later transcribed.

### III. RESULTS AND DISCUSSION

The analysis and the discussion of the results attempt to answer the two research questions listed previously.

#### A. How are Language, Culture and Information Incorporated into the Curriculum?

As was mentioned earlier, two courses were involved in the study. One was a postgraduate course and the other an undergraduate course. The postgraduate course “Introduction to Digital Humanities” was offered to Year-1 postgraduate students majoring in Applied Linguistics, Comparative Linguistics, and Cultural Studies. The other course “Intercultural Communication” was offered to Year-2 undergraduate students majoring in Chinese language education.

TABLE II. THEME AND TITLE OF THE PRESENTATIONS IN THE ACADEMIC SEMINAR (MID-JUNE 2022)

Theme of the Seminar	
No.	Language, Culture and Communication: Innovation, Development and Sustainability
Presentation Title	
1	Analysis of hotspots and trends in empirical researches on digital humanities
2	Bibliometric analysis of the Intangible Cultural Heritage Researches from the Perspective of Digital Humanities
3	A study on the perception of the tourism image based on network text analysis
4	Research on digital humanities in Chinese master's and doctoral dissertations from 2017 to 2021—Bibliometric analysis based on VOSviewer
5	Visual analysis of domestic buzzwords researches based on VOSviewer (2016–2021)
6	Sentiment analysis of English language teaching in Coursera
7	Development of the digital humanities researches in the United States
8	Past, present and future of digital humanities in the UK
9	Computational linguistics and digital humanities
10	Understanding arts and humanities through numbers: Principles and paths of computer-aided content analysis
11	The development and prospect of wearable devices
12	Development and innovation in the digital cultural environment
13	The application of AI technology in English language teaching
14	The impact of VR technology on the international communication of Chinese culture
15	The effects of the “Flipped Classroom” model in China's education reform
16	Technology in Beijing's cultural heritage
17	The exploration of digital education and its prospect
18	Ethical issues on the application of artificial intelligence in education
19	Discussion on the trends and significance of digital museums in Beijing
20	Challenges and applications of miniature robots in medical treatment
21	Application of AR technology in the preservation of ancient buildings
22	The influence of virtual idols in the culture industry
23	Deep learning-based medical image processing techniques
24	Prospects of blockchain application in education
25	Computer vision meets deep learning: Tracing the evolution and anticipating the future
26	The application of virtual reality technology in education
27	Research on semantic segmentation based on CNN and transformer
28	Personal security of university students in the era of big data

In both courses, a blended teaching mode was employed making full use of multimodal teaching resources, four online teaching platforms of Tencent Meeting, WeChat, the Open MOOC XuetangX, and the Open edX. Apart from the traditional classroom, a VR classroom and a smart classroom equipped with three interactive whiteboards were also provided in both courses. The joint academic seminars were designed based on the Product-oriented Approach.

All the participants delivered presentations in the academic seminar held in the middle of June 2022. Presented below is the theme and title of the project presentations (Table II). The theme of the seminar was “Language, Culture and Communication: Innovation, Development and Sustainability”. Each presentation consisted of a 15-minute oral report followed by a 5-minute interactive session with the audience.

As can be seen from the table below, 12 out of 28 presentations (No. 1, 2, 3, 4, 5, 6, 20, 21, 23, 25, 26, and 27) dealt with the tools and technology the students had learned and discussed in class in the previous academic seminars. This indicates that the students found the tools introduced in the course useful and applied them in their learning projects. The interview data also provided supporting evidence. 14 students in six focused interviews mentioned that they found the software VOSviewer, KH Coder, and ELAN interesting and useful when analyzing multimodal data. 12 students also demonstrated their professional knowledge and technology in their presentations making full use of their professional knowledge in Python, C++, and artificial intelligence technology.

#### B. What Are the Effects of the Innovative Teaching Design and Practice on the Development of Students' Information Literacy and Global Communicative Competence?

The researcher conducted the questionnaire survey twice, one at the beginning of the academic semester in early September 2021 and the other at the end of June 2022. Based on the survey data and the presentations, the researcher identified two findings. First, a comparison of the pre-test and the post-test results on the questionnaire shows that through participating in the cooperative learning project (i.e., academic seminars) the students had improved their information literacy and global communicative competence in four aspects (Table III).

TABLE III. ANALYSIS OF THE PARTICIPANTS' INFORMATION LITERACY (IL2) AND GLOBAL COMMUNICATIVE COMPETENCE (GCC)

Aspects	Mean (Pre-test)	Mean (Post-test)
Attitudes and Ethics (IL)	1.088	4.671
Intercultural Awareness (GCC)	2.003	4.703
Knowledge (GCC & IL)	2.088	3.671
Skills in IT (IL)	2.312	3.701

Table III presents four aspects of improvement. On top of the improvement list is “Attitudes and Ethics”. Through listening to lectures and participating in the

collaborative learning projects, the students gained a comprehensive understanding of the concepts of “academic integrity”, “work ethics”, and “social responsibilities”. For example, one presenter (No. 18 in Table II) discussed the student’s understanding of intelligence, stressed Asimov’s “Laws of Robotics” and proposed potential solutions.

Apart from ethical thinking, the students’ intercultural awareness had also been improved (4.703 in the post-test vs. 2.003 in the pre-test). Moreover, the students had broadened their horizons, as was shown in their understanding of the preservation of cultural heritage (e.g., No. 2, 12, 16, and 21 in Table II) and the discussion of digital museums, Chinese culture and cultural industry (e.g., No. 14, 19, and 22 in Table II).

Finally, all the participants had applied their professional IT knowledge and skills in presentations, e.g., big data, AI technologies, natural language processing and data visualization. All the students were familiar with the functions of the VR classroom and six even used the VR classroom when video-recording their project presentations.

The second finding resulted from the analysis of the presentations. Among all the presentations, 10 were delivered by the postgraduate students and 18 by the undergraduate students. The presentations were analyzed following the guidelines of Harmonious Discourse Analysis [11]. Results show that all the students made full use of technology and public speaking skills to improve their speech effect. Despite of the different focus on the cultural issues related to the presentation contents, a tendency was also identified integrating the Chinese view of harmony and the international view of unity in the presentations. Finally, the researcher found that positive ecocultural identities were constructed and negotiated in the presentations which encouraged respect for individuals’ work and a sustainable and collaborative society. The findings provide supporting evidence for [12–14].

#### IV. CONCLUSION

In this study, the researcher explored the feasibility of designing an innovation learning project embedded in two technology-supported courses at the graduate and the undergraduate level. Attempts were also made to investigate the effects of the integration of language, culture, information and curriculum on the development of students’ information literacy and their global communication competence.

Analysis of the data shows that the design was effective in improving the students’ information literacy and their communicative competence. Moreover, positive ecological identities were identified in the students’ presentations.

There are many factors influencing the development of students’ information literacy and global communicative

competence at the individual, institutional and societal level. It is suggested that future research investigate the dynamics of various factors and the discursive interaction among the university students both in the real and in the virtual communities.

#### CONFLICT OF INTEREST

The author declares no conflict of interest.

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