International Journal of Web-Based Learning and Teaching Technologies
Volume 19 • Issue 1

Strategies of Improving Information Literacy of College Foreign Language Teachers Under the Background of Artificial Intelligence

Han Yu, Anhui Polytechnic University, China
Xinguo Li, Anhui Polytechnic University, China*
Brett Bligh, Lancaster University, UK

ABSTRACT

In the era of information technology, foreign language teachers should not only master the professional knowledge of foreign languages, but also master the theoretical knowledge and application skills of modern education technology, that is, have certain information literacy. This article studies the strategies to improve the information literacy of foreign language teachers in colleges and universities under the background of artificial intelligence, constructs the evaluation index system of foreign language teachers' information literacy using the analytic hierarchy process (AHP), and establishes a fuzzy evaluation model of foreign language teachers' information literacy based on the index system. The results show that foreign language teachers' information literacy level is above the middle level. The information literacy of teachers with different professional titles and ages is not consistent in the four dimensions of information awareness, information knowledge, information ability and information ethics.

KEYWORDS

Artificial intelligence, Foreign language teacher, Information literacy

INTRODUCTION

In the field of artificial intelligence, information technology plays a crucial role in the development of foreign language teachers. It not only offers essential learning content, but also enables foreign language educators to upgrade their skills and knowledge. In 2018, the Chinese Ministry of Education launched an initiative to introduce artificial intelligence into teaching, which aims to promote the professional development of teachers and encourage them to adapt to new technological changes. Artificial intelligence has revolutionized traditional foreign language education and teaching methods, bringing both opportunities and challenges. To effectively apply AI to foreign language education, it is necessary to cultivate the information-based teaching ability of foreign language teachers and

DOI: 10.4018/IJWLTT.336853 *Corresponding Author

improve their information literacy. This will be the key factor in integrating information technology and foreign language education and teaching. Therefore, it is crucial to provide comprehensive training and support for foreign language teachers in terms of information technology and AI. Only by doing so can we ensure that AI technology plays a positive role in foreign language education and teaching, ultimately benefiting both the teachers and students.

Information literacy includes three aspects: information awareness, information knowledge, and information ability. Therefore, whether foreign language teachers have information literacy can be examined from three aspects: whether they have an inherent demand for information and actively think of using information; whether they know advanced information theories and information technologies, such as basic computer knowledge, network technology, and multimedia knowledge; and whether they are good at using information technology to acquire, process, innovate, and generate new information (Godbey, 2018). As the key factor of higher education, teachers are the guides of talent cultivation in innovative society and the practitioners of scientific research innovation (Saikkonen & Kaarakainen, 2021).

Artificial intelligence is a comprehensive discipline that studies how to use computers to simulate and extend human brain functions. At present, text, image and speech recognition, machine translation, speech synthesis, natural language understanding, and other artificial intelligence technologies have been applied to foreign language education and teaching. Since the 21st century, the new generation of AI technology has been updated rapidly. In the field of education, great changes have taken place in teaching behavior and learning activities. In this case, teachers must improve their information literacy in order to meet the challenges brought by AI technology, and college foreign language teachers are no exception. Only by comprehensively improving their information literacy can they actively meet the opportunities and challenges brought by AI (Top et al., 2021; List, 2019). As a profession held to a high standard, teachers urgently need to have higher information literacy skills integrated in their professional development (Hanell, 2017; Majid et al., 2020). On the one hand, teachers should be able to master and apply new teaching technologies; on the other hand, they should use information technology to improve their scientific research ability (Schoenbach & Greenleaf, 2017; Gunes & Bahcivan, 2018).

The concept of information literacy first appeared in 1974. As a diversified concept, information literacy is based on information technology. It refers to the ability to skillfully use information technology tools through information technology training to obtain required information and solve relevant problems (Claro et al., 2018). The research on teachers' information literacy in education circles is based on the professional characteristics of teachers. Teachers' information literacy points to education and teaching practice. It is of great significance to study foreign language teachers' information literacy in the context of artificial intelligence.

This paper studies the strategies to improve the information literacy of foreign language teachers in colleges and universities under the background of artificial intelligence, constructs an evaluation index system of foreign language teachers' information literacy by using analytic hierarchy process (AHP), and establishes a fuzzy evaluation model of foreign language teachers' information literacy according to the index system. The evaluation index system and evaluation methods of foreign language teachers' information literacy determined in this study have a strong reference significance for the determination of evaluation index and evaluation methods of foreign language teachers' information literacy in college education.

RELATED WORKS

Information literacy is the ability to find, evaluate, organize, use, and communicate information, which is necessary to achieve the goals of society, occupation, and education (Batool & Webber, 2019). This also shows that information literacy is very necessary and is one of the important foundations for people to contribute knowledge to society. At the same time, having information literacy can

also promote an individual to become an effective lifelong learner, which means that information literacy is one of the necessary foundations of modern information society (Repanovici et al., 2021). Teachers' information literacy is unique in their profession, facing the practice of education and teaching (Dahlqvist, 2020). Different teachers need different qualities and abilities, which can play a good guiding role in improving teachers' information literacy through examples (Orlando, 2020; Gweon & Asaba, 2018). Up to now, there has been no uniform term or accepted definition for this concept. Developed countries in Europe and the United States often replace information literacy with digital literacy. The United Nations Educational, Scientific, and Cultural Organization (UNESCO) uses "Digital Competence" to cover all the above-mentioned qualities.

McGrew (2020) believes that information literacy is a comprehensive ability to identify information needs, discover, evaluate, search, manage, integrate, and use information ethically. Dai et al., (2019) emphasized seven levels of standards, including efficient access to information, rapid positioning of information requirements, effective use of information to complete specific projects, objective evaluation of information, and understanding and compliance with information laws and ethical norms. The results show that information literacy is involved in teachers' teaching academic activities and promotes teachers' independent and effective use of information technology in teaching activities. Zhao et al., (2017) emphasize the cultivation of students' information awareness and information skills, among which information skills mainly include information search and acquisition, information analysis and judgment, information processing, information innovation, information utilization, and information communication.

Information literacy includes the ability to build relationships with others, improve their quality, cooperate with others, ask questions, solve problems, design and provide information, share and utilize information, master information technology and distinguish information. Hui's information literacy ability model (2021) is not an index system in name, but it is actually an index system of university information literacy ability, consisting of 7 first-level indicators and 17 second-level indicators. Sena et al., (2020) conducted research on information literacy evaluation of foreign language teachers based on fuzzy comprehensive method. Scholars have made useful explorations in the research on the current situation of college foreign language teachers' information literacy. However, information technology has been developing rapidly, and many research results can no longer reflect the current level of English foreign language teachers' information literacy. Moreover, some of the studies have strong regional pertinence, some are too simple and general, and there is a lack of research on college English teachers in application-oriented universities in the existing research results.

RESEARCH METHOD

Construction of Foreign Language Teachers' Information Literacy Evaluation Index System

This study defines the concept of foreign language teachers' information literacy as: under the guidance of modern educational theory, foreign language teachers acquire, process, integrate, transmit, manage, evaluate, and exchange teaching information, realize the effective integration of information technology and curriculum, improve students' learning, and cultivate their awareness and ability of good information literacy (Yan & Feng, 2020). At the same time, the following principles should be followed in constructing the evaluation criteria of foreign language teachers' information literacy:

Scientific principle: Guided by the modern educational evaluation theory, especially the developmental teacher evaluation theory (Sun, 2021). Therefore, when constructing the standard system, we should follow the statistical data classification requirements, so that the upper and lower indicators are consistent, and the same level of indicators have different connotations and extensions, so as to ensure that the whole evaluation standard system constitutes a complete and scientific logical system.

Principle of consistency between indicators and purpose: The set indicators should be consistent with the evaluation purpose, that is, they should be able to achieve the expected purpose (Xiao & Hu, 2019). To what extent foreign language teachers' information literacy should be achieved, how teachers should guide teaching, and whether the information literacy education in schools is standardized all need to be evaluated and measured by practical information literacy standards (Huiying & Qiang, 2021). The connotation of information literacy is constantly developing and changing. At the same time, due to the different national conditions, history and culture of different countries, the economic development of different administrative regions in the same country is unbalanced. Therefore, the evaluation criteria of information literacy should be different instead of the same.

The principle of sustainability: On the basis of dynamics and development, some advanced and sustainable indicators should be designed (Chen, 2022). It is necessary to have both indicators that reflect the actual situation of the present and indicators that can reflect and forecast the needs of future development and be forward-looking.

Hierarchical principle: This is the concrete embodiment of developmental evaluation thought and respect for individual developmental differences. By using the index system of developmental evaluation, this paper evaluates and explains the process of foreign language teachers' information literacy development, and tries to help students correctly understand and grasp themselves and constantly develop and strive to a higher level.

Measurability principle: The first-level indicators are relatively abstract and then become more and more specific; while the last-level indicators are the most specific, so that the content of each evaluation indicator item is clear, intuitive, and reasonable. According to the characteristics and connotation of foreign language teachers' information literacy, this paper finds out the main evaluation factors, gives them clear and accurate expressions, and transforms them into specific and explicit evaluation criteria, thus constituting measurable evaluation criteria of foreign language teachers' information literacy.

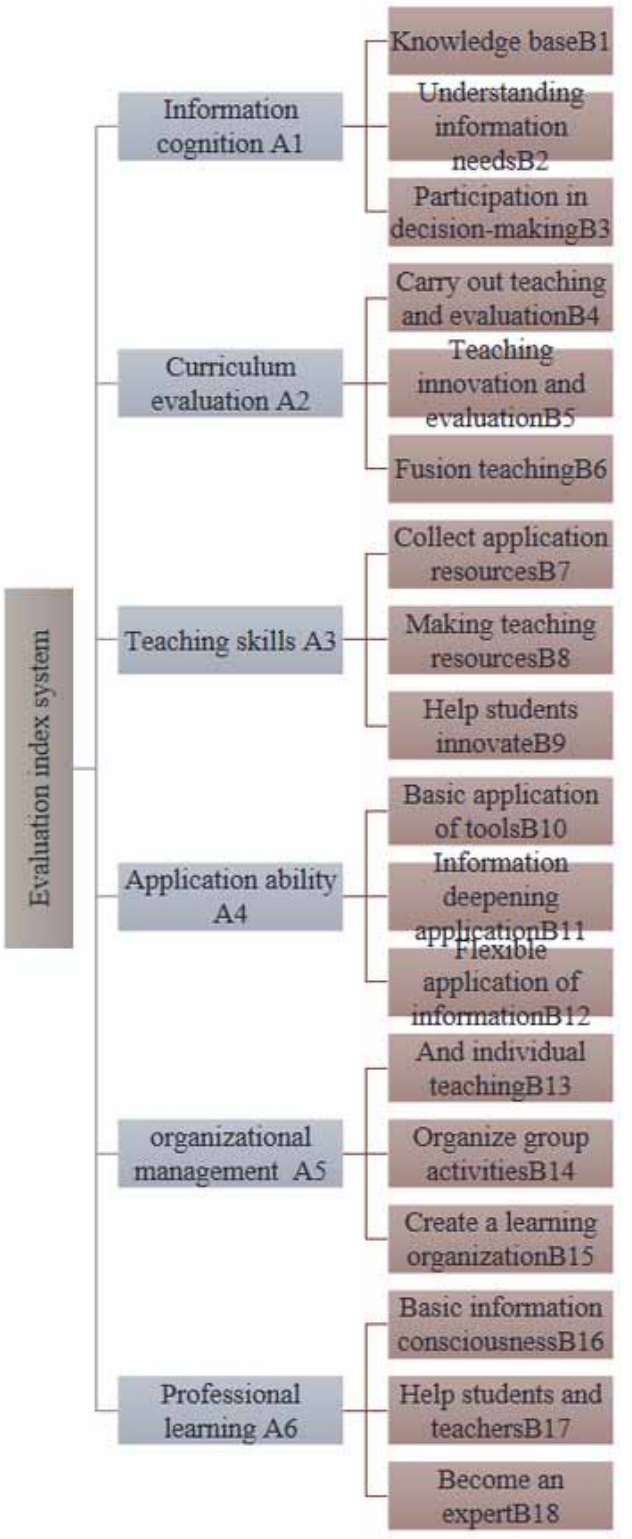
According to the research, the evaluation index system of foreign language teachers' information literacy is set up with 6 dimensions and 18 indicators. According to the current educational situation, each indicator is given different weight values to the actual embodiment of the functions and functions of each indicator in education and teaching by inviting 6 experts, including education research departments, education management departments, and senior teachers from different schools. The specific structure is as follows (see Figure 1).

The expert opinion evaluation method refers to letting a number of experts who have been engaged in educational work for a long time, know educational science, master educational laws, have rich practical experience, and have mastered the design principles of the index system, respectively, assign weights to each index in the index system, and then work out the weights of each index. It is the simplest method to determine the index weight. AHP is a method that decomposes the research problems into different factors according to the overall goal. It is a combination of quantitative and qualitative methods. This method can solve the problems of weight distribution and ranking. Factor analysis method is an objective index weight assignment method, and the normalized weight grading method in index quantitative evaluation method is a common standardized scoring method.

In the judgment of different decision makers, the proportion of each criterion is different among different levels, and the hierarchical structure reflects the relationship between factors, but its proportion is different. When determining the proportion of factors that affect a certain factor, the main difficulty encountered is that these proportions are usually not easy to quantify. In order to obtain reliable data, we usually use the method of establishing matrix, that is, pairwise comparison.

Assuming that the ratio of x_i, x_j restriction on a factor Z is a_{ij}, the ratio of x_i, x_j influence on Z can be:

Figure 1. Evaluation index system of foreign language teachers' information literacy



$$a_{ji} = \frac{1}{a_{ij}} \tag{1}$$

Through the expert consultation questionnaire survey, eight experts in related fields of research travel were contacted and invited based on their own actual experience. The judgment matrix A corresponds to the feature vector W of the maximum feature value $\lambda_{\max}$. The elements of the A matrix also need to meet the following formula:

$$a_{ij}a_{jk} = a_{ik}, \forall i, j, k = 1, 2, \cdots, n \tag{2}$$

A positive reciprocal matrix satisfying the above relation can be called a uniform matrix.

If the A consistent matrix holds, then the following results can be obtained: A must be a positive reciprocal matrix; The transpose matrix A^T of A is also a uniform matrix; The pairwise matrices of A must be in proportion with a factor greater than 0. If the eigenvector corresponding to the maximum eigenvalue $\lambda_{\max}$ of A is:

$$W = \left(w_1, , w_2, \cdots, w_n\right)^T \tag{3}$$

Then:

$$a_{ij} = \frac{w_i}{w_j}, \forall i, j = 1, 2, \cdots, n \tag{4}$$

Namely:

$$A = \begin{bmatrix} w_1 / w_1 & w_1 / w_2 & \cdots & w_1 / w_n \\ w_2 / w_1 & w_2 / w_2 & \cdots & w_2 / w_n \\ \vdots & \vdots & \ddots & \vdots \\ w_n / w_1 & w_n / w_2 & \cdots & w_n / w_n \end{bmatrix} \tag{5}$$

According to the fact that the n-order positive reciprocal matrix A is a consistent matrix, if and only if its maximum characteristic root $\lambda_{\max} = n$, and when the positive reciprocal matrix A is not consistent, there must be $\lambda_{\max} > n$.

Construction of Information Literacy Evaluation Model

The evaluation model of information literacy can be defined as the sum of the key elements of information literacy evaluation and their interrelationships. It is a quantitative research tool for objectively and scientifically evaluating teachers' information literacy levels. Drawing on the existing research results of the evaluation model in the field of education, the general process of building the evaluation model is: defining the connotation - building preliminary indicators - revising and improving the evaluation indicators - empowering the evaluation indicators - establishing the evaluation model - developing evaluation tools and conducting empirical application tests. Construct a new teaching

situation, build an intelligent learning platform for students, comprehensively apply various teaching methods, and cultivate applied, compound and expert-oriented high-quality talents with good academic literacy, good communication and cooperation, good problem solving and innovation, so as to promote the new development and promotion of university education. Incorporating AI translation can create personalized AI translation. Teachers are the key factors of education and teaching practice, and college foreign language teachers are the core implementers of college foreign language education and teaching.

The pace of informatization in various fields of the economy and society has been accelerated, and the level of informatization in the whole of society has been deepening. Colleges and universities aim to cultivate high-quality technical and skilled talents serving regional development, which requires university teachers to improve their information literacy, improve the application level of information technology, and have the ability to digitize and informationize the education and teaching resources they have accumulated and created and use the network to disseminate them.

After the establishment of the information literacy evaluation system, generally speaking, regardless of the research form or the research goal, researchers expect the research to be effective and valid. For many problems in life, these cannot be judged by simple fixed scores. However, the information literacy evaluation system of foreign language teachers with many indicators can't be evaluated with very accurate scores, because the indicators in the system are fuzzy to some extent.

Information as knowledge is obviously one of the contents of foreign language teachers' professional development, and excellent information literacy can guide foreign language teachers to reflect and understand themselves and improve teaching. Because the factors that affect foreign language teachers' information literacy are complex, latent, and fuzzy, fuzzy comprehensive evaluation method is used to establish an evaluation model. Fuzzy comprehensive evaluation method not only evaluates teachers' current information literacy, but also plays a role in improving teachers' information literacy in the future.

The model of local foreign language teachers' acceptance and adoption of information technology includes eight variables: performance expectation, effort expectation, attitude towards the use of information technology, community influence, convenience, self-efficacy, anxiety and behavior willingness. In this study, "the highest degree" was added to measure, while "voluntariness" was deleted. In order to be more in line with the characteristics of the research object, this study combined "age" and "experience" into "teaching experience" and added the variable "professional title." The research model to be tested in this study is shown in Figure 2.

The research model contains three dimensions of variables, namely: Independent variables: performance expectation, effort expectation, attitude towards the use of information technology, community influence, convenience, self-efficacy and anxiety; Dependent variable: willingness to act; and Control variables (also called adjustment variables): gender, highest education, professional title and teaching experience. This study focuses on combing statistical methods to explore whether the assumed seven independent variables have an effect on dependent variables' behavioral intentions, and whether these control variables can interfere with their effects.

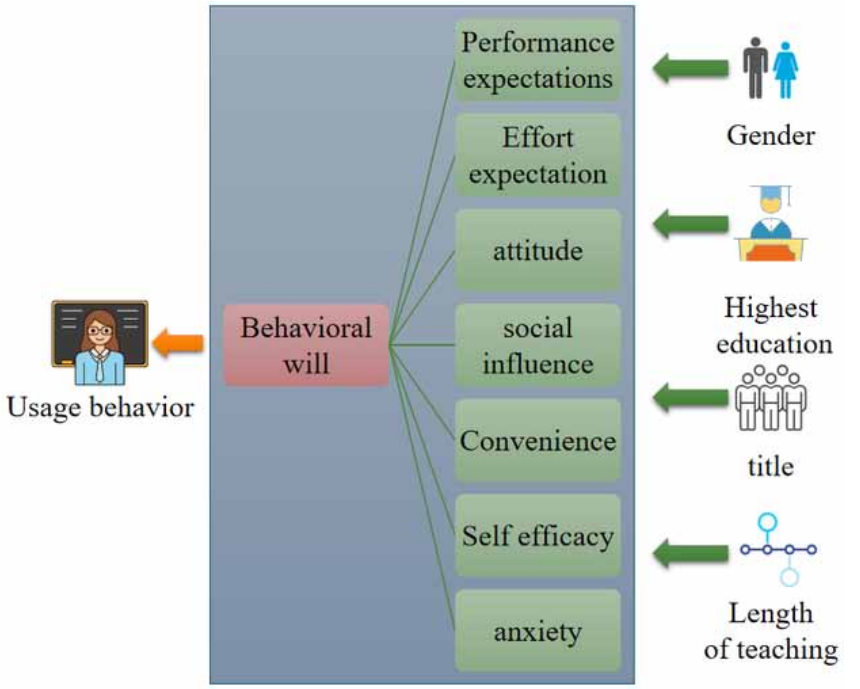
Evaluation object set:

$$Y\left\{y_1, y_2, \cdots, y_k\right\} \tag{6}$$

Each element in the set represents a different teacher, that is, all the evaluated teachers make up the set.

Through the fuzzy set U, U_i, V established above, this paper uses R to express the fuzzy relationship between evaluation index and evaluation grade, which is expressed as fuzzy matrix as follows:

Figure 2. Initial model of local foreign language teachers' acceptance of information technology



$$R = \begin{Bmatrix} U_1 \\ U_2 \\ \vdots \\ U_m \end{Bmatrix} \begin{bmatrix} r_{11} & r_{12} & \cdots & r_{1n} \\ r_{21} & r_{22} & \cdots & r_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ r_{m1} & r_{m2} & \cdots & r_{mn} \end{bmatrix} = \left(r_{ij}\right)_{m\times n} \tag{7}$$

r_{ij} in the matrix represents the degree of membership of U_i to the j-th grade, which depends on the degree of membership of each secondary index contained in the primary evaluation index U_i to each grade and the weight of each secondary index to this primary index.

What we need is the final comprehensive evaluation of the evaluated object. This requires us to make a step-by-step evaluation from the second level indicators. According to the fuzzy matrix multiplication, the evaluation formula is:

$$B = A * R \tag{8}$$

Where, B is the comprehensive evaluation vector; A is the index weight vector; R is the evaluation matrix corresponding to the weight vector.

Each group of data in matrix R is calculated by the grades of students' own evaluation, other students' evaluation, teachers' evaluation, and parents' evaluation. According to the weighted average $M\left(\cdot,+\right)$, the total evaluation matrix is calculated. A is the weight vector of the evaluation factor set.

Then, the values in B_i are normalized by formula (9) to obtain the first-level fuzzy evaluation matrix R, and then $B = \left(b_1, \cdots, b_4\right)$ is obtained. The normalized B is the final result of foreign language teachers' information literacy evaluation.

$$B_{ij} = A_{ij} * R_{ij} \tag{9}$$

If the evaluation is made according to the decision-making method of membership degree, the evaluation can be made according to the obtained evaluation result set B. However, because people are used to using a specific score to express the evaluation result, each item of V is assigned.

$$V = \left\{v_1, v_2, v_3, v_3\right\} = \left\{Excellent, good, fair, poor\right\} = \left\{H_1, H_2, H_3, H_3\right\} \tag{10}$$

The resulting score $Q = V^T * B$, where V^T is the inverted matrix of V.

ANALYSIS AND DISCUSSION OF RESULTS

After the establishment of foreign language teachers' information literacy evaluation system, in order to further verify the scientificity and rationality of the evaluation indicators, this study made a questionnaire according to the evaluation indicators, selected foreign language teachers as the research object, and conducted an investigation and research on the information literacy of foreign language teachers with different personal situations, such as gender, age, teaching years, professional titles, educational background, etc., and also discussed the influence of different factors on the information literacy performance level of foreign language teachers. This study selects foreign language teachers in a university as the research object.

In view of the large number of two-level indicators, the ranking method is used here to determine the weight of two-level indicators. The ranking method is to assume that there are n indicators in a certain set of indicators in the evaluation index system, and judge and rank these indicators according to their importance: "1" is used in the following table to indicate that this indicator is the most important; "2" means the second most important, and so on. Finally, the ranking results of m experts are summarized and added to the following table (as shown in Table 1 and Figure 3).

The expert ranking method is characterized by simple operation, convenient calculation, easy mastery, and high credibility. When the criteria of experts' judgment are scientific and reasonable, and the evaluation results are basically consistent, the determined weight is reliable and effective.

This study sought to determine whether foreign language teachers' information literacy is different in different teaching years and academic qualifications, and whether the differences are significant. This study found that foreign language teachers' information literacy performance level is different in academic qualifications and whether they are class teachers, but there is no difference in teaching years. Figure 4 shows the information literacy level of foreign language teachers with different teaching years.

It can be seen that the average performance of information literacy of foreign language teachers with different teaching years is between 2.6 and 3.87. The best performance is the information ethics of foreign language teachers with 15-20 years of teaching, and the worst performance is the information ability of foreign language teachers with 15-20 years of teaching.

Among foreign language teachers with more than 20 years of teaching experience, the worst performance is the information knowledge dimension, with an average of 3.21. This shows that foreign language teachers with long teaching experience have insufficient information knowledge, including "information theory knowledge" and "information skills knowledge."

Table 1. Weight distribution of teachers' information literacy evaluation indicators

Primary index	Weight	Secondary index	Weight
A1	0.222	B1	0.3151
		B2	0.6092
		B3	0.651
A2	0.3078	B4	0.3399
		B5	0.1741
		B6	0.5959
A3	0.2646	B7	0.4162
		B8	0.5075
		B9	0.17
A4	0.3705	B10	0.4423
		B11	0.5034
		B12	0.5408
A5	0.4504	B13	0.2123
		B14	0.4804
		B15	0.4425
A6	0.4416	B16	0.6585
		B17	0.2351
		B18	0.4892

Figure 3. Statistical chart of secondary index weight

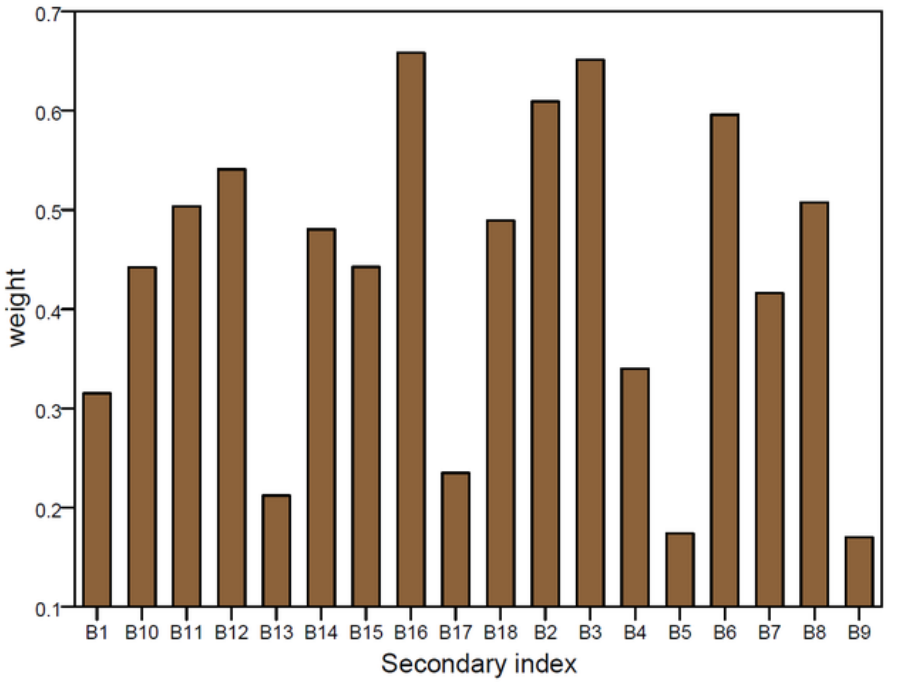
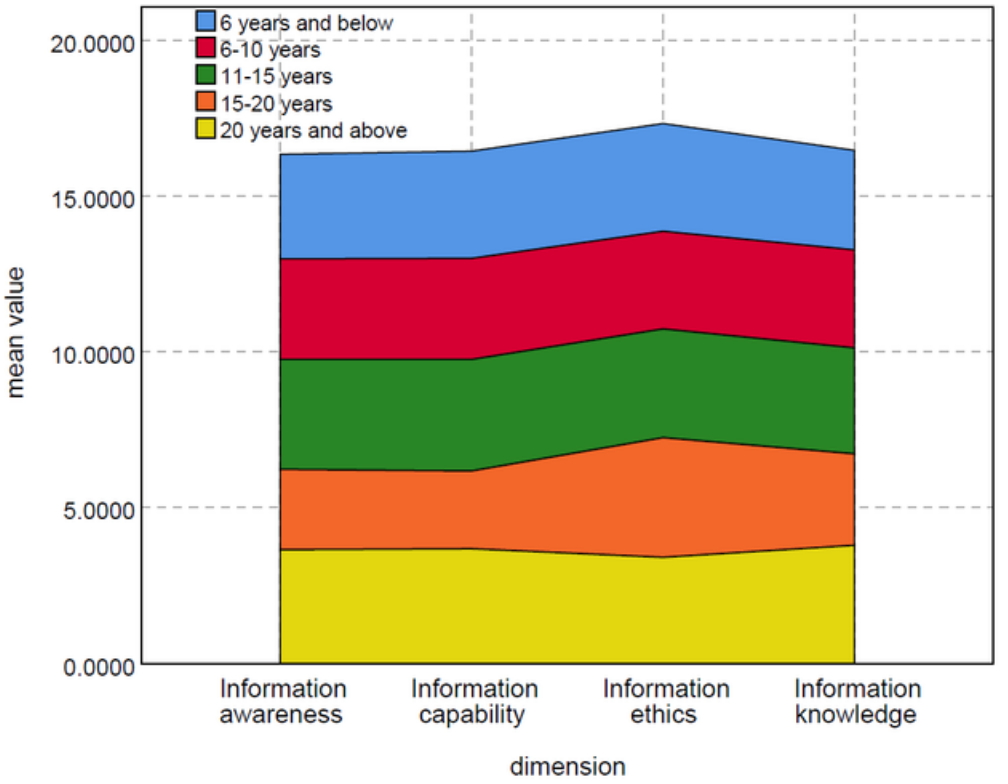


Figure 4. Information literacy performance level of foreign language teachers with different teaching years



As can be seen from Figure 5, the average performance of information literacy of foreign language teachers with different academic qualifications is between 3.1985 and 3.7492. The best performance is the information ethics dimension of foreign language teachers with graduate degrees, and the worst performance is the information awareness dimension of foreign language teachers with undergraduate degrees. The overall average of four dimensions of information literacy is 12.27. This shows that the level of information literacy performance of middle school foreign language teachers is positively correlated with academic qualifications, and the higher the academic qualifications, the better the information literacy performance. In addition, foreign language teachers with graduate degrees, undergraduate degrees, or junior college degrees or below have a low level of information awareness.

Through the single factor difference test of foreign language teachers' professional titles, we can judge whether professional titles will have significant differences on teachers' information literacy levels. There are significant differences in information literacy among different job titles in five aspects: knowledge level ($F=11.907$, $P=0.000<0.05$), skill level ($F=16.5$, 170, $P=0.000<0.05$), ability level ($F=13.170$, $P=0.000<0.05$), ethics level ($F=4.023$, $P=0.006<0.05$), and information literacy level ($F=13.171$, $P=0.000<0.05$).

Different professional titles have a significant impact on all dimensions of foreign language teachers' information literacy ability, and the comparison results are shown in Figure 6.

On the ethical level, there are significant differences between teaching assistants, lecturers, and associate professors, but there is no significant difference between professors and teaching assistants and lecturers and associate professors. This situation may be caused by the different pressure of teachers with different professional titles in scientific research tasks, the different mastery of professional

Figure 5. Information literacy performance level of foreign language teachers with different academic qualifications

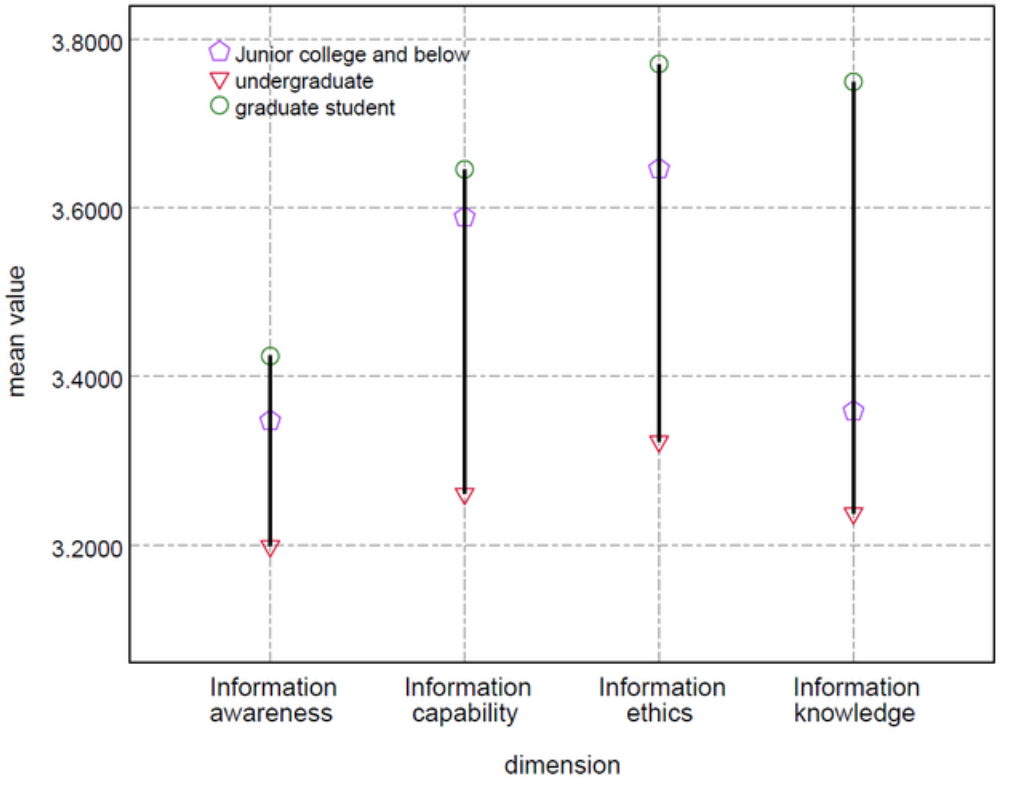
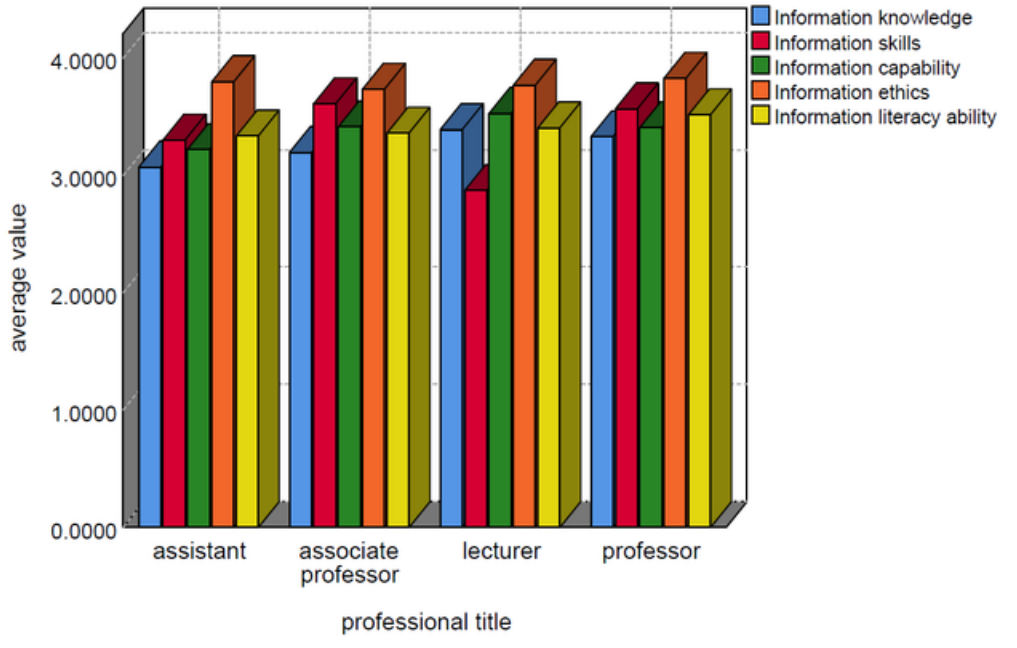


Figure 6. Comparative results of professional titles differences in information literacy level



knowledge, the difference of information technology application ability, and the different pursuit of professional title evaluation.

The study tested the familiarity of foreign language teachers' information literacy concepts by single factor difference, to determine whether this measurement will have a significant difference in teachers' information literacy level. Familiarity with the concept of information literacy will have a significant impact on all dimensions of foreign language teachers' information literacy ability, and the comparison results are shown in Figure 7.

Among them, the average information literacy scores of four dimensions are: very familiar > familiar > generally familiar > unfamiliar. The reason for this may be: the higher the teachers' knowledge of concepts related to information literacy, the better they know what knowledge, skills, abilities and ethics new teachers should learn under the background of AI, and they will consciously improve their information literacy from different dimensions. Therefore, teachers' information literacy concept cognition is positively related to their information literacy level.

It can be seen from Table 2 that in terms of information awareness, information knowledge, information ability, and "information ethics and safety," the F values of the overall test are 5.4343 (P=0 001<0. 05), 5.9308 (P=0. 001 <0. 05), 6.2768(P=0. 001 <0. 05), 6.4285 (P=0.01<0.05), both reached a significant level, indicating that subjects of different ages had significant differences in these four dimensions.

There are significant differences in all dimensions of information literacy among subjects of different ages. The subjects aged "25-30" are significantly higher than those aged "30-35" and "over 40" in the dimensions of information awareness, information knowledge, and information ability.

Figure 7. Comparative results of differences in familiarity of information literacy concepts

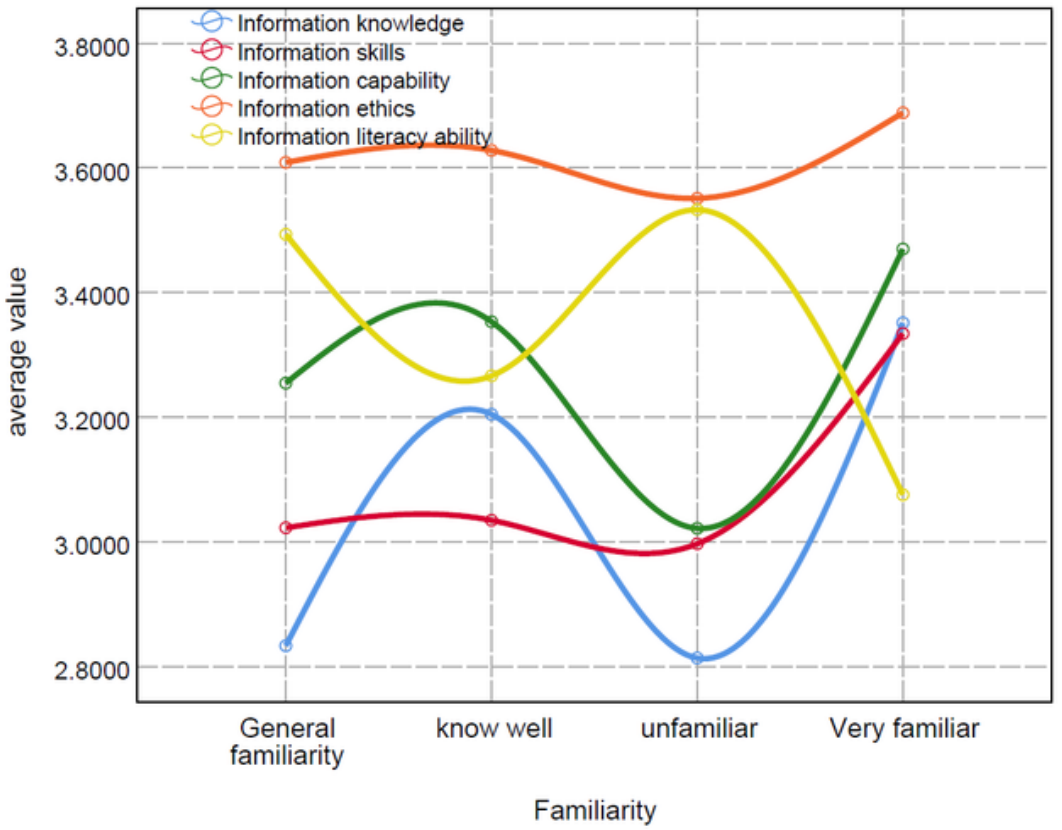


Table 2. Analysis on the differences of information literacy dimensions in age

Dimension	Age	M	SD	F	P
Information consciousness	25-30 years old	93.6968	3.9662	5.4343	0.001
	30-35 years old	34.13	4.0511		
	30-40 years old	63.9323	9.662		
	Over 40 years old	42.6918	9.6441		
Information knowledge	25-30 years old	34.8129	7.3533	5.9308	0.001
	30-35 years old	90.8323	7.524		
	30-40 years old	80.5108	7.553		
	Over 40 years old	71.697	6.4673		
Information ability	25-30 years old	78.7921	6.3672	6.2768	0.001
	30-35 years old	63.8414	9.3361		
	30-40 years old	53.5086	5.43		
	Over 40 years old	84.6423	5.7845		
Information ethics and security	25-30 years old	42.8268	5.7453	6.4285	0.001
	30-35 years old	57.4511	7.9946		
	30-40 years old	33.6354	3.3423		
	Over 40 years old	57.2697	7.1152		

This may be because people in this age group are younger, have easier contact with new things, have been working for a short time, and are full of enthusiasm for work.

The subjects aged "25-30" are significantly higher than those aged "35-40" in the dimension of information knowledge. The reason for the difference is that they have been exposed to information knowledge in terms of curriculum design when receiving education. They have also increased their information knowledge.

According to the survey results, it can be found that foreign language teachers' information literacy level is above the average level, but their information literacy performance is inconsistent in all dimensions. Among them, the information ethics dimension is the best, and the information consciousness dimension is the worst. The teaching age of the respondents will have a significant impact on their information literacy level. There is a negative correlation between teachers' teaching experience and teachers' information literacy. The professional title of the respondent will have a significant impact on its information literacy level. The average information literacy of four teachers' titles is teaching assistant > lecturer > professor > associate professor.

Under the background of deeper application of AI technology, what kind of intelligent education literacy teachers should have and how to use AI technology to carry out education and teaching reform are the contents that should be clearly put forward in this system. Only by truly realizing the importance of information technology, especially AI technology, to the reform of vocational education, can we overcome many difficulties in our daily work, constantly improve our basic skills, finally combine AI technology with our foreign language majors, and finally continuously improve the quality of foreign language teaching, thus providing a guarantee for the society to cultivate more excellent foreign language majors.

In order to adapt to the development of the times and carry out information teaching, foreign language teachers in vocational education must master the operation of related multimedia teaching equipment and a series of teaching aids. The development of foreign language teachers' information literacy in vocational education also requires the establishment of information innovation teams to

create an atmosphere of information-based teaching reform. When necessary, relevant leaders can promote team building, break departmental barriers and age restrictions, and create a new foreign language classroom for vocational education that keeps pace with the times. Using AI technology to deeply integrate foreign language teaching objectives and teaching contents into all aspects of training can continuously improve teachers' practical ability. For example, in the teaching process, teachers use AI technology to set appropriate learning methods, goals, and plans according to students' learning conditions, teach students in accordance with their aptitude according to their test results, constantly enhance their practical ability, and lead and drive more traditional foreign language teachers to transform into new foreign language teachers.

Due to the limited time for AI technology to enter education, and although it has great application potential, to define an accurate model of teachers' information literacy in the intelligent era, we still need to take time to conduct in-depth research and practice. When applying AI technology to education, we should not only pay attention to the technology itself, but also pay more attention to the potential ability and problems of education brought by technology. The improvement of teachers' information literacy is an important part of education informatization. The impact of technology on education comes from learning, teaching, leadership, evaluation, infrastructure, and other aspects. We should overcome the problem of paying too much attention to technology in the teacher training and pay more attention to the two important influencing factors of teachers themselves and the resource construction promoted by the school as a whole.

CONCLUSION

In this paper, the promotion strategy of college foreign language teachers' information literacy under the background of AI is studied, the evaluation index system and evaluation model of foreign language teachers' information literacy are established, and fuzzy comprehensive evaluation method is used to evaluate foreign language teachers' information literacy. The results show that foreign language teachers' information literacy level is above the average level, but it is inconsistent in all dimensions of information literacy. There are significant differences in information literacy among different job titles in five aspects: knowledge level ($F=11.907$, $P=0.000<0.05$), skill level ($F=16.5$, 170, $P=0.000<0.05$), ability level ($F=13.170$, $P=0.000<0.05$), ethics level ($F=4.023$, $P=0.006<0.05$), and information literacy level ($F=13.171$, $P=0.000<0.05$). Different professional titles have a significant impact on all dimensions of foreign language teachers' information literacy ability. There are significant differences in all dimensions of information literacy among subjects of different ages.

Currently, there is only an official evaluation standard for the information literacy ability of primary and secondary school teachers in China, and there is no authoritative institution that has launched an evaluation standard for college teachers. Therefore, it is necessary to establish a scientific and unified standard for the development and evaluation of teachers' information literacy ability, which will promote the improvement of college teachers' information literacy abilities more effectively. The research on university teachers' information literacy ability is complex, and this research only analyzes it from the perspectives of information awareness, information knowledge, information ability, information ethics, and security. A more in-depth study of the influences and influencing factors will rely on future research.

DATA AVAILABILITY

The figures and tables used to support the findings of this study are included in the article.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

FUNDING STATEMENT

This work was supported by Anhui Provincial Scientific Research Project under grant no.2022AH050938.

ACKNOWLEDGEMENTS

The authors would like to show sincere thanks to those techniques who have contributed to this research.

REFERENCES

Batool, S. H., & Webber, S. (2019). Mapping the state of information literacy education in primary schools: The case of Pakistan. *Library & Information Science Research*, *41*(2), 123–131. doi:10.1016/j.lisr.2019.04.006

Chen, Y. (2022, July). Research on Comprehensive Management of Digital Literacy Education in the Era of Big Data. In *2022 6th International Conference on Education and Multimedia Technology* (pp. 421-427). ACM. doi:10.1145/3551708.3551766

Claro, M., Salinas, A., Cabello-Hutt, T., Martin, E. S., Preiss, D. D., & Valenzuela, S. (2018). Teaching in a digital environment (tide): Defining and measuring teachers' capacity to develop students' digital information and communication skills. *Computers & Education*, *2018*(6), 121. doi:10.1016/j.compedu.2018.03.001

Dahlqvist, C. (2020). Information-seeking behaviours of teacher students: A systematic review of quantitative methods literature. *Education for Information*, *2020*(4), 1–26.

Dai, F., Wei, K., Chen, Y., & Ju, M. (2019). Construction of an index system for qualitative evaluation of undergraduate nursing students innovative ability: A Delphi study. *Journal of Clinical Nursing*, *28*(23-24), 4379–4388. doi:10.1111/jocn.15020 PMID:31411352

Godbey, S. (2018). Testing future teachers: A quantitative exploration of factors impacting the information literacy of teacher education students. *College & Research Libraries*, *79*(5), 611–623. doi:10.5860/crl.79.5.611

Gunes, E., & Bahcivan, E. (2018). A mixed research-based model for pre-service science teachers' digital literacy: Responses to "which beliefs" and "how and why they interact" questions. *Computers & Education*, *118*(9), 96–106. doi:10.1016/j.compedu.2017.11.012

Gweon, H., & Asaba, M. (2018). Order matters: Children's evaluation of underinformative teachers depends on context. *Child Development*, *89*(3), 278–292. doi:10.1111/cdev.12825 PMID:28542838

Hanell, F. (2017). Teacher trainees' information sharing activities and identity positioning on Facebook. *The Journal of Documentation*, *73*(2), 244–262. doi:10.1108/JD-06-2016-0085

Hui, Y. (2021). Evaluation of blended oral English teaching based on the mixed model of spoc and deep learning. *Scientific Programming*, *2021*(10), 2021. doi:10.1155/2021/7044779

Huiying, X., & Qiang, M. (2021). College English cross-cultural teaching based on cloud computing MOOC platform and artificial intelligence. *Journal of Intelligent & Fuzzy Systems*, *40*(4), 7335–7345. doi:10.3233/JIFS-189558

Jian, Y. C., & Ko, H. W. (2017). Influences of text difficulty and reading ability on learning illustrated science texts for children: An eye movement study. *Computers & Education*, *113*(18), 263–279. doi:10.1016/j.compedu.2017.06.002

List, A. (2019). Defining digital literacy development: An examination of pre-service teachers' beliefs. *Computers & Education*, *138*(10), 146–158. doi:10.1016/j.compedu.2019.03.009

Majid, S., Foo, S., & Chang, Y. K. (2020). Appraising information literacy skills of students in Singapore. *Aslib Journal of Information Management*, *72*(3), 379–394. doi:10.1108/AJIM-01-2020-0006

Mcgrew, S. (2020). Learning to evaluate: An intervention in civic online reasoning. *Computers & Education, 145*(12), 103711.1-103711.13.

Orlando, S., Gaudioso, E., & Paz, F. (2020). Supporting teachers to monitor student's learning progress in an educational environment with robotics activities. *IEEE Access : Practical Innovations, Open Solutions*, *2020*(99), 1–1. doi:10.1109/ACCESS.2020.2978979

Repanovici, A., Rotaru, C. S., & Murzea, C. (2021). Development of sustainable thinking by information literacy. *Sustainability (Basel)*, *13*(3), 1287. doi:10.3390/su13031287

Saikkonen, L., & Kaarakainen, M. T. (2021). Multivariate analysis of teachers' digital information skills - the importance of available resources. *Computers & Education*, *168*(2), 104206. doi:10.1016/j.compedu.2021.104206

Schoenbach, R., & Greenleaf, C. (2017). Leading for literacy. *Phi Delta Kappan*, *99*(3), 59–64. doi:10.1177/0031721717739596

Sena, A., & Howard, M. (2020). Quantifying teaching behavior in robot learning from demonstration. *The International Journal of Robotics Research*, *39*(1), 54–72. doi:10.1177/0278364919884623

Sun, W. (2021, September). The Status Quo of Information Technology-based English Informatization Education in Colleges and Universities. In *2021 4th International Conference on Information Systems and Computer Aided Education* (pp. 1038-1042). ACM. doi:10.1145/3482632.3483078

Top, E., Baser, D., Akkus, R., Akayoglu, S., & Gurer, M. D. (2021). Secondary school teachers' preferences in the process of individual technology mentoring. *Computers & Education*, *2021*(7), 160. doi:10.1016/j.compedu.2020.104030

Xiao, Y., & Hu, J. (2019). Assessment of optimal pedagogical factors for Canadian ESL learners' reading literacy through artificial intelligence algorithms. *International Journal of English Linguistics*, *9*(4), 1–14. doi:10.5539/ijel.v9n4p1

Yan, M., & Feng, W. (2020). Practice of information technology in translation teaching at Chinese regional universities in the era of artificial intelligence. *European Journal of Education Studies*, *7*(10). doi:10.46827/ejes.v7i10.3285

Zhao, J., & Yu, L. (2017). The construction and analysis of aerobics teacher's teaching ability evaluation model. *Revista de la Facultad de Ingeniería*, *32*(14), 79–83.

Yu Han (1978-) received her MA in linguistics and foreign linguistics from University of Shanghai for Science and Technology in 2010. She is currently a lecturer in the School of Foreign Studies of Anhui Polytechnic University. Her research interests include linguistics, translation, and English education. Li Xinguo (1976-) received her MA in linguistics and foreign linguistics from Southeast University in 2008. He is currently a professor in the School of Foreign Studies of Anhui Polytechnic University. His research interests include applied linguistics, translation, information technology and English education.