Influence of Knowledge Sharing on Students' Learning Ability under the Background of "5G+AI"

https://doi.org/10.3991/ijet.v17i01.28533

Jie Zhao
Hebei University of Engineering, Handan, China
zhaojie@hebeu.edu.cn

Abstract—The integration of 5g and AI realizes the intelligent communication and deep interaction between educators and learners, and promotes the reconstruction of various education and teaching resources in space and time dimensions. With the wide application of 5g and AI technology, knowledge sharing has become ubiquitous. The willingness and behavior of knowledge sharing provide a huge space for students to improve their learning ability. Taking 5g + AI new technology as the intermediary variable, this study analyzes the impact of knowledge sharing on students' learning ability. The results show that the overall reliability coefficient is 0.787. The reliability of the questionnaire is high, and the Kaiser Meyer Olkin value is 0.756, ranging from 0.7 to 0.8. The validity of the research data is good. The willingness to share knowledge has a positive role in promoting the improvement of students' learning ability. Knowledge sharing behavior plays a positive role in promoting the improvement of students' learning ability. "5g + AI" new educational technology plays an intermediary role in actively promoting knowledge sharing behavior and improving learning ability. The research results have important reference value for fully understanding the impact of knowledge sharing on the improvement of students' learning ability under the background of 5g + AI.

Keywords—"5G+AI", knowledge sharing, student, learning ability

1 Introduction

At present, China is in the key development period of improving the quality of education, enhancing the value and empowering it, and information technology is in a period of rapid development in the field of education. The in-depth integration of various emerging technologies in the field of education has led to many changes in educational methods, making education more adaptable to the needs of efficient learning and mobile learning in the future society. Since 2009, the all-round rise of 5G communication technology has aroused great interest from all walks of life and made the education management departments of various countries realize the opportunities and challenges of new technology to education and teaching mode. Compared with the previous four generations of communication technologies, 5G technology has the advantages of high bandwidth, low delay, and universal connection. The 5G network is a simple upgrade

of the traditional network communication capability and an efficient integration with artificial intelligence (AI), Internet of Things, virtual and augmented reality, and other technologies, thereby forming a technical scene of "5G+AI" and realizing the reconstruction of the spatial position and the adjustment of the time dimension of educators and learners. Under such a technical field, the 5G network can realize the comprehensive perception of the educational object to the educational subject across time and space, the virtual reconstruction of the actual teaching equipment, and the remote high-precision real-time control. In particular, the comprehensive maturity and large-scale application of 5G and AI technologies make the layout of information infrastructure in the whole society efficiently configured, which will have a revolutionary and huge effect on the competent department of education and the education industry. The "5G+AI" technology can provide strong support for the landing of pervasive computing and the construction of ubiquitous learning space. With the help of small and micro sensing devices and wearable intelligent terminals, researchers can perceive the physical environment and learners' state in real time and in multiple directions, present information in the form of virtual and real integration, and promote learners' cognition. The intelligent computing mode of 5G high-speed network can support intelligent computing, interconnection, and deep integration of environmental information.

At present, China's online learning resources are overloaded, and many open education resources are found on the Internet, but few advanced, high-quality, and authoritative resources are available. Learning resources lack uniform standards, with high repetition rate, low utilization rate, excessive demand for resources, and insufficient supply. An imbalance is found in the development of high-quality education resources in terms of layout, scale, and level. Easy-to-obtain resources are often difficult to meet students' needs, and high-quality resources are difficult to obtain. This condition leads to the mismatch between resources and students' needs, seriously affecting education equity and is unfavorable to the development of online learning. Therefore, the in-depth application of 5G+AI technology in the field of education will lead to the reconstruction of the educational information ecosystem, which will completely change various educational elements, such as educational subject, educational object, educational resources, teaching management, and educational evaluation, and make the endogenous motivation of education to support the development of various industries stronger. In particular, the comprehensive maturity and large-scale application of 5G and AI technologies make the layout of information infrastructure in the whole society efficiently configured, which will have a revolutionary and huge effect on the competent department of education and the education industry. The "5G+AI" technology can provide strong support for the landing of pervasive computing and the construction of ubiquitous learning space. With the help of small and micro sensing devices and wearable intelligent terminals, researchers can perceive the physical environment and learners' state in real time and in multiple directions, present information in the form of virtual and real integration, and promote learners' cognition. The intelligent computing mode of 5G high-speed network can support intelligent computing, interconnection, and deep integration of environmental information.

2 Theoretical basis and conditional assumptions

2.1 Theoretical basis

In accordance with social cognitive theory, people are neither driven by internal forces nor controlled by external forces. The realization of human function is a ternary interaction and is determined by the joint action of behavior, cognition, other human factors, and environment. Although the three factors are mutually beneficial, the influence of their mutually beneficial relationship is asymmetrical. For example, when the environment gives strong restrictions on behavior, the environment plays a decisive role as a factor controlling everything. The three groups of factors do not affect each other at the same time. Individual's beliefs, goals, emotions, and other cognitive methods affect or determine the behavior, and the results of behavior affect the individual and the individual's cognition. Among the individual's cognitive factors, the decisive role is self-efficacy and expected results. As the condition for the realization of behavior, the environment determines the direction and intensity of behavior. The result of behavior can change the environment so that the environment can better adapt to the individual. Knowledge sharing in the online learning space can occur between individual learners and is completed by the continuous knowledge transformation process between two knowledge subjects. It can also occur between learners and learner groups through the network learning space. The provided explicit social network platform and tacit knowledge network platform realize the exchange and transformation of knowledge and achieve knowledge sharing. In the process of knowledge sharing, the accumulation and reconstruction of learners' individual knowledge are realized, and the knowledge system in the network learning space is enabled to be continuously supplemented and optimized, making it a dynamic state of continuous evolution into a new equilibrium state.

Constructivism shows that learning is a process in which learners actively construct knowledge, rather than a simple process of inputting information from outside to inside. Learners often start from their own unique knowledge background, interact with the original knowledge and experience through learning new knowledge, and construct an understanding of new knowledge on the basis of the original knowledge or experience because they different backgrounds. Constructivism emphasizes learners' active construction, which includes learners' construction of new information meaning and the transformation and reorganization of their original experience. Learners' acquisition of knowledge depends on their ability to construct relevant knowledge according to their original experience, psychological structure, and beliefs, but not on their ability to memorize and recite the contents taught by teachers, emphasizing students' initiative.

2.2 Hypothetical presentation

Knowledge sharing is assumed as a process of knowledge transfer to some extent, in which knowledge is transferred from the provider to the receiver. In this process, knowledge has experienced the refinement and expression of the provider and the internalization and sublimation of the receiver. From the point of view of knowledge

transfer, knowledge sharing can be defined. Ensign, P.C. thought that knowledge sharing refers to the process that knowledge, as a scarce resource, trades between providers and recipients [1]. Collins, C.J. indicated that knowledge sharing includes two dimensions: knowledge sharing willingness and knowledge sharing behavior [2]. In terms of knowledge sharing willingness, his classic questionnaire includes three questions, and in terms of knowledge sharing behavior, his classic questionnaire includes four questions. Salopek, J. J believed that knowledge sharing is a process of knowledge exchange among members, which is based on mutual trust and respect among members [3]. From the perspective of organizational learning, knowledge sharing is the transfer of knowledge between different individuals in the organization. Choi, B considered knowledge as a valuable strategic asset that can provide proprietary competitive advantage. Enterprises should make themselves different through knowledge management (KM) strategy [4]. Kankanhalli, A believed that KM system can be used to utilize its knowledge resources. The results show that knowledge self-efficacy and the pleasure of helping others significantly affect the use of electronic knowledge repository by knowledge contributors [5]. Law, C. C believed that knowledge sharing and learning behaviors in the workplace are considered to be extremely important to the success of enterprises [6]. Corporate executives should encourage internal knowledge management and organizational learning activities within the enterprise and give due consideration to the strategies and strategies that support these activities. Implementation must be planned to improve corporate performance. Eid, M. I empirically studied various types of social networks used by students in a university in Saudi Arabia [7]. The results show that a significant positive correlation is found between online chat, online discussion, and knowledge sharing. The research results of Barak, M show that online activities can promote learning and evaluation in higher education by promoting active learning, constructive criticism, and knowledge sharing [8]. Elmholdt, C thought that knowledge sharing effectively promotes learners' enthusiasm, leading to self-efficacy and improved learning performance [9]. King, W.R. (2008) considered that KMS plays an important role in promoting knowledge sharing [21]. Khalil, O.E. analyzed the barriers and effectiveness of knowledge sharing in higher education institutions and believed that teachers' knowledge is rarely shared with peers, which is unconducive to improving teaching performance [22]. Van Weert, T.J. regarded that the new information and communication technology is making the knowledge society rise, and knowledge sharing has become an inevitable requirement [23]. This study investigates the influence of knowledge sharing on education and education professionals through questionnaire. Bibi, S discussed the influence of sharing motivation, interpersonal trust, job engagement, job satisfaction, and continuous commitment on knowledge sharing behavior of university scholars [24]. The results show that job involvement and continuous commitment are important determinants of knowledge sharing behavior in academia. Elrehail, H studied the mechanism of leadership style under the intermediary influence of knowledge sharing [25]. The results show that knowledge sharing has a positive effect on the innovation of Jordanian higher education institutions. The research results of Ngulube, P show that knowledge sharing is the key to promote the continuous improvement of work performance of higher education institutions [26]. Bock, G.W.thought that reciprocity norms are positively correlated with knowledge

sharing among employees. The reciprocity between knowledge owners and knowledge demanders in enterprises is positively correlated with knowledge sharing efficiency. This study believes that knowledge sharing can further improve the learning ability of students. Therefore, the first and second hypotheses of this study are proposed [27].

H1: Knowledge sharing willingness is positively promoting the improvement of students' learning ability.

H2: Knowledge sharing behavior is positively promoting students' learning ability.

The "5G+AI" technology will first promote the innovation of various teaching elements, including activating high-definition, dynamic, and 3D learning resources, building a ubiquitous and intelligent learning space, catalyzing the production of portable and intelligent teaching tools, and improving the quality of teachers and students in terms of cognition and collaboration ability. OPINCARIU, M believed that 5G and AI will open up new possibilities for online learning platforms and will provide unprecedented access and depth to understand all variables in the spectrum. This unique combination will provide students with personalization the choice of courses is conducive to a higher participation rate [10]. Dake, D. K indicated that modern educational institutions can benefit from the deployment of 5G-supported services to adapt to this sector. 5G and its disruptive technologies are advancing the concept of intelligent education systems and will promote new teaching and learning in the education field [11]. Liu, C regarded that the rapid development of technology industry has driven the development of a new ecology of wisdom education and brought new opportunities and challenges to China's future education [12]. Li, Z thought that optimizing website layout can improve students' English ability and improve the quality of authors [13]. Yuen, S. C. y discussed the overview and five directions of AR in education. Salmi, H believed that AR technology makes invisible things visible and can bridge the gap between formal education and informal learning [14]. Hong, y considered that AI, big data, and 5G are science and technology that lead the online education industry to slow down and enter a richer ecosystem [15, 16]. Online education is a new network-based education model that increases the flexibility and availability of learning time, place or speed. Fang, Z believed that the wide application of 5G standard can effectively improve the education of building management, the practice of civil engineering, and the laboratory practice of undergraduates [17]. Chen, C regarded that the deep combination of information technology and education provides complete technical support and deep foundation for intelligent education [28], analyzes the technical composition of intelligent learning environment in 5G environment, and discusses the challenges faced by intelligent learning environment in 5G environment. Gao, Y indicated that the fifth-generation mobile communication technology is the latest generation of cellular mobile communication technology. He investigated and analyzed the application of modern education technology in English majors in the 5G era [18]. The research results show that 5G information technology can effectively improve students' enthusiasm and ability to learn English. This study believes that under the background of "5G+AI," the new educational information technology can promote students to further strengthen knowledge sharing, and such knowledge sharing can further enhance their learning ability. The new educational technology of "5G+AI" has mediating effect in promoting learning ability in

knowledge sharing. Therefore, the third and fourth hypotheses of this study are proposed [29].

H3: The new educational technology of "5G+AI" has a mediating effect in the positive promotion of learning ability by knowledge sharing willingness.

H4: The new educational technology of "5G+AI" has a mediating effect on the positive promotion of learning ability in knowledge sharing behavior.

The proposed research and analysis model is shown in Figure 1.

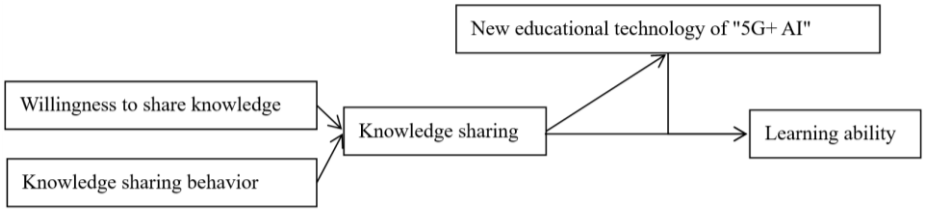

Fig. 1. Research and analysis model

3 Research design

3.1 Questionnaire design

Four potential variables, which are knowledge sharing willingness, knowledge sharing behavior, learning ability, and "5G+AI" new educational technology, are found in this research model. The items of the questionnaire mainly come from the existing research to improve its reliability and validity. Two groups of experts are invited to judge the questionnaire items and judge whether the questionnaire items can really investigate the potential variables. This process is performed to improve the construct validity of the questionnaire. The first group of experts is mainly composed of university professors who are good at questionnaire surveys and knowledge sharing research. The experts comprehensively evaluate the grammar and content of the questionnaire items [20]. The second group of experts is mainly composed of university teachers who often organize online learning space teaching activities. They evaluate the feasibility of the questionnaire, mark, and modify ambiguous items. The researcher summarizes the labeling of experts, deletes the items that are not approved by experts, and summarizes the items to form an initial questionnaire. The final questionnaire consists of two parts. The first part is used to investigate learners' personal information, such as gender, age, and other basic information. The second part is the core of the questionnaire, which mainly measures the potential variables, including 16 items. The classic questionnaire of Collins, C. J (2006) is used for knowledge sharing, including 3 items to measure knowledge sharing intention and 4 items to measure knowledge sharing behavior [23]. Three items are used to measure learning ability, and six items are used to measure "5G+AI" new technology. Each item was measured with a 7-point Likert scale, where 1 denotes "strongly disagree" and 7 indicates "strongly agree."

3.2 Data collection

This study first conducted a small sample pretest to ensure the validity and scientificity of the questionnaire, and the content of the questionnaire was modified through the distribution of 76 questionnaires and preliminary analysis to form the final questionnaire. The questionnaire mainly uses Likert's seven-level scale test. Considering the background of "5G+AI," universities and students need to have a good foundation of informatization and information literacy. On this basis, a typical survey method is adopted to select undergraduates in the "Double First Class" educational technology discipline from a 985 university in Shanghai to conduct a questionnaire survey and to ensure the response rate and accuracy of the questionnaire. A total of 212 questionnaires were issued, and 168 were returned. After excluding the questionnaires with logical contradictions, 153 valid questionnaires were obtained, with a recovery rate of 79.25% and an effective rate of 72.17%. The sample attribute statistics are shown in Table 1.

Table 1. Sample characteristics

Classification	Category	Quantity	Proportion
Gender	Man	86	56.21%
	Woman	67	43.79%
Grade	Freshman	32	20.92%
	Sophomore	41	26.80%
	Junior	57	37.25%
	Senior	23	15.03%
The preference of "5G+AI"	like it very much.	69	45.10%
	prefer...above all others	78	50.98%
	Dislike	6	3.92%

4 Research results

4.1 Reliability and validity test

After collecting the questionnaire, the questionnaire data were inputted into SPSS for statistical analysis. Statistical analysis mainly includes reliability and validity test of measurement model and confirmatory factor analysis of structural model. The reliability and validity of the research tools are tested to ensure their reliability and effectiveness. The analysis shows that Cronbach's alpha coefficient of variables in the questionnaire is greater than 0.668, and the overall reliability coefficient is 0.787. The reliability of the questionnaire is high, that is, the questions of the questionnaire are consistent and reliable.

As shown in Table 2, validity research is used to analyze whether the research items are reasonable and meaningful, and factor analysis is used for validity analysis. KMO values are used for comprehensive analysis, and KMO and Bartlett tests are used for validity verification. From the above table, the KMO values are 0.756, ranging from 0.7 to 0.8, and the validity of research data is good. The questionnaire in this study is

based on the collation and analysis of domestic and foreign knowledge sharing literature, and experts in the fields of education, science and technology are invited to test the questionnaire. The questionnaire officially tested in this study is based on the opinions of experts and scholars, statistical analysis of suitable and unsuitable items, and correction of inappropriate words and sentences, and compiled, therefore, the validity of this study is good.

Table 2. Reliability test table

Name	Total correlation of correction items (CITC)	The alpha factor of the item has been deleted	Cronbach α coefficient	Cronbach α coefficient
Knowledge sharing willingness	0.298	0.790	0.668	0.787
	0.632	0.352		
	0.537	0.493		
Knowledge sharing behavior	0.615	0.644	0.746	
	0.585	0.661		
	0.541	0.688		
	0.429	0.749		
"5G+AI" new technology	0.513	0.792	0.810	
	0.502	0.795		
	0.541	0.786		
	0.653	0.761		
	0.643	0.762		
	0.568	0.780		
Learning ability	0.481	0.567	0.666	
	0.506	0.532		
	0.448	0.609		

Table 3. Inspection of Kaiser–Meyer–Olkin (KMO) and Bartlett

Test of KMO and Bartlett		
KMOP value		0.756
Bartlett sphericity test	Approximate chi-square	851.158
	Df	120
	P value	0

4.2 Hypothesis test

The hypothetical path in Figure 1 is analyzed, as shown in Table 4.

Table 4. Summary of the regression coefficient of model

X	→	Y	Non-standardized path coefficient	SE	z (CR value)	p	Standardized path coefficient
Knowledge sharing willingness	→	learning ability	0.251	0.088	2.867	0.004	0.249
Knowledge sharing behavior	→	learning ability	0.085	0.042	2.006	0.045	0.154
Knowledge sharing willingness	→	"5G+AI" new technology	0.433	0.066	6.599	0.000	0.469
Knowledge sharing behavior	→	"5G+AI" new technology	-0.063	0.039	-1.635	0.102	-0.116
"5G+AI" new technology	→	learning ability	0.088	0.081	1.091	0.275	0.094

The following conditions are shown in Table 4.

Suppose H1 holds. Specifically, the willingness to share knowledge positively promotes the improvement of students' learning ability. A large number of studies have shown that individuals participating in knowledge sharing activities can improve other individuals' trust and recognition of themselves, improve other individuals' respect for themselves, and strengthen mutual relations with other individuals. Thus, the probability of knowledge sharing behavior among individuals will be higher. Social cognitive theory shows that the individual's expectation can promote his motivation. If the individual thinks that the target time will have a good result, then the higher the expectation for the target time, and the easier it is for the individual to act and do this thing. The willingness to share knowledge has a positive role in promoting students' daily adoption of mobile e-learning. In particular, the "5G+AI" new technology is an emerging technology. Students have more interest and potential to accept such education. They can enhance their willingness to share knowledge and form a learning group by strengthening knowledge sharing with others. Finding common hobbies can comprehensively improve students' learning ability and form good learning habits.

Suppose that hypothesis H2 holds. Knowledge sharing behavior is promoting the improvement of students' learning ability. Knowledge sharing behavior has an important effect on the improvement of students' learning ability. Individual students' cognition of their ability to receive the knowledge of online learning space, the ability to give others corresponding knowledge, the ability to help others, and the ability to skillfully use online learning space can affect individual knowledge sharing behavior. A large number of studies have proven that individuals in social identity are affected by the group's knowledge sharing atmosphere. Individuals are believed to behave in line with the group due to the sense of group belonging. When the group supports knowledge sharing behaviors, individuals will be consistent. Therefore, after a student accepts and absorbs online learning knowledge, he will completely improve the level of self-learning efficiency, stimulate students' interest and desire for learning from the heart, and gradually improve their learning ability in the learning process.

On the basis of the above results, this study further tests whether the new educational technology of "5G+AI" has mediating effect in promoting learning ability in the positive direction of knowledge sharing. We continue to analyze the mediating effect of hypotheses 3 and 4 Using Bootstrap technology used by Hayes and Andrew (2009). It can be seen from Table 5 that [19]:

Table 5. Intermediary effect model test

	learning ability	**"5G+AI" new technology**	**learning ability**
Constant	2.645** (10.079)	1.958** (8.301)	2.153** (6.949)
Knowledge sharing willingness.	0.069 (1.586)	-0.063 (-1.618)	0.085* (1.979)
Knowledge sharing behavior	0.197** (2.669)	0.433** (6.535)	0.088 (1.077)
"5G+AI" new technology	-	-	0.251** (2.829)
Adjust R^2	0.051	0.218	0.093
F value	F (2,150)=5.050,p=0.008	F (2,150)=22.177,p=0.000	F (3,149)=6.191,p=0.001

* p<0.05 ** p<0.01 the value of t is in brackets.

The following conditions are shown in Table 5.

Assuming that H3 is false, that is, the new educational technology of "5G+AI" has no mediating effect when the willingness to share knowledge positively promotes the improvement of learning ability. With the improvement of information system and the continuous progress of human–computer interaction technology, the learning cost of students using information system is decreasing, leading to the increasing potential requirements of students for the system quality of information system. When contemporary students grow up in the digital environment, most of them think that they can handle many types of information tasks, and they are unwilling to share knowledge about the new educational technology of "5G+AI," which in itself can promote the improvement of their learning ability. In online live teaching, we pay attention to the self-learning and knowledge sharing of students, so that students can participate more in the classroom and share knowledge. Therefore, under the new educational technology background of "5G+AI," all types of mobile and online learning platform service providers should provide users with stable, perfect, and high-quality information system platforms, and then promote students' willingness to share knowledge.

Hypothesis H4 is established, that is, the "5G+AI" new educational technology has an intermediary effect in the positive promotion of knowledge sharing behaviors in improving learning ability. With the maturity of the "5G+AI" new educational technology, knowledge sharing behavior can directly and positively affect students' learning ability. For example, a stable live teaching platform operating system and perfect mobile internet technology can optimize the quality of online live teaching, help students to reduce the isolation and technical difficulties in online live learning, and make users perceive that online live teaching is learning for themselves The value of research can directly promote students' willingness to learn independently and enhance their learning ability. This condition makes the "5G+AI" new educational technology play a completely intermediary role in the effect of learning ability.

5 Conclusion

In the process of education moving toward a high-quality development stage, 5G+AI technology will fully empower the education industry, restructuring and new integration of the subject, object, and elements of all levels of education and achieving teacher teaching quality and student learning performance The overall improvement is that 5G+AI technology can make learners acquire learning ability that is more suitable for social development and promote the optimization and improvement of teaching effect. As the main means of students' knowledge management and knowledge accumulation, knowledge sharing can promote students to complete the learning and absorption of knowledge and make network teaching resources obtain more full feedback and vitality, so as to improve students' learning ability in essence. Taking "5G+ AI" new technology as an intermediary variable, this study analyzes the effect mechanism of knowledge sharing on students' learning ability. The results show that knowledge sharing willingness positively promotes the improvement of students' learning ability. Knowledge sharing behavior positively promotes the improvement of students' learning ability. The new educational technology of "5G+AI" has a mediating effect on the positive promotion of learning ability in knowledge sharing behavior. The new technology of "5G+AI" can continue to make in-depth research on the learning ability of students at different levels and the learning efficacy of students at different grades. This technology can help to improve the positive evaluation of curriculum resources, trigger the behavior of continuous use, recommendation, and sharing, and promote the sharing of resources.

6 Acknowledgement

The study was supported by the Human resources and social security of Hebei Province in 2021, Topic name: Research on the cultivation of vocational core literacy of higher vocational college students; Project number: JRSHZ-2021-02111.

7 References

[1] Ensign, P. C. Innovation in the multinational firm with globally dispersed R&D: Technological knowledge utilization and accumulation. The Journal of High Technology Management Research, 1999, vol. 10(2), pp. 203-221. https://doi.org/10.1016/S1047-8310(99)00017-6

[2] Collins, C. J., & Smith, K. G. Knowledge exchange and combination: The role of human resource practices in the performance of high-technology firms. Academy of management journal, 2006, vol. 49(3), pp. 544-560. https://doi.org/10.5465/amj.2006.21794671

[3] Salopek, J. J., & Dixon, N. M. Common knowledge: How companies thrive by sharing what they know. Training & Development, 2000, vol. 54(4), pp. 63-64.

[4] Choi, B., & Lee, H. Knowledge management strategy and its link to knowledge creation process. Expert Systems with applications, 2002, vol. 23(3), pp. 173-187. https://doi.org/10.1016/S0957-4174(02)00038-6

[5] Kankanhalli, A., Tan, B. C., & Wei, K. K. Contributing knowledge to electronic knowledge repositories: An empirical investigation. MIS quarterly, 2005, pp. 113-143. https://doi.org/10.2307/25148670
[6] Law, C. C., & Ngai, E. W. An empirical study of the effects of knowledge sharing and learning behaviors on firm performance. Expert systems with applications, 2008, vol. 34(4), pp. 2342-2349. https://doi.org/10.1016/j.eswa.2007.03.004
[7] Eid, M. I., & Al-Jabri, I. M. Social networking, knowledge sharing, and student learning: The case of university students. Computers & Education, 2016, 99, pp. 14-27. https://doi.org/10.1016/j.compedu.2016.04.007
[8] Barak, M., & Rafaeli, S. On-line question-posing and peer-assessment as means for web-based knowledge sharing in learning. International Journal of Human-Computer Studies, 2004, vol. 61(1), pp. 84-103. https://doi.org/10.1016/j.ijhcs.2003.12.005
[9] Elmholdt, C. Knowledge management and the practice of knowledge sharing and learning at work: A case study. Studies in Continuing Education, 2004, vol. 26(2), pp. 327-339. https://doi.org/10.1080/158037042000225281
[10] OPINCARIU, M. Education in the 5Gand the AI context. Educația Plus, 2019, 23, pp. 97-103.
[11] Dake, D. K., & Adjei, B. 5Genabled technologies for smart education. International Journal of Advanced Computer Science and Applications, 2019, vol. 10(12), pp. 201-206. https://doi.org/10.14569/IJACSA.2019.0101228
[12] Liu, C., Wang, L., & Liu, H. 5Gnetwork education system based on multi-trip scheduling optimization model and artificial intelligence. Journal of Ambient Intelligence and Humanized Computing, 2021, pp. 1-14. https://doi.org/10.1007/s12652-021-03205-w
[13] Li, Z. Simulation of English education translation platform based on web remote embedded platform and 5Gnetwork. Microprocessors and Microsystems, 2021, 81, pp. 103775. https://doi.org/10.1016/j.micpro.2020.103775
[14] Yuen, S. C. Y., Yaoyuneyong, G., & Johnson, E. Augmented reality: An overview and five directions for AR in education. Journal of Educational Technology Development and Exchange, 2011, vol. 4(1), pp. 11. https://doi.org/10.18785/jetde.0401.10
[15] Salmi, H., Kaasinen, A., & Kallunki, V. Towards an open learning environment via augmented reality (AR), pp. Visualising the invisible in science centres and schools for teacher education. Procedia-Social and Behavioral Sciences, 2012, 45, pp. 284-295. https://doi.org/10.1016/j.sbspro.2012.06.565
[16] Hong, Y., Yang, J., Chen, Y., & Dong, H. Research on the Development of Online Education in the Age of AI and 5G. In 2021 2nd International Conference on Education, Knowledge and Information Management IEEE, 2021, pp. 233-237. https://doi.org/10.1109/ICEKIM52309.2021.00058
[17] Fang, Z. Construction planning of university discipline based on 5Gnetworks and Internet of Things system. Microprocessors and Microsystems, 2020, pp. 103430. https://doi.org/10.1016/j.micpro.2020.103430
[18] Bandura, A. Human agency in social cognitive theory. American psychologist, 1989, vol. 44(9), pp. 1175. https://doi.org/10.1037/0003-066X.44.9.1175
[19] Hayes, & F Andrew. Beyond baron and kenny: statistical mediation analysis in the new millennium. Communication Monographs, 2009, vol. 76(4), pp. 408-420. https://doi.org/10.1080/03637750903310360
[20] George E. Hein. Constructivist learning theory. Institute for Inquiry. Available at http://www.exploratorium.edu/ifi/resources/constructivistlearning, 1991.

[21] King, W. R., & Marks Jr, P. V. Motivating knowledge sharing through a knowledge management system. Omega, 2008, vol. 36(1), pp.131-146. https://doi.org/10.1016/j.omega.2005.10.006
[22] Khalil, O. E., & Shea, T. Knowledge sharing barriers and effectiveness at a higher education institution. International Journal of Knowledge Management, 2012, vol. 8(2), pp.43-64. https://doi.org/10.4018/jkm.2012040103
[23] Van Weert, T. J. Education of the twenty-first century: New professionalism in lifelong learning, knowledge development and knowledge sharing. Education and Information Technologies, 2006, vol. 11(3), pp. 217-237. https://doi.org/10.1007/s10639-006-9018-0
[24] Bibi, S., & Ali, A. Knowledge sharing behavior of academics in higher education. Journal of Applied Research in Higher Education. 2017, vol. 9(4), 550-564. https://doi.org/10.1108/JARHE-11-2016-0077
[25] Elrehail, H., Emeagwali, O. L., Alsaad, A., & Alzghoul, A. The impact of transformational and authentic leadership on innovation in higher education: The contingent role of knowledge sharing. Telematics and Informatics, 2018, vol. 35(1), pp. 55-67. https://doi.org/10.1016/j.tele.2017.09.018
[26] Ngulube, P. Improving the quality of research outputs in higher education through knowledge sharing and collaboration: a case study. Mousaion, 2005, vol. 23(1), pp. 39-61.
[27] Bock, G. W., & Kim, Y. G. Breaking the myths of rewards: An exploratory study of attitudes about knowledge sharing. Information Resources Management Journal, 2002, vol. 15(2), pp. 14-21. https://doi.org/10.4018/irmj.2002040102
[28] Chen, C., Kun, S., Yaping, W., & Yue, W. The Construction and Discussion of Smart Learning Environment in the Context of 5G. In 2020 International Conference on Big Data, Artificial Intelligence and Internet of Things Engineering, IEEE, 2020, pp. 190-193. https://doi.org/10.1109/ICBAIE49996.2020.00047
[29] Gao Y. A Survey Study on the Application of Modern Educational Technology in English Major College Teaching in the Age of 5GCommunication. Theory and Practice in Language Studies, 2021, vol. 11(2), pp. 202-209. https://doi.org/10.17507/tpls.1102.13

8 Author

Jie Zhao is a Lecturer in Hebei University of Engineering, Handan, 056038, China.

Article submitted 2021-10-18. Resubmitted 2021-11-28. Final acceptance 2021-12-02. Final version published as submitted by the author.