Online Sharing Mechanism of Digital Teaching Resources Considering Knowledge Potential Difference

https://doi.org/10.3991/ijet.v18i09.40231

Yina Peng[1], Zhigang Tan[2](✉)
[1]Hunan Vocational College of Engineering, Changsha, China
[2]The Second Xiangya Hospital of Central South University, Changsha, China
tzgcs100@163.com

Abstract—The rapid development of emerging technologies, such as the Internet, big data, and artificial intelligence, has provided the technical foundation and conditions for digital online education resources. Knowledge potential difference has been ignored in current studies on teaching resource sharing, which cannot effectively meet the specific learning needs of students with different cognitive levels, and reduces their participation. Therefore, this paper studied the online sharing mechanism of digital teaching resources considering knowledge potential difference. This paper conducted and analyzed an online sharing model of learning resources between teachers and students considering knowledge potential difference, and described in detail the assumptions and steps for constructing the model. Then this paper constructed an effectiveness evaluation index system for the online sharing mechanism of digital teaching resources considering knowledge potential difference, and elaborated the specific steps for evaluating the effectiveness of the mechanism based on extension evaluation method. Experiment results verified the effectiveness of the proposed modeling and evaluation method.

Keywords—knowledge potential difference, digital teaching resources, online resource sharing mechanism, effectiveness evaluation

1 Introduction

With rapid development of information technology and widespread application of the Internet, online sharing of digital teaching resources has become an important trend in the field of education today [1–6]. This sharing mechanism converts traditional paper teaching materials and multimedia teaching resources into digital formats, which provides teachers and students with a convenient and efficient way to access and utilize educational resources [7–11], offers interactive functions, such as real-time communication, online discussion, and questions and answers, and supports knowledge sharing and collaborative learning between teachers and students [12–17], thus helping improve teaching quality, and promoting knowledge dissemination and educational equality [18–24]. Research on the online sharing mechanism of digital teaching resources helps people understand the internal mechanism of teaching resources sharing behavior

between teachers and students, and deepens the research on behavioral subjects of both parties, thus laying a theoretical foundation for the sustainable development of their knowledge sharing and transfer.

Zhang [25] designed a new platform and algorithm to allocate online teaching resources based on new media platforms, planned the teaching resource attributes of orchestral music major, and studied the optimal solution of resource sharing game model in heterogeneous network distributed scenario based on load balancing and honest allocation principles. Experiment showed that this strategy greatly reduced network requirements, which made the designed algorithm available for actual creation, development, and deployment. Wen [26] analyzed the sharing of English educational resources using ubiquitous learning resource sharing platforms and neural networks. Due to better classification and prediction functions, Back Propagation (BP) neural network algorithm classified and predicted information in the English teaching resource sharing. Based on the theoretical Integrative Model of Behavior Prediction (IMBP) and behavioral motive theory, Wang [27] designed the influencing factor scale of sharing digital teaching resources by teachers in online teaching activities, and then discussed the main influencing factors. Results showed that the designed questionnaire had good reliability and validity. Sharing motives and self-efficacy had a significant positive impact on the sharing behavior of teachers in online teaching activities. In order to improve the sharing effect of online oral teaching resources, Cai and Peng [28] considered resource sharing between tasks in hybrid key system based on fixed task priority scheduling, extended the traditional Priority Ceiling Protocol (PCP), and proposed the resource sharing protocol suitable for the AMC scheduling model in verifiable hybrid critical system. With the support of deep learning, the worst blocking time and response time of tasks at each stage were analyzed. Experimental research results indicated that the method of sharing English oral online teaching resources based on deep learning had good resource sharing effects. Wang [27] discussed specific issues, such as platform module design, system inspection, application forms and so on, in order to provide a reference for establishing an university education resource sharing platform. Based on the overall and functional requirements, the platform allowed teachers and students to access personalized digital resources on demand for reading, downloading, printing and sharing.

Knowledge potential difference refers to the difference of users in knowledge level, background, and experience. In the online sharing process of digital teaching resources, taking knowledge potential difference into consideration helps provide appropriate learning resources for users with different knowledge levels, thus reducing the knowledge gap and improving educational equality. Ignoring knowledge potential difference, existing research on knowledge sharing cannot effectively meet the specific learning needs of students with different cognitive levels and reduces their participation. Therefore, this paper did research on the online sharing mechanism of digital teaching resources considering knowledge potential difference. Chapter 2 conducted and analyzed an online sharing model of learning resources between teachers and students considering knowledge potential difference, and described in detail the assumptions and steps for constructing the model. Chapter 3 constructed an effectiveness evaluation index system for the online sharing mechanism of digital teaching resources considering

knowledge potential difference, and elaborated the specific steps for evaluating the effectiveness of the mechanism based on extension evaluation method. Experiment results verified the proposed modeling and evaluation method were effective.

2 Construction and analysis of online sharing model of learning resources between teachers and students considering knowledge potential difference

In the process of knowledge interaction between teachers and students, both parties exchange knowledge through specific digital learning resources in a non-material form, thus achieving mutual benefit. In this mode, teachers help students improve their abilities and qualities through online learning resources sharing, and students express their gratitude and appreciation for the knowledge they have learned by trusting and respecting teachers. Although there is no direct economic compensation in this sharing process, economic theory believes that non-material and monetary incentives have the same effect to some extent. In other words, teachers gain trust and respect from students by providing knowledge and skills, which can be seen as a non-material payment. This payment not only enhances the professional achievement and satisfaction sense of teachers, but also helps establish stable and lasting teacher-student relationships. Students also benefit greatly from the professional knowledge and skills of teachers in this process, and gradually grow into more competitive and independent individuals. This non-material return can be understood as the growth and development gained by students in the knowledge sharing process.

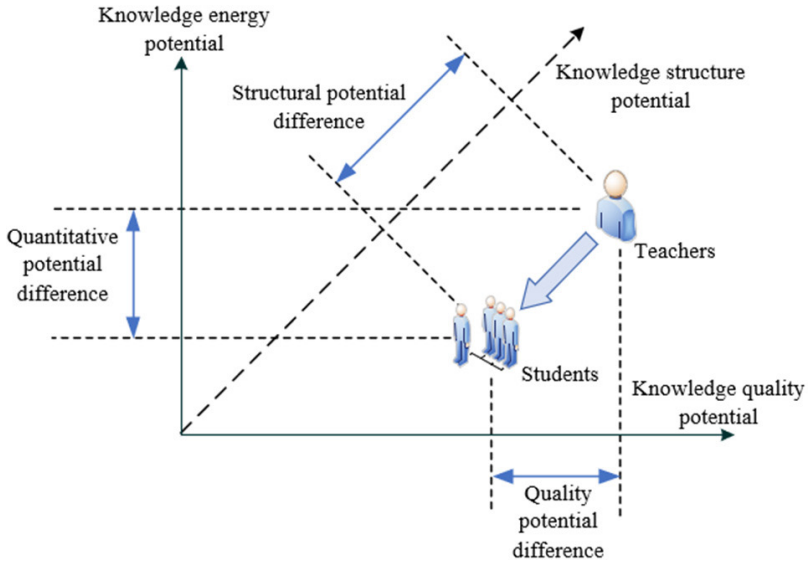

Fig. 1. Schematic diagram of knowledge potential difference between teachers and students

This paper first made the following assumptions in order to build an accurate online sharing model of learning resources between teachers and students:

Assumption 1: Let K be the unchanged amount of shared learning resources of teachers in a short period of time, n be the proportion of willingly shared learning resources, nL be the actually contributed learning resources by teachers, m be students' absorptive capacity of learning resources shared by teachers, and $\Delta L=nmL$ be the amount of actually learned learning resources by students.

Assumption 2: Knowledge potential difference was an important factor in the knowledge sharing process of teachers and students. Figure 1 shows a schematic diagram of the knowledge potential difference between both parties. By default, teachers had more knowledge, experience, and skills in a certain field, while students were relatively lacking. Therefore, potential difference existed between teachers and students in terms of knowledge structure, quantity, and quality. Figure 2 shows four kinds of knowledge potential difference between them, namely, mutually disjoint, inclusive, crossed, and overlapping. Knowledge potential difference provided complementary opportunities for both parties, and made online sharing of learning resources possible.

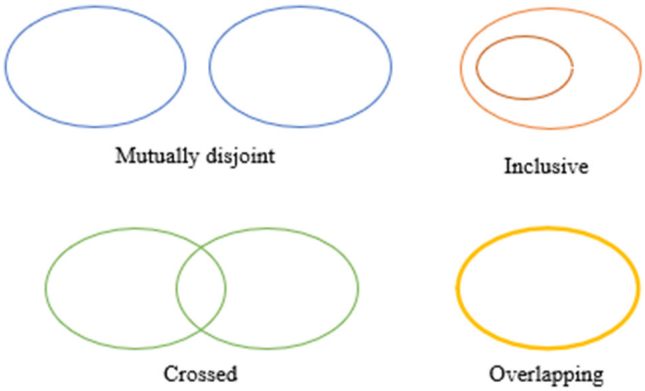

Fig. 2. Four kinds of knowledge potential difference between teachers and students

Assumption 3: According to the capacity theory, learning resources determined the amount of knowledge, which determined the level of capacity. Therefore, competency evaluation was a function of the amount of learning resources available. It was assumed that the learning resource capability evaluation function of students was in linear form, and set as $\tau=\Delta L+\omega$, where ω was caused by exogenous random uncertain variables and satisfied $\omega\sim(0,\varepsilon^2)$. Let γ be students' feedback rate of learning resources contributed by teachers, then the spiritual rewards obtained by teachers were represented by $R=\gamma\tau=\gamma nmL$.

Assumption 4: Let y_1 and y_2 be the learning resource transfer and learning cost coefficients of teachers and students. Larger y indicated that teachers and students must pay more costs and efforts to achieve the sharing of learning resources. Teachers

needed to pay a certain amount of labor and time costs to organize and transfer learning resources ΔL to students. Let $D_1(nmL)=y_1(nmL)^2/2$ be the cost function and, similarly, $D_2(nmL)=y_2(nmL)^2/2$ be the labor cost function when students learned the learning resources ΔL.

Assumption 5: The possibility that students did not understand learning resources was defined as risk neutral, and teachers needed to consider avoiding this risk. Let δ be the absolute risk avoidance degree of teachers and θ be the sharing utility of actual learning resources, then the utility function of learning resources shared by teachers satisfied $V=-p^{-\delta\theta}$. Figure 3 shows the impact mechanism of knowledge potential difference on risks of not understanding resources. In this model diagram, knowledge potential difference was no longer subdivided into three dimensions, namely, knowledge structure, quantity, and quality, for analysis. Instead, impact analysis was made by fully considering absolute risk avoidance degree of teachers and the pursuit of learning resource sharing effectiveness, i.e., by dividing knowledge potential difference into different paths.

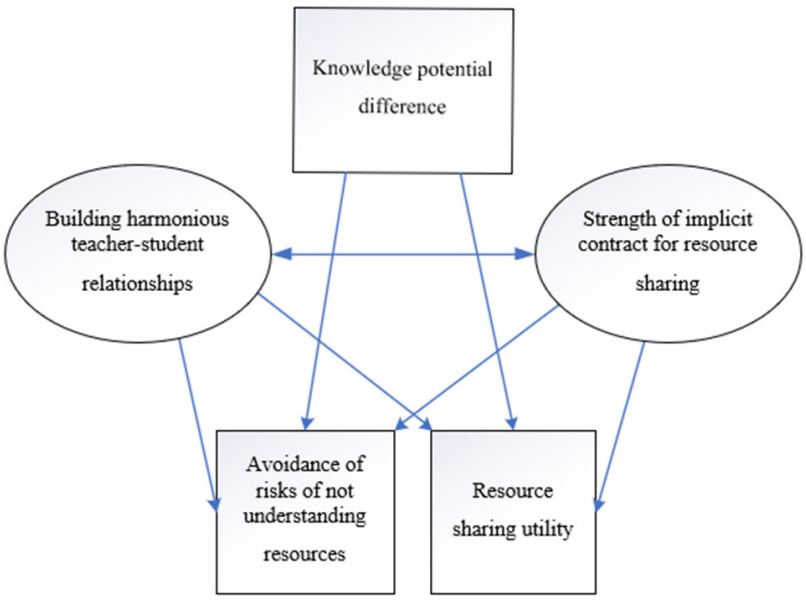

Fig. 3. Impact model of knowledge potential difference on risks of not understanding resources

Based on the above assumptions, the learning resource sharing utility of teachers was determined by:

$$P_1 = P(R) - D_1(nmL) - \delta\gamma^2\varepsilon^2/2 = \gamma nmL - y_1(nmL)^2/2 - \delta\gamma^2\varepsilon^2/2 \quad (1)$$

The learning resource sharing utility expected by students was:

$$P_2 = P(\tau - R) - D_2(nmL) = (1-\gamma)nmL - \mathrm{y}_2(nmL)^2/2 \quad (2)$$

In the case of asymmetric information, students did not know the actual learning resources contributed by teachers, and enabled their teachers towards sharing more knowledge, experience and skills only by trusting and respecting them more. In order to ensure access to more learning resources, students tried to maintain closer emotional connections with teachers, enhanced the strength of implicit contracts with them, and hoped teachers gained more professional achievement and satisfaction sense, thus ultimately prompting teachers to increase the amount of shared learning resources ΔL. Based on considering maintaining harmonious teacher-student relationships, teachers increased their own influence, and enhanced the value of their own learning resources, thus determining the optimal sharing coefficient to maximize their learning resource sharing utility, which should not be lower than their minimum reserved utility v_1. The relevant mathematical model expressions were given below:

$$\underset{\gamma}{Max}(1-\gamma)nmL - y_2(nmL)^2/2 \tag{3}$$

$$s.t(IC)\underset{n}{Max}\gamma nmL - y_1(nmL)^2/2 - \delta\gamma^2\varepsilon^2/2 \tag{4}$$

$$(IR)\gamma nmL - y_1(nmL)^2/2 - \delta\gamma^2\varepsilon^2/2 \geq \vartheta_1 \tag{5}$$

To obtain the first order condition of Equation 4, there were:

$$m = \beta/b_1 nK \; n = \gamma/y_1 mL \tag{6}$$

If teachers actively shared learning resources, students no longer spent more energy maintaining closer emotional connections and enhancing the strength of implicit contracts with them. Therefore, the equal sign of Equation 5 held, there was:

$$-\gamma nmL = -y_1(nmL)^2/2 - \delta\gamma^2\varepsilon^2/2 - v_1 \tag{7}$$

The above equation and Equation 6 were substituted into Equation 3, then the expression of the maximum learning resource sharing utility of students was given by:

$$Max\gamma/y_1 - y_2\gamma^2/2y_1 - \delta\gamma^2\varepsilon^2/2 - v_1 \tag{8}$$

To obtain the first order condition of the above equation, there was:

$$\gamma = y_1/(y_1 + y_2 + y_1^2\delta\varepsilon^2) \tag{9}$$

When the above formula was combined with Equation 6, there was:

$$\Delta L = 1/(y_1 + y_2 + y_1^2\delta\varepsilon^2) \tag{10}$$

Analysis of γ and ΔL showed that γ was the decreasing function of y_2 and δ, indicating that teachers had higher risk avoidance degree when sharing online learning resources with students with higher learning costs. In order to ensure obtaining certain knowledge by learning the learning resources, the proportion of online resource sharing that students

gave back to teachers remained at a lower level. ΔL was the decreasing function of y_1, y_2, δ and ε^2, indicating that the higher the transfer costs of learning resources of teachers, the greater the risks that students did not understand the learning resources, and the lower the willingness of teachers to share learning resources. With the increase of learning costs of students y_2 to a certain extent, the ability evaluation and the learning resource sharing utility obtained by teachers reduced. Therefore, the learning costs of students had a negative impact on the amount of learning resources transferred by teachers.

3 Effectiveness evaluation of online sharing mechanism of digital teaching resources considering knowledge potential difference

In the current era of knowledge economy, the necessity of sharing learning resources between teachers and students has become increasingly prominent. Improving the effectiveness of knowledge sharing is crucial for improving the organization's knowledge stock and innovation performance. To implement learning resource sharing well, it is necessary to integrate it into the daily work and learning process of teachers and students. That is, learning resource sharing and knowledge transfer are integrated into existing processes, as shown in Figure 4. However, due to lack of tracking, feedback, and evaluation mechanism, current learning resource sharing led to relatively weak sharing relationships and implicit contract strength between teachers and students. In order to solve this problem, it is urgent to establish a feasible evaluation index system for the effectiveness of online teaching resource sharing and knowledge transfer, thus standardizing the knowledge sharing relationships between teachers and students, optimizing their knowledge transfer, stimulating their innovative potential, and promoting the sustainable development of their knowledge sharing and transfer.

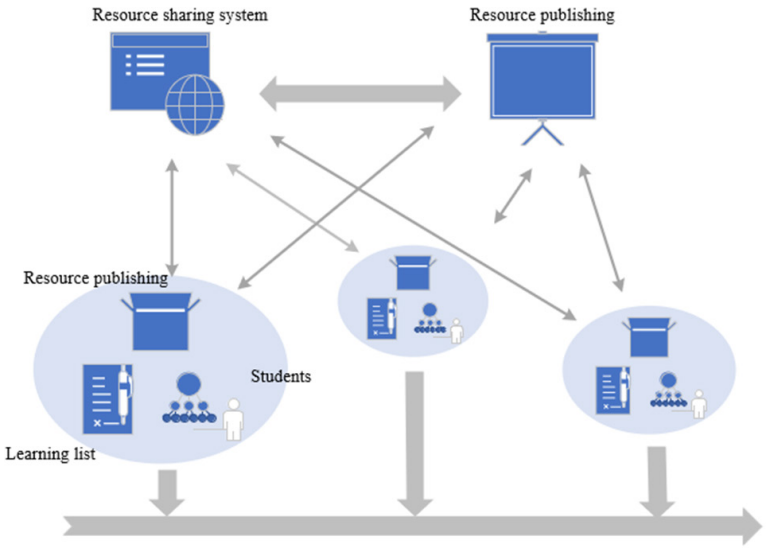

Fig. 4. Integrating learning resource sharing and knowledge transfer into existing processes

Based on the extenics principle, extension evaluation method fully considers the multi-dimensionality, uncertainty, and extensibility of objective things. When applied to evaluate the online sharing effectiveness of digital teaching resources, the extension evaluation method has several advantages, such as balancing qualitative and quantitative analysis, adapting to complex and uncertain environments, high flexibility, strong objectivity, and easy understanding and operation. These advantages help evaluate the online sharing effectiveness more comprehensively and accurately, and provide strong support for optimizing shared resources and improving teaching quality. This paper elaborated the specific steps for effectiveness evaluation of the online sharing mechanism considering knowledge potential difference based on extension evaluation method.

When evaluating the effectiveness of the online sharing mechanism, multiple specific indicators needed to be considered comprehensively, including knowledge potential difference, resource quality, technical support, user satisfaction, and promotion and influence. First, the standards of knowledge potential difference included resource adaptability, learning path design, interaction and support, and teaching resource differentiation. These indicators indicated whether resource sharing met the needs of students with different knowledge levels and backgrounds, whether personalized learning paths were provided for students with different knowledge levels, whether effective interactive methods for resource sharing between teachers and students were provided (e.g. forums, questions and answers, and online tutoring, etc.), whether differentiated teaching resources were provided for users with different knowledge levels and backgrounds, thus meeting their specific needs.

The standards of resource quality included content accuracy, content update frequency, diversity, and usability, which reflected the correctness, timeliness, richness, and easy utilization of the teaching resource content provided by teachers. Second, evaluation indicators of technical support included the stability, easy operation, search function, and data security and privacy protection of online sharing platforms, which had an important impact on user experience and trust. In addition, user satisfaction was also a key indicator of online sharing mechanism effectiveness, including feedback from teachers and students, participation, and growth, which represented their satisfaction with resource sharing, the activity level of online platforms, and the resource contribution to the improvement of user knowledge and skills. Finally, indicators of promotion and influence, such as coverage area, cooperation, and communication, reflected the potential for building shared relationships between both parties and their recognition of the shared relationships.

4 Experiment results and analysis

This paper did relevant research by taking online English teaching as an example. According to the data in Figure 5, the number of new digital English learning resources has shown a significant upward trend from the first quarter (JD1) of 2021, mainly because related online sharing mechanism was established and used during this period. Due to high convenience of this tool, teachers and students shared and accessed

digital teaching resources more easily, resulting in a rapid growth in the number of resources. In addition, a sharp increase occurred from the second quarter (JD2) of 2021, mainly because previously accumulated learning resources were released at this time. Therefore, the later changes needed to be paid close attention in order to more accurately evaluate the sustainability of the growth trend in the number of new digital English learning resources.

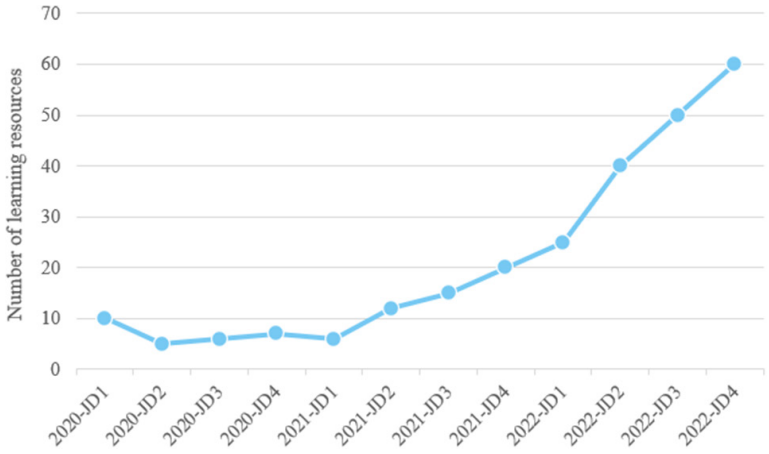

Fig. 5. Variation trend of the number of new digital learning resources

According to the data in Figure 5, the online sharing mechanism of digital teaching resources has brought significant convenience to teachers and students in English major, and teachers' enthusiasm for sharing resources has also greatly improved. The rapid growth in the number of resources showed the mechanism actively promoted knowledge dissemination between teachers and students and improved the learning efficiency of students.

The online sharing mechanism of digital teaching resources considering knowledge potential difference provided teachers and students with convenient access to various learning resources. For example, students marked in time and asked questions about words or grammar points in actual English interaction scenario during English reading, and teachers also easily responded to questions raised by students. With the integration of mechanism into existing processes, learning resources were increasingly visible to students with different cognitive levels. More students marked, commented, asked questions and so on during English reading through the mechanism, making it easier for teachers to obtain feedback from students. Figure 6 shows the variation trend in the number of new resources used and evaluated. According to the figure, the mechanism has effectively improved the interaction frequency between teachers and students with different cognitive levels, and has also improved the sharing effectiveness. With the increase in the number of hits and evaluations of new resources, students achieved higher learning resource sharing utility, and teachers were more inclined to continue sharing in order to increase their own influence and enhance their own resources.

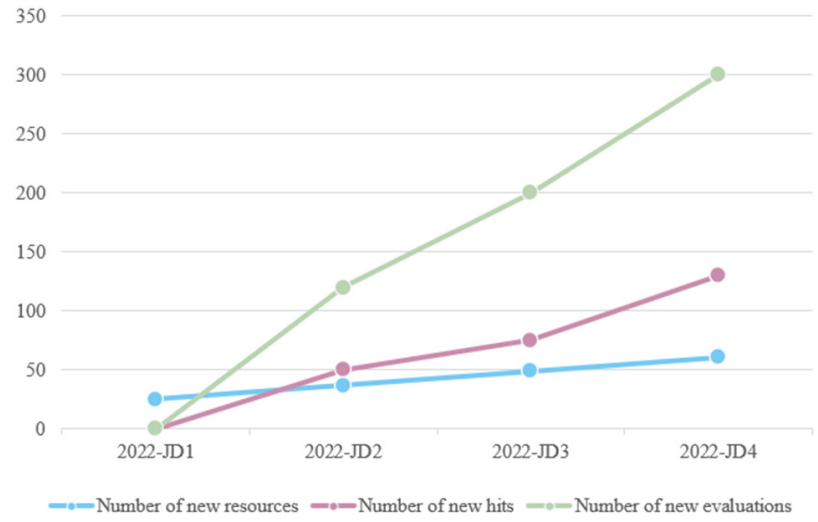

Fig. 6. Variation trend in the number of new digital learning resources used and evaluated

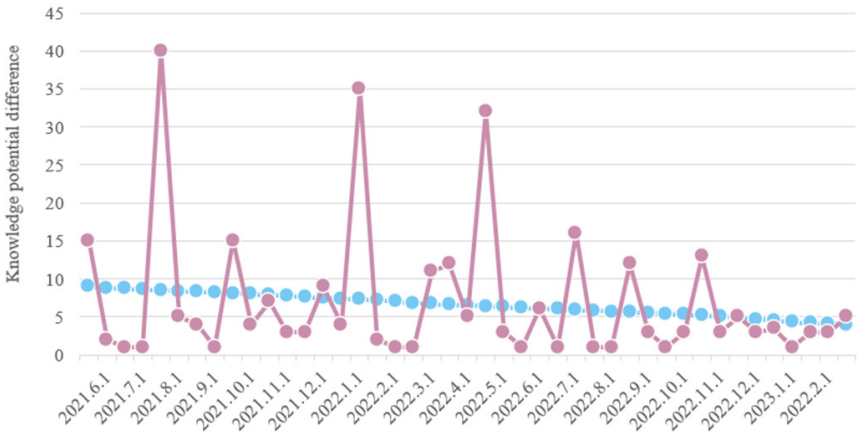

Fig. 7. Variation trend of knowledge potential difference between teachers and students

Figure 7 shows the variation trend of knowledge potential difference between teachers and students. Although the mechanism implementation did not mean that the knowledge potential difference between teachers and students was well suppressed, the variation trend of knowledge potential difference showed that the trend had positive correlation with the mechanism optimization. That is, the mechanism considering knowledge potential difference may be of positive significance to reducing the knowledge potential difference between teachers and students to some extent.

Table 1. Impact of knowledge potential difference on absolute risk avoidance degree of teachers

Dependent Variable	Absolute Risk Avoidance Degree of Teachers			
	Sample 1	**Sample 2**	**Sample 3**	**Sample 4**
Control variable				
Knowledge potential difference	0.021	0.004	0.003	–0.004
Resource quality	0.023	0.023	0.034	0.027
Technical support	–0.027	–0.013	–0.045	–0.035
User satisfaction	0.015	0.020	0.011	0.041
Promotion and influence	0.012	0.015	0.015	0.009
Independent variable				
Absolute risk avoidance degree	/	0.325***	0.274***	0.265***
Moderator variable				
Learning resource sharing utility	/	/	0.210	0.120
Building of harmonious teacher-student relationships	/	/	–0.359***	–0.356***
Moderating effect				
Risk avoidance×learning resource sharing utility	/	/	/	0.029
Risk avoidance×building of harmonious teacher-student relationships	/	/	/	–0.197**
Statistics				
R-squared	0.003	0.131	0.221	0.354
Adjusted *R-squared*	–0.015	0.087	0.201	0.341
Variation of *R-squared*	0.006	0.131	0.134	0.041
F	0.124	6.255	9.546	8.641
Variation of *F*	0.134	24.465***	14.920***	4.448*
DW	/	/	/	2.134

This paper further discussed the impact of knowledge potential difference on absolute risk avoidance of teachers. Experiment results of different samples are shown in Table 1. According to the table, for Sample 1, the avoidance degree of teachers has not been significantly affected by several indexes as control variables, namely, knowledge potential difference, resource quality, technical support, user satisfaction, and promotion and influence. Sample 2 introduced regression equation of the independent variable absolute risk avoidance degree. It can be seen that the standardized regression coefficient of knowledge potential difference for the avoidance degree of teachers has reached a significant level at 0.001, indicating that knowledge potential difference has a significant positive impact on the avoidance degree. Based on Sample 2, two moderator variables were added to Sample 3, namely, learning resource sharing utility and building of harmonious teacher-student relationships. It can be seen that only the standardized regression coefficient of harmonious teacher-student relationship building for the avoidance degree has reached a significant level at 0.001.

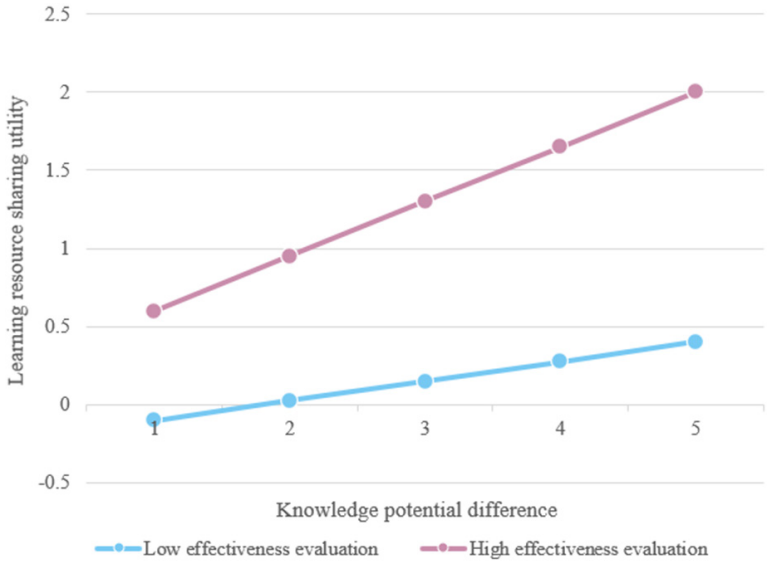

Fig. 8. Impact of knowledge potential difference on learning resource sharing utility

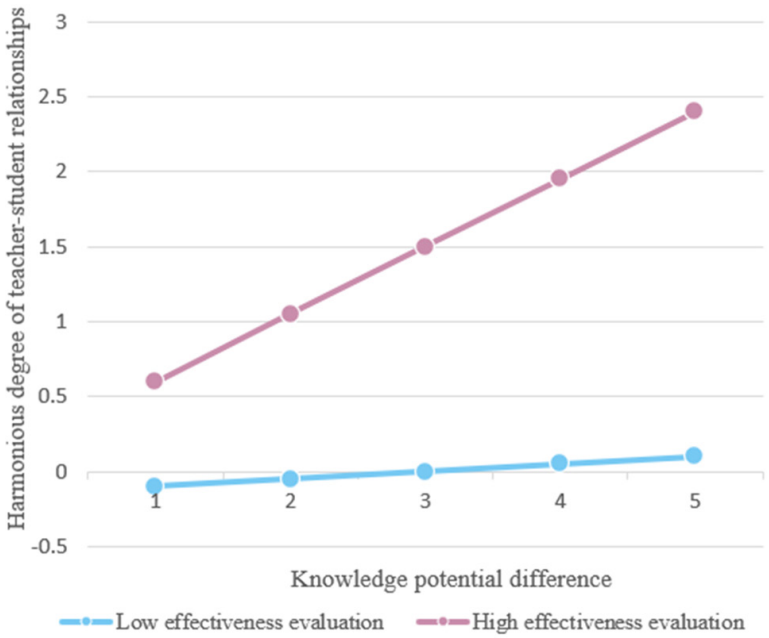

Fig. 9. Impact of knowledge potential difference on the harmonious degree of teacher-student relationships

Based on Sample 3, two moderating effect was added to Sample 4, namely, risk avoidance×learning resource sharing utility, and risk avoidance×building of harmonious teacher-student relationships. It can be seen from the table that corresponding P value of only risk avoidance×building of harmonious teacher-student relationships has reached a significant level at 0.001, indicating that this moderating effect has a significant negative impact on the avoidance degree. While the other moderating effect has no significant impact on the avoidance degree. Therefore, building harmonious teacher-student relationships weakened the positive impact of knowledge potential difference on the avoidance degree, and the moderating role of learning resource sharing utility in the positive impact was negligible. The corresponding moderating effect diagrams are shown in Figures 8 and 9.

Figures 8 and 9 also compare the degree of learning resource sharing utility and harmonious teacher-student relationships building being affected in low and high effectiveness evaluation. Optimization scheme of online sharing mechanism of digital teaching resources was actually implemented relatively late step by step, and the overall implementation duration was not long. Therefore, effectiveness evaluation only relied on evaluation indicator data collected within a limited period of time. However, according to the impact results in Figures 8 and 9 and the changes in the number of learning resources, hits and evaluations in Figures 5 and 6, the mechanism considering knowledge potential difference has a very positive impact on knowledge sharing between teachers and students.

5 Conclusion

This paper studied the online sharing mechanism of digital teaching resources considering knowledge potential difference. When conducting and analyzing an online sharing model of learning resources between teachers and students considering knowledge potential difference, this paper described in detail the assumptions and steps for constructing the model. Then when constructing an effectiveness evaluation index system for the online sharing mechanism of digital teaching resources considering knowledge potential difference, this paper elaborated the specific steps for evaluating the mechanism effectiveness based on extension evaluation method. This paper did experimental research by taking online English teaching as an example. In addition, the paper discussed the variation trend of the number of new digital learning resources, the resources used and evaluations, and verified that the mechanism may have positive significance in reducing the knowledge potential difference between teachers and students to some extent. Furthermore, this paper discussed the impact of knowledge potential difference on absolute risk avoidance degree of teachers, and presented experiment results of different samples. Finally, experiment results verified the proposed modeling and evaluation method was effective.

6 References

[1] Jalinus, N., Ganefri, Zaus, M.A., Wulansari, R.E., Nabawi, R.A., Hidayat, H. (2022). Hybrid and collaborative networks approach: Online learning integrated project and Kolb learning style in mechanical engineering courses. International Journal of Online and Biomedical Engineering, 18(15): 4–16. https://doi.org/10.3991/ijoe.v18i15.34333

[2] Nuankaew, P. (2022). Self-regulated learning model in educational data mining. International Journal of Emerging Technologies in Learning, 17(17): 4–27. https://doi.org/10.3991/ijet.v17i17.23623

[3] Yamunah Vaicondam, Huma Sikandar, Sobia Irum, Nohman Khan, Muhammad Imran Qureshi. (2022). Research landscape of digital learning over the past 20 years: A bibliometric and visualisation analysis. International Journal of Online and Biomedical Engineering, 18(8): 4–22. https://doi.org/10.3991/ijoe.v18i08.31963

[4] ZhuGe, X., Cao, H. (2022). Data sharing method of college dance teaching resource database based on PSO algorithm. Computational Intelligence and Neuroscience, 2022: Article ID 2162981. https://doi.org/10.1155/2022/2162981

[5] He, J., Lin, K.Y., Dai, Y. (2022). A data-driven innovation model of big data digital learning and its empirical study. Information Dynamics and Applications, 1(1): 35–43. https://doi.org/10.56578/ida010105

[6] Zalli, M.M.M., Nordin, H., Awang Hashim, R. (2020). Online self-regulated learning strategies in MOOCs: A measurement model. International Journal of Emerging Technologies in Learning, 15(8): 255–263. https://doi.org/10.3991/ijet.v15i08.12401

[7] Bing, L. (2022). Design of English teaching corpus resource-sharing system based on XML technology. Mathematical Problems in Engineering, 2022: Article ID 7962668. https://doi.org/10.1155/2022/7962668

[8] Hou, Z. (2022). Remote English teaching resource sharing based on internet O2O model. Scientific Programming, 2022: Article ID 1217807. https://doi.org/10.1155/2022/1217807

[9] Li, B. (2022). Online music teaching resource sharing algorithm based on blockchain technology. International Journal of Emerging Technologies in Learning (Online), 17(24): 69–86. https://doi.org/10.3991/ijet.v17i24.35373

[10] Ma, H. (2021). Design and application of teaching resources sharing platform for physical education major based on Internet. In Journal of Physics: Conference Series, 1992(2): 022197. https://doi.org/10.1088/1742-6596/1992/2/022197

[11] Zheng, W., Muthu, B., Kadry, S.N. (2021). Research on the design of analytical communication and information model for teaching resources with cloud-sharing platform. Computer Applications in Engineering Education, 29(2): 359–369. https://doi.org/10.1002/cae.22375

[12] Yun, L.J., Li, M.S. (2021). Design of Online sharing system for college writing teaching resources in the media age. In e-Learning, e-Education, and Online Training: 7th EAI International Conference, eLEOT 2021, Xinxiang, China, pp. 193–204. https://doi.org/10.1007/978-3-030-84386-1_16

[13] Feng, Y., Zhan, G., Li, Z. (2019). Research on the Co-construction and Sharing of Teaching Resources under the "Internet plus" Environment. In 2019 10th International Conference on Information Technology in Medicine and Education (ITME) Qingdao, China, pp. 498–502. https://doi.org/10.1109/ITME.2019.00117

[14] Dong, L.N., Liu, J.W. (2021). Design of security sharing system for online teaching course resources of fine arts specialty. In e-Learning, e-Education, and Online Training: 7th EAI International Conference, eLEOT 2021, Xinxiang, China, pp. 252–263. https://doi.org/10.1007/978-3-030-84386-1_21

[15] Chen, L., Feng, T., Fan, D. (2020). Construction of a sharing model for network digital teaching resources oriented to big data. International Journal of Continuing Engineering Education and Life Long Learning, 30(2): 190–203. https://doi.org/10.1504/IJCEELL.2020.106343

[16] Wang, W. (2020). An empirical analysis of the key factors affecting the inter school sharing of regional digital teaching resources. In 2020 2nd International Conference on Information Technology and Computer Application (ITCA), Guangzhou, China, pp. 712–715. https://doi.org/10.1109/ITCA52113.2020.00153

[17] Gan, B., Deng, F., Zhang, C., Li, J. (2019). Construction and application of information-based teaching resources sharing platform based on deep learning. In 2019 4th International Conference on Mechanical, Control and Computer Engineering (ICMCCE), Hohhot, China, pp. 634–6343. https://doi.org/10.1109/ICMCCE48743.2019.00147

[18] He, L. (2022). Ideological and political teaching resource sharing method based on edge computing. Wireless Communications and Mobile Computing, 2022: Article ID 3907721. https://doi.org/10.1155/2022/3907721

[19] Duan, D., Xiang, C. (2022). The design and implementation of virtual simulation teaching resource management and sharing platform. In 2022 10th International Conference on Information and Education Technology (ICIET), Matsue, Japan, pp. 11–15. https://doi.org/10.1109/ICIET55102.2022.9779020

[20] Su, X.Y., Li, C.D., Lai, I.K.W. (2018). An exploration on the regional sharing mechanism for high-quality online teaching resources of colleges and universities in the internet era. In Technology in Education. Innovative Solutions and Practices: Third International Conference, ICTE 2018, Hong Kong, China, pp. 276–284. https://doi.org/10.1007/978-981-13-0008-0_26

[21] Jia, Z.L. (2021). On sharing of college physical education network course and network teaching resource under the background of collaborative innovation strategy. In 2021 International Conference on Information Technology and Contemporary Sports (TCS), Guangzhou, China, pp. 384–387. https://doi.org/10.1109/TCS52929.2021.00084

[22] Cai, H., Men, Y.F. (2021). Design of intelligent cloud teaching resource sharing platform for Chinese and Korean modern ceramic art. In e-Learning, e-Education, and Online Training: 7th EAI International Conference, eLEOT 2021, Xinxiang, China, pp. 241–251. https://doi.org/10.1007/978-3-030-84386-1_20

[23] Xu, F. (2021). Digital English teaching resource sharing system based on logical database. International Journal of Information and Communication Technology, 18(4), 351–370. https://doi.org/10.1504/IJICT.2021.115590

[24] Li, R. (2022). Algorithm design for sharing orchestral network teaching resources using new media platform. Mobile Information Systems, 2022: Article ID 7238554. https://doi.org/10.1155/2022/7238554

[25] Zhang, L. (2022). Sharing of teaching resources for English majors based on ubiquitous learning resource sharing platform and neural network. Computational Intelligence and Neuroscience, 2022: Article ID 2683008. https://doi.org/10.1155/2022/2683008

[26] Wen, L. (2022). Influencing factors of teachers' sharing behaviors of digital teaching resources in online teaching activities. International Journal of Emerging Technologies in Learning, 17(6): 95–109. https://doi.org/10.3991/ijet.v17i06.29465

[27] Wang, Z. (2022). Integration and sharing of college English teaching resources using cloud computing platform. Mobile Information Systems, 2022: Article ID 8202229. https://doi.org/10.1155/2022/8202229

[28] Cai, W., Peng, Y. (2022). Sharing method of online teaching resources of spoken English based on deep learning. Journal of Electrical and Computer Engineering, 2022: Article ID 9520630. https://doi.org/10.1155/2022/9520630

7 Authors

Yina Peng graduated from the foreign language department of Hunan First Normal University in 2013 with a bachelor's degree. In 2017, she graduated from the school of foreign languages of Hunan University with a master's degree in English literature. Now she is a lecturer of English Department in Hunan Vocational College of Engineering. Her research interests include Teaching methodology and English literature. Email: Zoeaustine@163.com, https://orcid.org/0009-0006-3434-7119

Zhigang Tan graduated from the School of Medicine of Hunan Normal University in 2012 with a bachelor's degree. In 2015, he graduated from Xiangya School of Medicine with a master's degree. In 2018, he obtained doctor's degree from Xiangya School of Medicine of Central South University in neurosurgery. Now he is a attending physician in neurosurgery department in The Second Xiangya Hospital of Central South University. His research interests include functional neurosurgery and Intracranial Tumors. Email: tzgcs100@163.com, https://orcid.org/0009-0009-3914-5569

Article submitted 2023-01-28. Resubmitted 2023-04-01. Final acceptance 2023-04-05. Final version published as submitted by the authors.