ISSN 2522-6398 Vol. 7, Issue 10: 93-98, DOI: 10.25236/FER.2024.071015

Application of Personalized Learning Resource Push in Teaching

Pan Shanshan

School of Business Administration, Xi'an Eurasia University, Xi'an, China

Abstract: *Today's teaching methods pay more and more attention to personalized learning, and the introduction of personalized learning resource push has become a relatively new teaching mode. Through the analysis of learning process data, we can accurately grasp students' mastery of each knowledge point, and recommend personalized learning resources according to their needs, so as to improve students' learning efficiency and personalized learning experience.*

Keywords: *learning resources push; learning process; personalized learning*

1. Introduction

1.1. Research background

After "Chinese education" appeared in the public's field of vision, the relevant education departments in Internet plus also paid great attention to personalized learning. Since each student has his own personal preferences in learning, the particularity of each student is worth considering. When the learning materials pushed to learners are aimed at each person's characteristics, students often have a better learning experience [1]. In recent years, with the rapid development of educational big data technology, educational researchers and educational technology companies in China have begun to pay attention to the research of personalized learning resources push.

1.2. Research value

Build cognition of learning process. It can help students sort out their learning objectives, master their learning progress, clarify their learning results, constantly review their own learning trajectory and performance, promote reflection and develop good learning habits.

Meet individualized learning needs. Students need to obtain learning resources according to their actual needs, so as to avoid being involved in the torrent of information, reduce the time of collecting, screening and sorting out information, and improve learning efficiency.

1.3. Purpose of the study

By collecting and analyzing the data in the learning process, this paper studies and discusses the effectiveness of personalized learning resource push in teaching.

1.4. Contents of the study

Collect learning process data, that is, collect learners' learning records in various learning systems [2], and take the course "Office Efficient Office" of Xi'an Eurasian University as an example to conduct an empirical study on personalized learning resource push. Among them, learning resources can meet various types of learning needs of learners, such as video and audio [3].

2. Research methods

2.1. Research objects and sample selection

In this study, two classes of Office Efficient Office course were selected as samples, and the experimental group applied the personalized learning resource push teaching method. Another class

ISSN 2522-6398 Vol. 7, Issue 10: 93-98, DOI: 10.25236/FER.2024.071015

served as a control group and was taught conventionally carry out teaching, and there is no personalized learning resource push in the learning process.

2.2. Data collection methods

Two methods were used for data collection of students in the experimental and control groups.

Learning process data collection: collect the usual scores, final exam scores, study time and other information of the experimental group and the control group for comparison.

Questionnaire method: Aiming at the students in the experimental group, a questionnaire on the teaching effect of pushing learning resources was conducted to understand their feelings and opinions on pushing learning resources.

2.3. Data processing method

We processed the data by SPSS, and used ANOVA and t-test to analyze the differences in academic performance and student feedback under two different teaching methods.

3. Data analysis and effect evaluation

3.1. Comparison of homework effects before and after "push" of learning resources

The course "Office Efficient Office" consists of four modules, with a total of 58 knowledge points, including 18 core and error-prone knowledge points. It pushes learning resources to the students in the experimental class, and analyzes the effect of completing homework before and after the push.

3.1.1. Module 1-Comparison of learning effects of "PhotoShop making magazine covers"

The students in the experimental group (40 students in total) finished the homework, and the teacher corrected it for the first time. As shown in Figure 1,5 students scored less than 60 points, 11 students scored 60-69 points, 11 students scored 70-79 points, 10 students scored 80-89 points, 3 students scored 80-89 points. Teachers pushed learning resources for students according to error-prone points. Students completed their study and revised their homework. After the second homework correction, 2 students scored less than 60 points, 16 students scored 70-79 points, and 12 students scored 90-100 points, indicating that the quality of students' homework completed after pushing has been significantly improved.

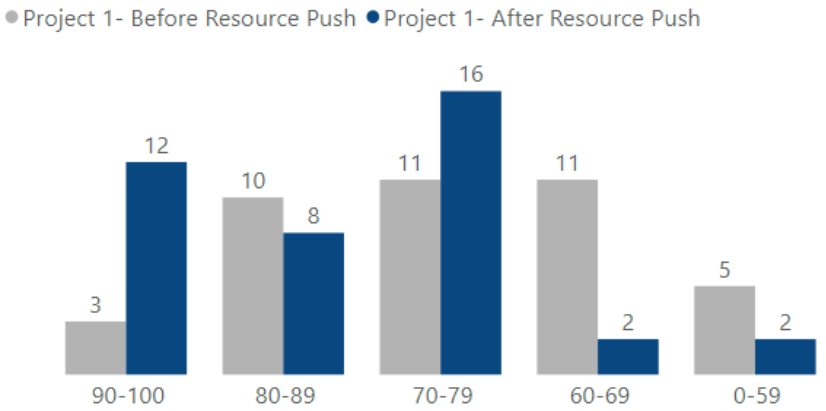

Figure 1: Analysis of the Learning Effect of Knowledge Point Resource Push for "PhotoShop Magazine Cover Production"

3.1.2. Module 2-Comparison of Learning Effects of "Word Document Layout"

The experimental group of students (a total of 40) completed the homework, the teacher's first correction. As shown in Figure 2, less than 60 points 4 students, 0 student scored 60-69 points, 3 students scored 70-79 points, 17 people scored 80-89 points, 16 people scored 90-100 points .Teachers pushed the learning resources for the students for the error-prone points, the students complete the study and revise the homework, after the second homework correction, the excellence rate increased

ISSN 2522-6398 Vol. 7, Issue 10: 93-98, DOI: 10.25236/FER.2024.071015

significantly.

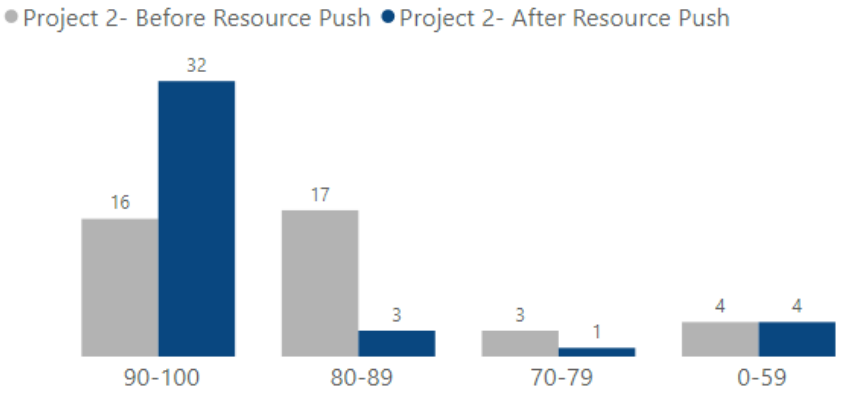

Figure 2: Analysis of the Learning Effect of Knowledge Point Resource Push for Word "Long Document Editing" and "Text Image Mixing"

3.1.3. Module 3-Comparison of Learning Effects of "Excel Data Processing"

The students in the experimental group (40 students in total) completed their homework, and the teacher completed the first correction. As shown in Figure 3, 14 students scored less than 60 points. 4 students scored 60-69 points, 4 students scored 70 points, 4 students scored 60-69 points, 15 students scored 70-79 points, 6 students scored 80-89 points and 1 student scored 90-100 points; the project is more difficult to assign, the knowledge points are more and more scattered, students are easy to forget, the teacher pushed the learning resources for students for the easy to error points, and students finished reviewing and revising their assignments. After the second correction, the number of failures decreased significantly, and the number of students scoring 70 points or more increased by a large margin, indicating that the quality of homework completed by students after the push was significantly improved.

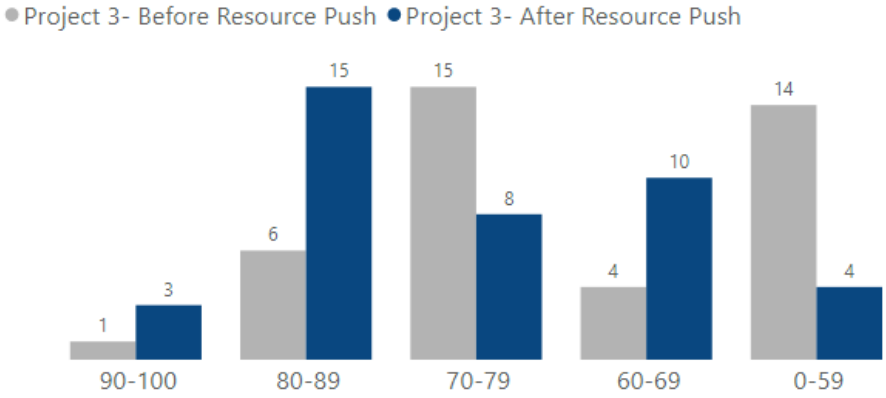

Figure 3: Analysis of the Learning Effect of Excel "Formula Functions" and "Data Management" Knowledge Point Resource Push

3.1.4. Module 4-Comparison of learning effects of "PPT typesetting design"

Students in the experimental group (40 in total) complete their assignments and the teacher completes the first correction. As shown in Figure 4,16 students score less than 60,2 students scored 60-69 points, 10 students scored 70-79 points, 12 students scored 80-89 points, and 0 student scored 90-100 points; the main problems are in the production of PPT mastering, text optimisation and presentation, and the overall scores of the assignments are on the low side; the teacher pushed the learning resources for the students to address the above error-prone points, and the students learnt on their own and revised their assignments; the number of students who failed was greatly reduced after the second assignment correction, and the number of students who scored 70 points or more increased significantly, and the number of students who scored 90 points or more increased significantly. After the second correction, the number of failures decreased significantly, the number of students with scores above 70 points increased significantly, and there were four students with scores above 90 points,

ISSN 2522-6398 Vol. 7, Issue 10: 93-98, DOI: 10.25236/FER.2024.071015

indicating that the quality of students' homework completion improved significantly after the push.

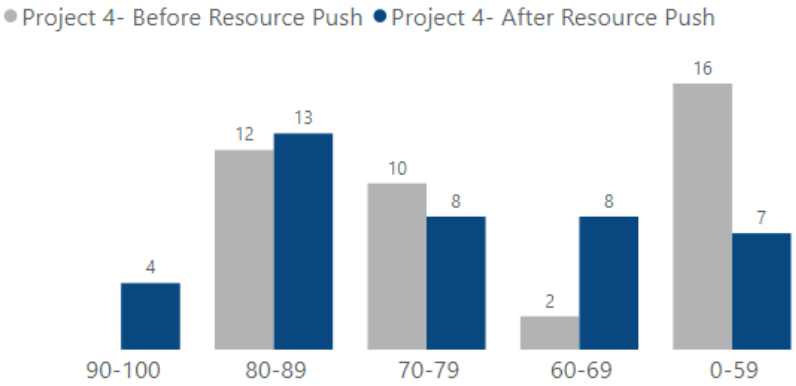

Figure 4: Analysis of the Learning Effect of PPT "Master Version Application" and "Layout Design" Knowledge Point Resource Push

3.2. Comparison of the total scores at the end of semester between the experimental group and the control group

After the final exam, we made statistics on the academic performance of the students in the experimental group and the control group. Through mean and standard deviation analysis, the total final score of the students in the experimental group was higher than that of the control group, as shown in Table 1.

Table 1: Comparison of Students' Final Grades

Variable name	Sample size	Average	Standard deviation
Experimental group	40	78.5	17.638
Control group	40	73.925	17.093
Experimental group paired control group	40	4.575	1.073

As shown in Table 2, the results of the paired sample T-test show that the significance P-value is 0.000 * * * and the Cohen's d-value of the magnitude of the difference is 4.266, indicating that the result is significant.

Table 2: Results of paired sample T-test

Paired variables	Mean ± SD			t	df	P	Cohen's d
	Pair 1	Pair 2	Pair Difference (Pair 1-Pair 2)				
Experimental group paired control group	78.5±17.638	73.925±17.093	4.575±0.545	26.978	39	0.000***	4.266
Note: * * *, * *, * represent significance levels of 1%, 5%, and 10%, respectively							

3.3. Resource Push Learning Style Satisfaction Survey

3.3.1. Questionnaire design

This study designed a student usage feedback questionnaire, including four modules: learning path, perceived usefulness, learning resources, and intention to use [4]. This questionnaire was designed in the form of a Likert 5-grade scale, and each item included 5 grades, indicating the respondent's degree of recognition of the problem, followed by "completely disagree" and "disagree", "General", "Agree" and "Fully agree", the specific test dimensions and topic settings in the questionnaire are shown in Table 3.

Table 3: Measurement Dimensions and Question Settings of Students' Use of the Questionnaire

Survey content	Measurement Dimension	Question Settings
Learning path	Adaptability	1. I think "personalized learning resources" are what I want to learn and can meet my learning needs.
	Content sequence	2. I will arrange my study in the order of "Personalized Learning Resources" content.

ISSN 2522-6398 Vol. 7, Issue 10: 93-98, DOI: 10.25236/FER.2024.071015

Perceived usefulness	Academic achievement	3. I think "personalized learning resources" can better help me improve my academic performance.
	Learning efficiency	4. I think "personalized learning resources" can better help me improve my learning efficiency.
	Learning interest	5. I think "personalized learning resources" have made me like information technology courses more and more.
	Learning confidence	6. I think "personalized learning resources" have enhanced my confidence in learning.
Learning Resources	Cognitive level matching degree	7. I think the learning resources pushed for "wrong questions" can help me realize my mistakes more clearly Wrong reason.
		8. I think the learning resources pushed for "wrong questions" can help me understand my learning more clearly Learn loopholes.
		9. I think the learning resources pushed for "Review of Important Knowledge Points" can help me review knowledge effectively Weak spots.
		10. I think the learning resources pushed for "pre-class preview" can effectively help me with pre-class preview.
		11. I think the learning resources pushed for "pre-class preview" can effectively help me understand the next class Important and difficult points.
		12. I think the learning resources pushed for "pre-class preview" can effectively improve my next class Don efficiency.
Intention to use	Willingness to learn	13. I am willing to use "personalized learning resources" to assist my learning.
	Willingness to share	14. I am willing to recommend "personalized learning resources" to other students.

3.3.2. Data collection

After two semesters of teaching, a questionnaire survey was carried out to 100 students in two grades, and the recovery was effective. There were 100 questionnaires. In order to ensure students' understanding of this questionnaire, before students fill it out, further explain some questions that are prone to misunderstanding, and try to ensure the validity of the data.

3.3.3. Reliability and validity analysis of questionnaire

In this study, the value of Cronbach's α was used to test the intrinsic reliability of the questionnaire. According to the relevant theory in statistics, when $0.35<\alpha<0.7$, it indicates that the measurement item has a certain degree of reliability; when $\alpha\geq0.7$, it indicates that the measurement item has good reliability.72 The value of Cronbach's α for the whole questionnaire is 0.966, and the α values for the four dimensions of the questionnaire - Learning Path, Perceived Usefulness, Learning Resources, and Intention to Use - are all above 0.7, indicating that this questionnaire has good reliability.

The results of KMO test showed that the value of KMO was 0.962, meanwhile, the results of Bartlett's Spherical test showed that the significance p-value was 0.000***, which presented significance at the level, and the factor analysis was valid to the extent of suitability.

3.3.4. Analysis of Survey Findings

(1) Learning path dimension

56% agree that the pushed learning resources meet the learning needs, and 58% agree that the pushed content is arranged.

(2) Perceived usefulness dimension

It is believed that pushing learning resources can improve learning efficiency, and this dimension agrees to account for 55%; It is believed that academic performance can be improved, and this dimension agrees to account for 61%; It is believed that it can improve learning interest and learning confidence, and 51% and 63% agree that this dimension accounts for 51% and 63%.

(3) Learning resource dimension

ISSN 2522-6398 Vol. 7, Issue 10: 93-98, DOI: 10.25236/FER.2024.071015

For the "wrong question" part, students generally think that this part can make themselves realize their learning loopholes, accounting for 64%; For the "review" part, students think that they can help themselves effectively review the weak points of knowledge, accounting for 66%; For the "pre-class preview" part, students think that it can make themselves understand the important and difficult points of the next class, accounting for 53%.

(4) Use intent dimension

Most students are willing to use the pushed personalized learning resources and actively recommend them to other learners, accounting for 59% and 64%.

4. Conclusions and deficiencies

The quality of homework completed by students in the experimental group after push was obviously improved; The average final total score of students in the experimental group was higher than that in the control group; Most students recognize the resource push teaching method. In short, the learning resource push teaching method can meet the learning needs of different students and improve the learning effect. However, it should be noted that the sample size of this experiment is very small. To a certain extent, the push content is designed from the traditional "exam-oriented education". The push is not accurate enough, and it is not really designed from the focus academic issues and hot academic issues that students care about. Therefore, Future push should also do enough articles on "precise push" [5].

Acknowledgements

Here, I sincerely express my gratitude to the 2022 Project Review Committee of Shaanxi Province's "14th Five Year Plan" Education Science Plan, and especially thank you for the project support and funding of the "Research on Personalized Learning Resource Push for Learning Process" project (project approval number: SGH22Y1801). The smooth progress and in-depth research of this project are not only thanks to the careful guidance and strong support of the Shaanxi Provincial Education Science Planning Office, but also to the full support and assistance of my unit, Xi'an Eurasia University. The college provides us with abundant academic resources and a favorable research environment, allowing us to focus on topic research, constantly explore and innovate. Here, we express our deepest gratitude to Xi'an Eurasia College and promise to continue working hard to repay the college's love and expectations with high-quality research results, and contribute our strength to the academic prosperity and educational development of the college. At the same time, we would like to express our sincere gratitude to the experts, scholars, and all participants who have provided us with assistance and support during the implementation of the project.

References

[1] Qu Zhixuan, Wang Pengjiao. Student personalized learning resource push based on learning analysis [J]. Software, 2019, 40 (12): 163-166.
[2] Mou Zhijia, Wu Fati. Research on personalized learning resource recommendation based on learner model in e-book bags [J]. Audio-visual Education Research, 2015, 36 (01): 69-76.
[3] Wang Chuanfang. Research on personalized push of online learning resources supported by learning analysis [J]. Information Technology and Informatization, 2019, (10): 163-164.
[4] Geng Nan. Research on personalized learning resource push based on student evaluation data analysis [D]. Jiangnan University, 2019.44-50.
[5] Liu Huarong, Hu Wenpeng. The influence of personalized push of learning resources on learning effect [J]. Journal of Taiyuan City Vocational and Technical College, 2019, (08): 151-152.