

Online Learning Preparation of College Students in Higher Vocational Education

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Abstract: Information technology has led to changes in traditional teaching concepts and approaches. In order to meet the new generation's pursuit of new learning forms, university teaching reform is imminent, and blended teaching, which combines the advantages of traditional teaching and online teaching, has undoubtedly become the first choice for university teaching reform in the era of technological innovation. In the face of rapid reform, how to cope with it is the primary issue for teachers and students in universities to consider. This study adopts research methods such as the questionnaire survey method and literature research method to investigate the readiness of teachers and students to promote blended teaching reform in a university in Shanxi Province. Firstly, the relevant literature of the last ten years was combed and analyzed to shed light on the research ideas of blended teaching readiness, and then it was decided to measure the readiness of teachers and students through questionnaires, teacher-student interviews, and classroom observations. In the early stages of the research practice, some teachers and students were interviewed to understand the educational background of the study participants, and a questionnaire was developed to investigate the readiness of teachers and students for blended teaching, which was divided into two parts: a teacher questionnaire and a student questionnaire. At the same time, we went into the teaching classroom to examine the real teaching situation in the field and record the real responses of teachers and students in the classroom. Next, the data obtained from the questionnaires, interviews, and observations were collected, collated, and analyzed in detail. Finally, the findings of this study are discussed in the context of the questionnaire, interview and observation results, and research implications are drawn. The study found that teachers were competent and relatively well prepared for the requirements of blended learning, but the actual implementation was less optimistic due to practical factors such as the difficulty of the subject, lack of time, and technical difficulties, and some teachers continued to teach using traditional lecture methods. Students generally lack self-awareness and have poor study management and self-discipline. First-year students were significantly more competent in all areas and more motivated to learn than students in other years. Reflections and analysis of the study findings yielded some insights: 1) explore appropriate teaching styles based on the nature of the subject; 2) concentrating on teachers' and students' lack of time; 3) providing technical assistance; and 4) determining appropriate teaching styles for students.

Keywords: Blended teaching preparation, teacher preparation, student preparation, university teaching reform, research study

1. Introduction

With the rapid development of Internet technology, people's lives and learning have undergone radical changes, especially in the field of education, where traditional education is facing great challenges. It can be said that information technology has changed the traditional teaching philosophy and methods. In the current context of "Internet + Education", blended teaching, flipped classrooms, and online learning have become new forms of teaching and learning (Pratama et al., 2020). Especially blended teaching has shown a spurt of development and has become the focus of attention of scholars from all walks of life again. Teaching reform in universities is becoming increasingly urgent to meet the new generation's pursuit of new forms of learning. Blended teaching has the advantages of both traditional and online teaching and is destined to become the first choice for teaching reform in universities when information technology is prevalent. Most universities in China are also experimenting with blended learning, but the

question arises as to whether teachers and students are adequately prepared to teach and learn in the face of the explosion of reform. We know that the readiness of teachers largely determines the effectiveness of blended learning, while the knowledge and skills that learners have in relation to the content before entering a new field determines the successful completion of their studies. Investigating the readiness of a 2013 class of distance learners at an open university along five dimensions, including learning attitudes, pointed out that early learning readiness has become an important influencing factor for academic success and provides support services for learners' academic success (Zhao et al., 2014). Dropout rates in online learning tend to occur early in the learning process, i.e., at the stage of readiness to learn. Learners cannot be judged as necessarily achieving well in a new field based on their existing performance. Therefore, in the context of blended learning reform in universities, there is a strong need to further explore the critical issue of blended learning readiness in order to ensure teaching effectiveness and to be able to make targeted and constructive recommendations.

From the learner's perspective, the overall readiness of higher education students to learn online during the epidemic was investigated, and the questionnaire data was analyzed to explore the key factors affecting the readiness of university students to learn online during this special period.

This study explores learners' readiness to learn online and provides a reference for the construction of a model of online learning effectiveness and satisfaction. In this study of readiness for large-scale online teaching and learning, the applicability of existing research findings related to online learning mechanisms during the epidemic in China is tested, and experience is accumulated and theoretical references are provided for the development of large-scale online learning applications in China.

2. Literature Review

Blended teaching reform in colleges and universities is the way forward for higher education in the information age and fits in with the talent development model of colleges and universities, and studying the readiness of blended teaching has become a condition to ensure the smooth implementation of teaching reform (Tu & Ibrahim, 2022). Based on previous research, teacher and student readiness is often a key influencing factor for a new teaching model, so it is essential to study blended teaching readiness in order to improve the effectiveness of reform in higher education. A review of relevant research in China and other countries reveals that most of the research on blended learning has been in the field of higher education. Research on blended learning in China has focused on constructing models, evaluating effectiveness, and influencing factors. The blended teaching model in higher education was constructed on the basis of foreign research and proved through practice that the model provided a modellable way to promote reform in higher education as a whole, enhancing the teaching skills of teachers as well as the initiative and motivation of students' learning in blended teaching (Ren et al., 2022). Yang and Sheikh Khairuddin (2022) performed an inductive analysis of the blended teaching model and concept in higher education institutions, providing experience for China's current vocational education reform. In addition to research on model construction, teachers' pre-course preparation largely determines the effectiveness of blended teaching, but teachers' attitudes towards blended teaching are more conservative and do not fully recognize the benefits of blended teaching (Xiaoying et al., 2018). In terms of both teacher attitudes and competencies, the requirements of blended teaching have been met, but are still influenced by practical factors, such as the nature of the subject, time issues, and technical difficulties (Xie & Tsai, 2021).

The supportive behavior of teachers in a blended learning environment has a significant impact on learners' cognitive engagement and motivation to learn (Wang et al., 2020). Factors that influence engagement in catechism learning include six dimensions: teacher support, teacher feedback, course content, course structure, perceived usefulness, and intrinsic motivation (Zhijia, 2017). The most representative of foreign theoretical models of blended teaching is the community of inquiry model proposed by researchers such as Garrison et al. (2001), who, based on constructivist theory, take social presence cognition, presence teaching, presence and emotional presence as elements of blended teaching. It is emphasized that teachers in blended learning should have specialized teaching methods and competencies (Korr et al., 2012). Teachers in blended learning should have conceptual qualities, adaptability, and technical skills (Powell et al., 2014). Lesson preparation, lesson design, communication and discussion, and motivation should be considered as teacher competencies for blended learning (King & Cerrone Arnold, 2012). Overall, the number of Chinese and foreign studies on the influencing factors of blended teaching is not particularly small, with some focusing on a holistic grasp and proposing relevant models; others focus on specific aspects such as teachers' conceptual qualities, curriculum design skills, teaching competencies, and information technology competencies.

Compared to research on teacher preparation, there is more research on students' readiness for independent learning in China, but research on students' competency readiness remains lacking. In one of these studies, students' readiness for learning was measured through questionnaires and interviews with specialist students at an open university. Appropriate suggestions for improvement were given regarding the problems reflected, and it was suggested that readiness for learning is key to the effectiveness of distance learning and should be given attention (Zhao et al., 2014). In a study of independent learning readiness among undergraduate nursing students from different universities, researchers found that nursing students' readiness for independent learning was at a moderately low level and also suggested ways to improve students' readiness by increasing satisfaction and stimulating interest in learning (Liao et al., 2017; Rahmani et al., 2017; Wang et al., 2015; Yang & Hospedales, 2014). Combining the characteristics of online

learning, the process of online learning for college students is divided into three stages: the online learning preparation stage, the online learning development stage, and the feedback and evaluation stage, and defines learning preparation as "the adaptation of the learner's original cognitive structure and mental state to the existing learning before learning" (Li, 2016). The introduction and popularization of the blended learning concept largely reflects the autonomy, creativity, and motivation of learners. He argues that readiness to learn includes familiarity with online learning platforms and their functions, as well as a feeling of the advantages of online learning. A study of adult online learning found that work experience and internal and external conditions related to the course studied have an impact on learners' learning outcomes, thus suggesting the development of targeted online learning resources based on learners' characteristics such as interests and personal traits (Li et al., 2021).

This suggests that blended learning learners should have a comprehensive and accurate understanding of their own characteristics in order to choose the right learning resources to enhance their learning outcomes. The study found that learners' learning activities were mostly focused on viewing learning resources and submitting course assignments, while participation rates in interactive categories such as forum discussions and learning assessments were low; learners were prone to burnout, their motivation gradually waned, and their sense of participation was not strong; learners were stuck in superficial learning, and it was difficult for deep learning to occur at the cognitive level, and they lacked critical thinking skills, thus suggesting that learners should develop skills in problem identification and self-reflection (Cobos & Ruiz-Garcia, 2021). It is evident that learners' readiness for self-directed learning is still lacking, while readiness for learning skills such as critical thinking is severely underprepared. Research based on self-determination theory concludes that the impact of external motivation on online learning engagement depends on the level of autonomy and that external motivation with high autonomy is positively facilitated by identity regulation and integration regulation. This research highlights the significant impact of autonomous learning readiness (Gao et al., 2016). The extent to which learners' internal drive machines in online learning influences cognitive-emotional engagement is greater than that of behavioral engagement (Yu, 2018). This enlightens us that learner preparation should focus on endogenous drive machine preparation.

There is a large body of research abroad on student readiness, which is defined as the attitudes, competencies, and personality traits that learners need to enter a new learning process. Various scholars have focused on readiness for self-directed and online learning, and all have used quantitative surveys to explore this. An analysis of the readiness of business students in the USA and Germany found no differences in willingness and motivation, but differences in readiness. In a study of adult learner readiness in Malaysia, it was noted that "cultural differences may have a greater impact on student readiness". This is consistent with the idea that there should be a human element in readiness to learn and that there should be a human element in readiness to learn. The analysis found that the factors that influence learning effectiveness include: interface characteristics, learning experiences, student roles and instructional tasks, and cognitive load (Vonderwell & Zachariah, 2005). Learners' perceived ability to learn online, the challenge of the content, the feedback received, interest in learning, and curiosity play an important role in motivating intrinsic learning. The perceived value of learning, learner autonomy, learning ability, and relevance of the content play a decisive role in the internal motivation of learners. Much attention has also been paid abroad to the evaluation of the effectiveness of blended teaching and learning in higher education, mainly in terms of learning achievement, satisfaction, and changes in teaching efficiency. In a study of a large number of blended learning lessons at the University of Granada, it was found that blended learning reduced student dropout rates, increased student achievement and satisfaction with learning, and had a significant effect when it came to increasing motivation to learn. In summary, research on teachers' and students' readiness for blended learning in China is relatively scarce, with most researchers focusing on students' readiness for self-directed learning, while other countries in particular have more mature research on readiness measurement tools. Based on this, it is hoped that the research on Chinese students' readiness for blended learning will build on the research in other countries.

3. Methodology

This study uses a quantitative research approach to understand learners' readiness for online learning and to analyze the factors that influence learners' readiness for online learning by administering questionnaires to participants in online learning at Zhumadian Vocational and Technical College. Firstly, a literature review was conducted on the topic of online learning readiness and its influencing factors to identify the factors that may affect learners' online learning readiness from existing studies and to understand the current state of research. Then, based on the previous work, the variables to be measured were selected, the questionnaire was integrated, and then the developed questionnaire was tested for reliability and validity. The questionnaire data included demographic variables such as gender, age and ethnicity of the learners, as well as the finalized online learning readiness factor variables, which were then distributed and collected. Once the questionnaires were collected, the data were analyzed using SPSS statistical software to explore the relationships between the variables.

4. Results

4.1 Research Tools

The student questionnaire was developed under the guidance of Dr. Lai Chee Sern and Dr. Lai Chee Sern and was finalized after continuous refinement. The student questionnaire contains two parts: the first part is the basic information about the students (gender, age, and ethnicity); and the second part is the main content of the questionnaire, which contains three main components: knowledge, attitude, and skills. Knowledge is the student's knowledge base of their blended learning; attitude refers mainly to the student's motivation to learn; and skills are a measure of the learning abilities needed for the student to undertake blended learning. The distribution of the various questions in the questionnaire is shown in the Table 1.

Table 1: The distribution of the various questions in the questionnaire

Part	Serial number	Question
Part 1: Basic information	1	What is your gender?
	2	What is your age?
	3	What is your ethnicity?
	4	Are you an only child
Part 2: Knowledge of online learning	1	I know the basic knowledge of computers
	2	I know how to keep a good sitting posture when studying online
	3	I know I need to adjust my eyesight after watching the computer for a long time
	4	I know about Wi-fi network
	5	I know how to share the screen with others
Part 3: Attitude towards online learning	1	I know how to adjust the brightness of computer screen
	2	I know how to use online classroom or online chat tools to communicate with teachers
	3	I know how to connect Wi-fi to my mobile phone or computer
	4	I know how to make courseware
	5	I know how to adjust the clarity of the camera
Part 4: Attitude towards online learning	1	I will finish my homework on time and send it to the teacher in time
	2	I like to preview before online class
	3	I like to communicate with teachers online
	4	I like live online teaching because it is more convenient
	5	If I don't understand this lesson, I will watch the live playback until I understand it
	6	I will enter the online class in advance to prepare

The Cronbach's alpha value, reflecting the reliability of the instrument, was determined through a reliability analysis. The reliability analysis involved three constructs, namely the feasibility of knowledge (0.877), the feasibility of skills (0.705) and the feasibility of attitudes (0.730), with an overall alpha value of 0.871. The reliability coefficients were all above 0.7, indicating that the questionnaire items could be used for data collection.

4.2 Results Analysis

The questionnaires were distributed to students at Zhumadian Vocational and Technical College and were randomly distributed by the researcher in the cafeteria, library, and study rooms on campus. Each participant was asked and confirmed to have participated in two (2) semesters of online teaching before distribution to ensure the authenticity of the results. The questionnaires took about 15 minutes to complete and were collected immediately after completion. A total of 120 questionnaires were distributed and 108 questionnaires were collected, with a return rate of 90.00%. Among them, 102 questionnaires were valid and 6 were invalid, with a validity rate of 94.44%. The validity of the questionnaire was 94.44%. The next step of the study can be carried out after the reliability test. The means of the three dimensions of knowledge, skills, and attitudes were tested and were all normally distributed; outliers were tested and found to exist for mean B (knowledge), mean C (skills), and mean D (attitudes). The analysis of the questionnaire data enabled the measurement of students' readiness for online teaching and learning and the analysis of differences in students' readiness in various areas. In addition, the data related to the questionnaire can also provide a degree of effort and targeted suggestions for teaching reform in universities. Table 2 shows student gender distribution.

Table 2: Student gender distribution

	Frequency	Percentage	Valid percentage
Male	59	57.8	57.8
Female	43	42.2	42.2
Total	102	100	100

When the sample was analyzed, it was clear that male students were over-represented in terms of gender, as shown in the Table 2. The researchers also found a clear gender difference during the survey, which is in line with the reality that there are more male students than female students in vocational and technical institutions. The mean and variance statistics were first performed for each dimension: measurements were obtained as in Table 3.

Table 3: The mean and variance statistics were first performed for each dimension

		Statistics		
		Knowledge	Skills	Attitude
N	Valid	102	102	102
	Missing	0	0	0
Mean		3.9275	4.2020	4.1765
Median		4.2000	4.2000	4.1667
Std. Deviation		.61775	.36206	.38739

Separate statistics for each are tabulated in Table 4.

Table 4: Separate statistics for each

Part	Questions	N		Mean	Median	Std. deviation
		Valid	Missing			
Knowledge	I know the basic knowledge of computers	102	0	3.89	4.00	0.911
	I know how to keep a good sitting posture when studying online	102	0	3.95	4.00	0.776
	I know I need to adjust my eyesight after watching the computer for a long time	102	0	3.88	4.00	0.787
	I know about Wi-fi network	102	0	3.90	4.00	0.764
	I know how to share the screen with others	102	0	4.01	4.00	0.738
	I know how to adjust the brightness of computer screen	102	0	4.07	4.00	0.748
Skills	I know how to use online classroom or online chat tools to communicate with teachers	102	0	4.42	4.00	0.553
	I know how to connect Wi-fi to my mobile phone or computer	102	0	4.15	4.00	0.534
	I know how to make courseware	102	0	4.22	4.00	0.538
	I know how to adjust the clarity of the camera	102	0	4.16	4.00	0.558
Attitude	I will finish my homework on time and send it to the teacher in time	102	0	4.10	4.00	0.622
	I like to preview before online class	102	0	4.18	4.00	0.587
	I like to communicate with teachers online	102	0	4.11	4.00	0.612
	I like live online teaching because it is more convenient	102	0	4.21	4.00	0.551
	If I don't understand this lesson, I will watch the live playback until I understand it	102	0	4.32	4.00	0.647
	I will enter the online class in advance to prepare	102	0	4.15	4.00	0.604

Statistical results showed that students' knowledge base for online learning ($M = 3.92$, $SD = 0.62$) was lower than their skills ($M = 4.20$, $SD = 0.36$) and attitudes ($M = 4.18$, $SD = 0.39$), while there was little difference between skills and attitudes. The highest score for the knowledge dimension was 4.01, indicating that the students knew how to focus on the computer and considered it to be very helpful for their learning, which to some extent enhanced their learning.

However, their score of 3.89 for 'Know the basics of computers' indicates a lack of knowledge of computer basics. It is clear that students' scores for topics T1, T2, T3, and T4 were all below the expected level of readiness (4), suggesting that students' poor knowledge of readiness may affect their completion of the learning tasks when studying online. Students scored above the expected level of readiness (4) on all other topics, but none of them reached the critical point of 4.2, indicating that students were generally prepared in these specific areas, but there were still areas that needed to be improved, and the areas covered in the topics were likely to be entry points to help students improve their readiness.

The highest score for the skills dimension was 4.22, indicating that students thought that "learning to create courseware" was very helpful to their learning and would improve their learning to a certain extent, but their score for "how to adjust the brightness of the computer" was only 4.07. However, their score for "how to adjust the brightness of the computer" was only 4.07, indicating that students did not place much emphasis on the hands-on aspect of the subject, and their low score for their hands-on skills indicates that they are aware of their own lack of skills. It is clear that students scored above the expected level of readiness (4) on all topics, which shows that students have good online skills that may help them in their learning tasks during blended learning. The students were largely prepared in these specific areas, but there are still some areas for improvement.

Students scored above 4.1 on the attitude dimension, indicating that they were "generally prepared, but need some improvement" on this dimension. The highest score for T15 was 4.32, indicating that students were eager to 'learn something new' and found watching the live replay very useful for their learning, and that teachers could optimize the content of the replay in the future according to students' specific circumstances. The high scores for each topic show that students are generally well prepared in these specific areas, but there is still room for improvement.

5. Discussion

The aim of this study is to investigate the online learning readiness of university students participating in online learning at Zhumadian Vocational and Technical College during the New Crown Pneumonia epidemic; to investigate three aspects of university students' knowledge, skills, and attitudes towards online learning, to form an overall evaluation of online learning readiness; and to explore its influencing factors, so as to provide a basis or suggestions for the construction of university online courses with the following specific conclusions and discussions.

5.1 Overall Readiness for Online Learning is Adequate

The study found that, overall, the online learning student readiness of students at Zhumadian Vocational and Technical College was relatively adequate and the level of suitability development was good. From the existing research literature, no researcher has yet conducted a study on the relationship between online learning readiness and online learning suitability among university students. However, it is worth noting that research on the relationship between secondary school students' learning readiness for online learning and learning engagement has shown a significant positive effect of learning readiness on learning engagement production in secondary school students' online learning (Aijing, 2020). Therefore, in conjunction with the findings of this study, it can be found that the impact of online learning readiness is significant.

5.2 Students' Knowledge Base for Online Learning is Slightly Inadequate

According to the analysis of the results, although the questionnaire measured those students were ready for online learning, their knowledge was below their skills and attitudes. Each learner has a different level of knowledge, and each learner has a different level of awareness of the meaning of learning itself. If students feel that the learning activity, they are engaged in has value to them, or can quickly see this value, etc., this will influence their judgement and inclination to actively engage in learning. Therefore, the value of online learning should be valued and the advantages of the openness of access to resources, the freedom of communication, and the flexibility of learning plans in online learning spaces should be demonstrated to online learners so that students can become the leaders of their own online learning (Ren et al., 2022).

5.3 Students are Well Stocked with Skills for Online Learning

According to the analysis of the results, although the majority of university students have the skills to learn online, there are still some outstanding problems such as too many learning platforms, no fixed learning platform in schools, cumbersome cross-platform operations, and the need for students to master the skills to operate each platform software. Many researchers believe that a number of objective disadvantages may negatively affect students' transition to online learning, emotional balance, online learning engagement, satisfaction, online work skills proficiency, motivation, and self-directed learning aspects (Choi & Chiu, 2021; Czerniewicz et al., 2020; Graham & Pasi, 2020; Yeh et al., 2019; Hung et al., 2010).

5.4 Students Show Good Attitudes Towards Online Learning

Based on the analysis of the results, it can be seen that university students have a good attitude towards online learning

and have developed a good psychological readiness to learn online. This result confirms that the group of university students, who are learners and users of online learning technologies represented by Internet technologies, have a strong openness and inclusiveness towards online learning methods (Choi & Chiu, 2021). Among other things, learners' propensity for sustained engagement in learning activities is higher than their current level of awareness and learning experience, and students are willing to engage in online learning activities, but there is still room for further improvement in terms of recognition of the value of the advantages of online learning and positive and enjoyable learning experiences.

Therefore, the pure online learning attitudes of university students during the New Coronary Pneumonia epidemic give some guarantee to the feasibility of carrying out blended learning combining online and offline in future higher education teaching, while theoretical and practical research on blended learning should be carried out to pay attention to students' online learning attitudes so as to stabilize or improve their positive attitudes and ensure the effectiveness of learning. In addition, the opposing performance of gender-specific learners in terms of learning experience and sustained engagement is indicative of the influence of learners' own attributes on their attitudes towards online learning and the need to take into account learners' personality traits and developmental characteristics in order to provide training and training related to online learning (Hung et al., 2010).

6. Conclusion

Finally, there are two main limitations of this study: firstly, the sample was unevenly distributed, the number of schools involved was not extensive and the level of schools was not comprehensive; secondly, the scale was not sufficiently structured and there were not enough questions on the dimensions that could characterize readiness for online learning, which affected the reliability and validity of the overall scale. Therefore, in future research, we can take online learners of specific courses as the research objects and build a scale of online learning readiness and its influencing factors so as to improve the structure of the questionnaire and provide a reference solution for improving college students' understanding and experience of online learning and enhance their adaptation to online learning.

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