

# AN INTEGRATIVE REVIEW ON READINESS FOR BLENDED LEARNING IN CHINA'S HIGHER VOCATIONAL COLLEGES

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**Abstract** – Blended Learning (BL) has been taken as one of the major trends in technology enabled learning around the world. It has become a necessity in China in the past three years when this country tried hard to fight with COVID-19, and at the same reduced the negative effects of the pandemic on its educational system. Meanwhile, effective implementation of BL called for readiness of its three stakeholders, namely, institutions, teachers, and students. This need was especially urgent in China's Higher Vocational Education (HVE) as it has historically received less attention in talent cultivation quality improvement. Contrasting to the less attention China's HVE received, its importance in China's economic and social development has increased greatly in the past two decades. To provide some insights to the BL readiness research in the context of China's HVE, this study applied an integrative approach to review related literature on BL readiness in China's HVE from two Chinese databases, which mainly focused on the research ranging from 2014-2023. Applying conceptual thinking, this review showed that there was limited research on BL readiness in research on BL in China; for the collected seven paper, this study reached conclusions on the major perspectives and major variables explored, it also presented the overall status quo of the existing BL readiness research in China's higher vocational education. Apart from that, implications for future studies were provided based on findings of this study.

**Keywords** – BL, readiness, China's HVE

## I. INTRODUCTION

China's higher vocational education boosted in the 1990s due to the industrial needs of workforce with higher vocational skills to contribute to the economic and social development of China. After decades of development, now, China has the largest vocational education system in the world. However, the fast expansion in scale inevitably resulted in the decrease of talent cultivation quality in those institutions (Shi, 2013; Li et al., 2011; Stewart, 2015).

Digital technology has great potential in enabling teaching and learning, technology enabled learning (TEL) has now become an integral part of higher education around the world. As one of the major trends of TEL, BL has been encouraged in China's higher vocational education to improve its quality in teaching and learning (Henderson et al., 2017; Lytras et al., 2020).

However, the readiness of stakeholders of BL is a challenge for the effective application of BL, BL

implementation in China's higher vocational colleges is no exception to this challenge (Mirriahi et al., 2015). What's worse, China's higher vocational colleges have lagged behind compared with academic universities as historically expenditures on China's higher vocational colleges have been substantially lower than that on research-oriented universities (Stewart, 2015). In 2020, the outbreak of COVID-19, however, put these two types of higher education at the same start line to apply BL to maintain teaching order and quality with significantly different infrastructure conditions, students' learning foundation, and teaching staff preparation (Jiang, 2022; Li, 2020).

Under this background, this study tended to review related literature on BL readiness in China's higher vocational colleges to provide a better understanding of BL implementation in those institutions.

## II. RESEARCH QUESTION

To contribute some insights to the research and practice of BL in China's higher vocational colleges, this review tends to review literature related to BL readiness in China's higher vocational colleges. The research questions are as follow:

1. What are the position of research on BL readiness in research on BL in China?
2. What are the features of the existing research on BL readiness in China's higher vocational colleges?
3. What are the implications for future studies based on this review?

## III. METHODOLOGY

The literature review of this study was based on an integrative approach. This approach is suitable when the aim of the review is to "assess, critique, and synthesize" related literature to produce new theoretical frameworks or perspectives (Torraco, 2005; Snyder, 2019, p. 335). Meanwhile, Conceptual thinking (MacInnis, 2011) was applied to do the analysis in this process.

Blended Learning/Teaching readiness, China's higher vocational education/colleges were used as key terms to collect data from CNKI (China National Knowledge Infrastructure), and NCPSSD (National Center for Philosophy and Social Science Documentation).

The search conditions were set as: articles, including journal articles, conference articles, masters' thesis, doctoral dissertations, documents from official websites ranging from 2014 to 2023. Steps to narrow down the range of collected literature included: firstly,

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select and exclude unrelated or loosely related literature based on the title, keywords, and abstract of those papers, which resulted in 144 documents. Secondly, based on fast scanning of the content of those documents, 44 articles were closely related to BL readiness in China's higher education, among them, only 7 of them were especially targeting BL readiness in the context of China's higher vocational colleges, the rest were based on situation in research-oriented universities or with no mentioning of its orientation but only specify that it focused on higher education in China. In the end, this literature review included the 7 files in the final analysis phase. The rest thus have been excluded from the data analysis archive. As in the data collecting process, not all major databases were explored and only article titles, abstracts, and keywords, were scanned to detect related literature, the researcher did not claim that an exhaustive list was obtained.

To be clear, the definitions of key terms in this paper were defined as follows:

**BL.** Though there are various of forms of definitions revolving around BL, a common theme of BL definition in higher education can be found, which can be represented by the definition given by Bliuc et al. (2007, p. 233), this researcher defined BL as "the mix of traditional methods of teaching, such as face-to-face teaching and online teaching". This way of defining BL has been approved by many researchers (Dziuban et al., 2006; Wong et al., 2014; Owston et al., 2013).

**BL Readiness.** Wong et al. (2014) identified three kinds of readiness: institution readiness, staff readiness, and student readiness. This comes from the framework developed by Machado (2007) to measure e-readiness in higher education institutions (HI).

Institutional readiness was defined as the access to technologies, infrastructure, and policies in a BL environment. faculty and student readiness refer to the state of these two groups being prepared to apply BL under institutions' support. Teacher readiness is defined as demanded skill set and mindset for developing and performing BL courses. It has a direct impact on their ability to select pedagogical options to design and teach BL courses. Student readiness refers to their preparedness to learn in BL environment provided by institutions and teachers (Burgess et al., 2016; Burgess et al., 2018). In this study, BL readiness is defined as preparedness of the three major stakeholders to effectively implement BL. (Blayone, 2018; Gunawardena & Duphorne, 2001; Schrum & Hong, 2002; Wong et al., 2014).

**Higher vocational colleges.** In this study, higher vocational colleges refer to vocational technical colleges or polytechnic colleges provide two- or three-year diploma courses in China (Stewart, 2015, p. 16)

#### IV. FINDINGS

##### Position of research on BL readiness VS research on BL

### 1. Significant change of research on BL in China

The research on BL in China started in 2004 when Professor Zhu Zhiting of East China Normal University first introduced blended learning in 2003 in his book *Mixed Learning in Distance Education* published with China Distance Education. The first journal article on BL was contributed by He Kekang, a Professor of School of Educational Technology, Beijing Normal University. His paper focused on Blending Learning from the angle of Educational Technology Theory which was published in China Educational Technology. In fact, he has discussed e-learning as early as 1990s.

The research on BL has received limited but steady attention from 2004 to 2014, then in 2018 and 2019, the number of papers on BL increased significantly, in 2021, the number tripled, and in 2023, the number already quadrupled even if the analysis data collected only stop in May, 2023, as showed in Figure 1.

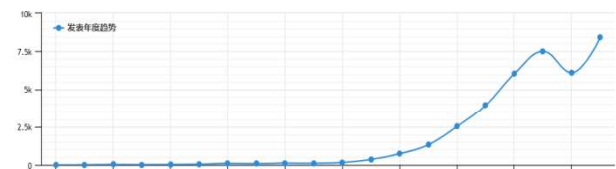


Figure 1 The volume of papers published on BL from CNKI (2004-2023)

From CNKI visualized analysis.(2023).  
<https://webvpn.sdu.edu.cn/https://77726476706e69737468656265737421fbf952d2243e635930068cb8/kns8/Visual/Center>

### 2. Limited research on BL readiness

Among the large amount of research on BL, only a small portion was related to BL in China's higher education (11.83%) and China's higher vocational education (5.22%), as showed in Figure 2.

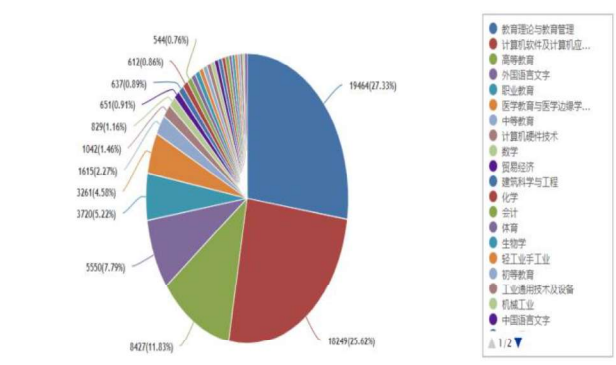


Figure 2: Portions of different focus in BL research (CNKI: 2004-2023)

From CNKI visualized analysis.(2023).  
<https://webvpn.sdu.edu.cn/https://77726476706e69737468656265737421fbf952d2243e635930068cb8/kns8/Visual/Center>

The limited research on BL in higher education and higher vocational education mainly lay in the following aspects (Ashraf et al., 2022; Chen & Ma, 2019; Guo, 2021; Han & Wang, 2021; Li Q.P. et al., Liang, 2019; Ma, 2019; 2022; Yang, 2021; Xiao et al., 2019; Wang, 2019; Zhang C. et al., 2022):

- (1) The feasibility of BL
- (2) Teaching effects of BL
- (3) Various modes of BL
- (4) Teaching design of BL
- (5) Problems and challenges of BL

Few studies on BL in these two contexts focused on BL readiness, altogether 44 papers were found closely related to BL readiness in such contexts, among which only 7 articles explored BL readiness in higher vocational colleges.

For the 7 papers on BL readiness in the context of China's higher vocational colleges, two were written before the outbreak of COVID-19, the rest were written after the pandemic. The details of the seven paper under analysis are as follows:

**TABLE 1: THE LIST OF ARTICLES ANALYZED**

NO.	Author (year)	Title
1	Zhang et al. (2021)	Investigation and Research on the Satisfaction of Online and Offline Hybrid Teaching and Learning Effects under Abnormal Conditions—Taking Jiangsu Agriculture and Forestry Vocational and Technical College as an Example
2	Li et al. (2021)	Research on Improving the Self-efficacy of Higher Vocational Students by Blended Teaching
3	He (2019)	Investigation and analysis of vocational students' preparation for blended learning
4	Wang (2017)	Research on the Acceptance of Blended Learning by Teachers in Higher Vocational Colleges.
5	Liu (2021)	Investigation and Countermeasure Research on the Current Situation of Mixed Teaching Ability of Higher Vocational Teachers.
6	Liao et al. (2020)	A Study on the Acceptance of College Students to Blended Teaching—Based on the Comparison of DTPB and TAM Models.
7	Li (2021)	Investigation and Analysis of BYOD-Based Blended Teaching Status—Taking Zhejiang Textile and Garment Vocational and Technical College as an Example

### Major research subjects

The framework of Wong et al. (2014) were widely acknowledged in research area, they identified three kinds of readiness: institution readiness, staff readiness, and student readiness. Many Chinese researchers followed this framework in explore BL. It is no wonder BL readiness research also investigated from those perspectives.

### 1. Institutions' perspective

Only one of the seven papers drew its attention to institutional readiness. Through a questionnaire survey, Li J. X.(2021) explored blended teaching with BYOD(Bring Your Own Device), she focused on teacher and school readiness, teachers' and students' expectations on teaching and learning effects, and disadvantages of BL. It concluded that BYOD-based blended teaching was well prepared and carried out smoothly. Benefits were remarkable, and the advantages of BL implementation outweighed the disadvantages.

### 2. Teachers' perspective

Two researchers explored teachers' readiness for blended learning. Wang (2017) explored teachers' readiness for BL in five higher vocational colleges in Anhui Province with a survey questionnaire that covered teachers of different majors, ages and professional titles. A total of 100 questionnaires were distributed and 97 were returned, with a return rate of 97%. apart from that, in-depth interviews were conducted with 5 teachers from different disciplines and majors in these 5 colleges were performed. This article used quantitative and qualitative methods to analyze and discuss the acceptance of BL of teachers in higher vocational colleges in China.

Liu (2021) did not specify the specific college(s) he included in his data collection, generally, he described that the respondents of the survey are the teachers of higher vocational colleges. There were no constraints on the demographic features of the participants. The research team used QQ group and WeChat to disseminate the electronic version of the questionnaire online. A total of 145 questionnaires were recovered and 136 valid questionnaires were determined.

Through the questionnaire survey method, the current situation of mixed teaching ability of higher vocational teachers was investigated and researched. The research results showed that teachers recognized the teaching concept of online and offline integration, and were willing to practice and carry out BL, but they felt that they lacked corresponding capacities required by BL in terms of BL-related data analysis, BL design, BL-related theoretical knowledge, and the ability to maintain continuous improvement and innovation. The article proposed to enhance the ability of higher vocational teachers in BL implementation by strengthening the training of in-service teachers' information literacy, especially data literacy, formulating reasonable supporting policies and evaluation mechanisms, and motivating teachers themselves; at the same time, teachers need to constantly practice Exploring and innovating a flexible hybrid teaching that integrates online and offline.

### 3. Students' perspective

Compared with the number of BL readiness research from teacher and institution perspectives, there are more research focused on student readiness for BL. Zhang et al. (2021) took Jiangsu Agriculture and Forestry Vocational and Technical College as the research context, they explored the basic situation of the BL implementation in this higher vocational college. Students' perceptions of BL were collected and analyzed to provide some understanding on the advantages and disadvantages of the blending offline and online teaching, and to provide reference opinions for how to effectively use the online and offline hybrid teaching mode in college teaching.

Li X.R, Gong L., and Wang L. (2021) collected survey data from 2,684 students of four schools of Dali Agriculture and Forestry Vocational and Technical College. The research showed that self-efficacy in the field of education is related to academic performance. Performance is related, improving students' self-efficacy can improve students' academic performance and produce a virtuous circle. They also concluded that the



implementation of blended teaching has significantly improved students' sense of self-efficacy, and the effect of teaching, and thus played a positive role in promoting talent cultivation in higher vocational colleges.

He (2019) randomly selected 18 classes of students from the 2018 students of a higher vocational college as the object of this questionnaire survey. A total of 871 questionnaires were received, all of which were valid questionnaires. The content of the questionnaire survey includes students' hardware preparation, information technology ability and application, independent learning ability and blended learning tendency. The survey results showed that students' hardware devices can support online learning; higher vocational students were familiar with the application of information technology in daily life, but few students applied information technology in learning; higher vocational students' independent learning ability was not strong, most students held neutral attitude toward blended learning. Therefore, before implementing blended teaching, teachers need to provide certain guidance to students to better prepare students for the use of information technology and enhance their confidence in blended learning. In the process of implementing BL, teachers should play a leading and supervisory role, and students should gradually improve their ability of independent learning so as to give full play to the advantages of blended learning.

Based on comparison between DTPB (Decomposed Theory of Planned Behavior and TAM (Technology Acceptance Model), Liao M.H., Liao M.Z., and GU T.H. (2020) explored students' acceptance and influencing factors for BL. Their study took sample from both vocational colleges in Guangdong Province and research-oriented universities in Jiangxi Province, because research that are solely devoted to BL readiness in China's higher vocational colleges are so limited that this research which considered both types of higher education was also taken into analysis. The research of Liao et al. (2020) focused the factors that affect students' acceptance of blended learning. 320 questionnaires were collected and 298 valid questionnaires are accepted in final analysis. Using SPSS18.0 to compare and verify behavior intentions based on DTPB or TAM models, the result showed that the students' behavior intentions at blended learning was affected by resource facility, compatibility, subjective norms and perceived usefulness.

### **Major variables explored**

Though there were only limited number of literatures on BL readiness in China's higher vocational colleges, there still emerged some commonly mentioned variables. Considering the number of the existing literature, all variables mentioned were classified and counted to avoid missing of any important information.

#### **1. Most mentioned variables**

Knowledge on BL, Attitude toward BL, and Infrastructure for BL implementation are variables mostly mentioned in BL readiness research no matter their focus is on teachers, students, or institutions. Variable "Knowledge on BL" was mentioned by Li et al. (2021); Wang (2017), Liu (2021), and Liao et al. (2020) in their

research. Variable "Attitude toward BL" was mentioned by Li et al. (2021), Wang (2017), Liu (2021), and Liao et al. (2020), and Li (2021). Variable "Infrastructure conditions" was mentioned by Zhang et al. (2021).

#### **2. Second most mentioned variables**

At least three researcher commonly mentioned variables like Emotional responses, Institutional policy and support, and technical capacity. Variable "Emotional responses" appeared in the research of Zhang et al. (2021), Wang (2017), and Liu (2021). Variable "Institutional policy and support" appeared in the research of Wang (2017), Liao et al. (2020), and Li (2021). Variable "Technical capacity" appeared in the research of Zhang et al. (2021), He (2019), and Li (2021).

#### **3. Less mentioned variables**

Some Variables were only investigated in one or two research papers, this does not reduce its importance in BL readiness exploration considering the limited number of existing literatures on BL readiness. Another potential reason may lie in the fact that BL readiness research focus on different perspectives as mentioned in Major research subjects in this paper, research focusing on teachers' readiness for BL may put students' self-regulation and ability to study independently aside. In the same way, research focusing on students' readiness for BL may put teachers' ability to implement BL in a less important position while considering the major affecting factors for BL readiness. So, variables like "Students' self-taught ability" (mentioned by He, 2019), Teachers' implementing ability" (mentioned by Liu, 2021), and "Motivation" (mentioned by He, 2019; Wang, 2017) were still worth researchers' attention.

### **Status quo of BL readiness in practice**

All seven research papers examined the current state of BL readiness in China's higher vocational colleges from the perspectives of three stakeholders: institutions, teachers, and students, their main conclusions include the following points.

#### **1. Institution readiness**

In terms of institution readiness, the studies found that while schools have provided some infrastructure and support for BL implementation, there is still room for improvement. For example, the network speed and coverage were not up to standard, and relevant policies and technical training were needed to support the implementation of BL. Zhang et al. (2021) concluded from their survey data that the school has provided online teaching for 96.68% of its students. Though 65.26% of the respondents of the survey questionnaire complained of congestion of the internet while having online class.

The research data analysis of Li et al. (2021) showed that 78.99% of 871 participating students indicated that they could use the school's WiFi for free, but 54.55% of them are not satisfied with the school's network speed. The importance of the resources and facilities provided by the school for BL readiness was tested in the research of Liao et al.

Wang's (2017) research also pointed out that the network was not up to the standard (14.4%), and full campus network coverage has not been achieved, which may affect students' use of the network to receive online teaching. Apart from hardware and software conditions, his research also investigated training and policy support, and believed there should be improvement in those aspects. Those views are similar to the conclusions of Li (2021). The results of her research showed that the school's hardware equipment can support blended teaching, and the school's networks can support blended instruction, but there should be applied some relevant policies and technical training to support the implementation of BL.

## **2. Teacher readiness**

Two collected papers on teacher readiness for BL concluded that teachers have realized the importance of BL and has accepted the fact that BL should be implemented in higher vocational colleges, but they were not adequately confident in their ability to design, implement, and manage BL, and were in need of more policy and training support.

In Wang's (2017) research, there four types of forces to push teachers to realize the necessity of implementing BL. Firstly, 31.9% of the survey participants thought the current educational environment, i.e. educational informatization has played a role in pushing them to implement blended learning. Many teachers have realized that if they do not follow the trend of informatization, they may suffer the fate of being eliminated, which prompts them to implement blended learning. Secondly, the present teacher-led and student-centered teaching environment also made teachers realized the importance to implement BL. The third force is the need to improve the teaching effect (18.6%) and the learning needs of students (19.6%). Lastly, the requirements of the school authorities on teachers (16.5%) also increased the number of teachers implementing BL.

Liu's research (2021) concluded that 94% of survey participants has accepted BL and were willing to carry out this teaching mode, more than 80% of those higher vocational teachers have comparatively advanced teaching concepts, 62% of these teachers believed that it was not difficult to implement BL. However, higher vocational teachers need to improve the following abilities: theoretical knowledge on BL, Teaching design of BL, including BL management, pedagogical strategies, data analysis, and operational skills, continuous improvement, and innovation capabilities in BL implementation.

The rest five papers focused on institution and students' readiness, but also mentioned the necessity of preparing of teachers to facilitate the readiness of schools and students.

## **3. Student readiness**

The collected literature on BL student readiness has agreed that students in China's higher vocational colleges thought that BL was an acceptable teaching mode for them. Meanwhile, that research also stress that students in vocational colleges are more dependent on school and teacher guidance in BL, and need to enhance their ability

in self-regulated learning and independent learning. In terms of the skills to use BL-related devices and applications, different results were found.

In terms of BL-related technological skills, He (2019) did research and showed the technological skills of higher vocational college students were at the upper-middle level, and they were good at using BL-related applications. Whereas, Zhang et al. (2021) found that 35.05% of their research subjects were unable to use the online resources proficiently.

In terms of BL-required self-regulated learning and independent learning. He (2019) introduced the situation: students tend to use computers/mobile phones to play games, or chatting, rather than to use them for learning. She also pointed out that higher vocational college students were weak in autonomous learning, and they lack the ability to independently formulate study plans, implement those plans, and adjust the plan according to the actual situation and arrange the time reasonably. Similarly, Liao et al. (2020) specially emphasized the importance of providing abundant and interesting learning resources to students, and offering necessary support to guide students to change their learning attitudes, improve their independent learning and promote their awareness in collaborative inquiry in BL.

## **Suggestions for future research on BL readiness**

The seven articles that are closely related to BL readiness in China's higher vocational colleges share some similarities but also differ in other aspects. This section will summarize the areas that future research can contribute to.

For one, all papers focused on one perspective of BL readiness in terms of BL stakeholders. None of the them took a holistic look at the three stakeholders of BL. Only the research of Li (2021) included institution and teacher readiness in her research, the rest six papers solely investigated teachers' or students' perspective. Research on BL readiness considering more than one stakeholder was suggested.

For another, there are limited research in BL readiness in China's higher education, and research in the context of China's higher vocational colleges are even less. What's more, the existing BL readiness research in China's higher vocational colleges took place in very limited number of cities which were mostly located in east and middle-east of China. BL readiness research that are done in higher vocational colleges in different districts of China is required to provide a better understanding of the situation of BL readiness in China's vocational colleges.

Still another, most research did not explore the influence of the research participants' demographic features on BL readiness. Only one of the seven research, the study of Li et al. (2021) explored the effect of gender on BL readiness in terms of self-efficiency. Other research, though collected some data on participants' age, teaching years, academic title, or academic degree, did not compare research subjects' BL readiness in terms of these features. Future studies may take a look of potential demographic features of the research participants that may affect BL readiness.

Finally, six research applied quantitative survey to collect data on BL readiness, with only one researcher Wang (2017), applied both quantitative questionnaire and qualitative interview. Future study may include more research methods in BL readiness research.

## V. CONCLUSION

Blended learning has been encouraged in China's higher vocational colleges to improve its quality in talent cultivation. The effective implementation of BL required readiness of the three stakeholders of BL. However, though the volume of research on BL has significantly increased in the past decade, the portion of BL readiness research in China's higher vocational colleges only took a very small portion. Though there was very limited number of research that especially focused BL readiness in China's higher vocational colleges, the analysis of the carefully selected seven articles still shed some light on the current situation of BL readiness research in those contexts.

The findings showed that BL readiness research mainly explored from the perspectives of the three stakeholders of BL separately; variables mentioned with highest frequency included: Knowledge on BL, Attitude toward BL, Infrastructure for BL implementation, variables like Emotional responses, Institutional policy and support, and Technical capacity were also often explored. In terms of the status quo of BL readiness, students can accept BL, but their short-link in self-regulated learning and independent learning. Teachers have realized the importance of BL but may need enhancement in abilities to implement BL. Institutions have provided some infrastructure conditions for BL implementation, but supporting policies and training support may require further improvement.

Apart from that, implications for future studies were provided, future studies are suggested to explore BL readiness from a holistic perspective, considering more potential affecting demographic factors, in more vocational colleges in different areas of China, and with multiple research methods applied.

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