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The Acceptance Behavior of Blended Learning in Secondary Vocational School Students: Based on the Modified UTAUT Model

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Abstract: With the COVID-19 pandemic, the importance of online learning for students and teachers in schools across the country has become more crucial than ever. Blended learning, combining online and offline learning, has gradually developed into a new normal mode in primary and secondary schools. However, the factors influencing the acceptance behavior of secondary vocational school students have been inadequately investigated and have failed to address if secondary vocational students are willing to accept this learning model. This study aimed to analyze the influential factors and measure the behavioral acceptance of blended learning. This study adopted the modified model of the unified theory of acceptance use of technology (UTAUT) to understand the behavioral acceptance of blended learning from secondary vocational school students. Multiple-item scales were established, based on validated previous measurement scales and adjusted following the characteristics of secondary vocational school students. Data from 240 valid samples were analyzed statistically, applying the partial least square structural equation modelling. The results indicated that the acceptance intention was positively influenced by students' perceptions of social influence, facilitating conditions, perceived joyfulness, self-learning management and self-efficacy. Meanwhile, performance expectancy and effort expectation were insignificant. Personal characteristics, such as gender, grade, voluntariness and experience, insignificantly adjusted the influence of all factors on the acceptance of blended learning. The conclusion of this study can provide some theoretical support and practical guidance for the improvement of blended learning quality in secondary vocational schools. The results indicated that students' perceptions of SI, FC, PJ, SM, and SE could positively anticipate the UA to accept blended learning, having a relatively strong influence from SE and PJ.

Keywords: secondary vocational students; blended learning; acceptance; unified theory of acceptance and use of technology (UTAUT)

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1. Introduction

With the gradual development and deepening of education information, information technology has promoted the continuous reform and innovation of education and learning methods [1]. As a new learning model, blended learning has been favored because it effectively could combine the advantages of online and offline learning. It has become the focus and research object of learning researchers and has been gradually applied in various learning fields [2]. In January 2017, the 13th Five-Year Plan for the Development of National Education issued by The State Council pointed out: "Teachers should be encouraged to use information technology to improve the learning level, innovate the learning modes, use flipped classrooms, blended learning and other ways to form a new model of online and offline ubiquitous learning" [3,4]. All of these indicate that blended learning has become an important direction and trend of learning development, in the information age.

With the support of the relevant policies of the national government, most secondary vocational schools have already had a good information-based learning environment and gradually began to adopt the blended learning mode. The blended learning mode in secondary vocational schools is the concrete practice of the application of how to use, how to adapt to, how to attain the appropriate level, and how to meet the students' satisfaction. Therefore, scholars have gradually turned to hybrid secondary vocational school learning, but at present, the attention of blended learning for secondary vocational schools, is mostly focused on blended learning design, learning effect, and technology applications, while there are few studies on the intention of using blended learning [5].

Whether blended learning can improve the learning quality in secondary vocational schools, students' acceptance and behavior intention are important factors affecting the effect of blended learning [6]. Only when students accept this learning mode psychologically and are willing to continue to use it in the future learning process, can it give full play to its advantages and promote students' learning. Therefore, it is very important to study the influencing factors of secondary vocational students' acceptance of blended learning, which will be a key step for secondary vocational schools to popularize and apply blended learning and will also affect its future development trends.

2. Literature Review

2.1. Keywords on Blended Learning

High-quality research results were obtained by searching the core collection of the Web of Science (WOS) database. With "blended learning" or "hybrid learning" as the subject keyword search, the search deadline was August 2021 and the retrieved items were 27,692. Through a longitudinal comparison of years, the amount of literature keeps increasing every year, among which the number of researchers in this field was highest in 2020, reaching 4815. The retrieval items were refined and excluded. The WOS type was "educational research" and the literature category was "conference papers and journal papers". Finally, 4882 items were left. VOS viewer was used to extract the word frequency from the literature and the results are shown in Figure 1.

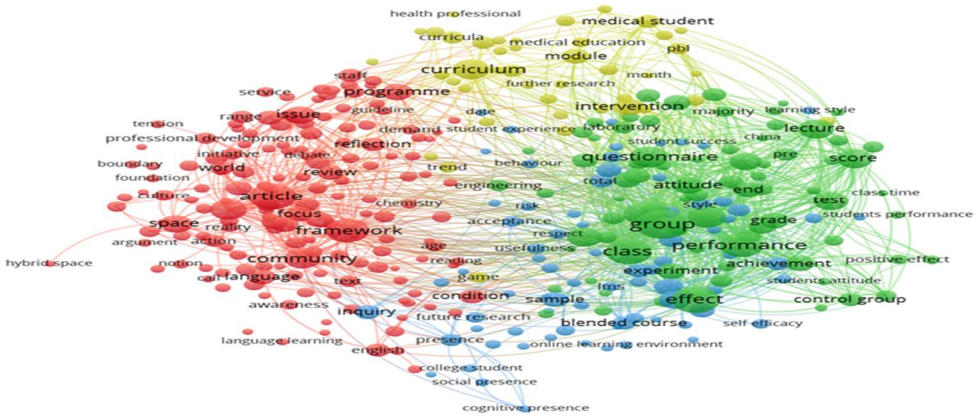

Figure 1. High-frequency keywords.

The 362 keywords form four clusters, roughly divided into four parts. The first part is the green area, with "group", "performance", "effect", and "attitude" as the central words. The second part concerning the students' performance, satisfaction, and control groups is the red area, that is centered on "space", "perspective", "community", etc. It is a combination of a hybrid space, with reflection and teacher education. The third part is the yellow area. It centers on "curriculum", "medical education", and other related words, "curricula," and "medical students". In the blue area, the online learning environment was centered on "blended course"," blended learning environment", and "online discussion".

2.2. Research on Blended Learning

In the core database of the Web of Science, 903 articles were searched by using "student" as the title keyword and "technology acceptance" as the theme keyword and the latest results were published in August 2021. Then, "student" and "technology acceptance" were used as the keywords for the accuracy retrieval and a total of 93 pieces of literature were found, that dated from 2002 to 2021. In the case of precision retrieval, "blended learning" and "technology acceptance" were taken as the title keywords and the retrieval results were published in 2013, 2016 and 2017. The foreign literature review found that most of them were related to the influencing factors of blended learning satisfaction or acceptance. This paper believes that both satisfaction and acceptance belong to the prediction of behavioral intention. Therefore, this paper summarizes the influencing factors of satisfaction and acceptance as follows:

Based on the social cognition theory, Wu et al. explored the determinants of students' learning satisfaction in a mixed environment, in which computer self-efficacy, system function, content characteristics, and interaction greatly influenced students' learning expectations. The learning atmosphere and achievement expectation significantly affected learning satisfaction, especially the interactive learning atmosphere [7]. Al-azawei et al. explored the influence of learners' learning styles on the behavioral intention of blended learning and combined the perceived satisfaction with technology acceptance (TAM), according to psychological characteristics and learners' beliefs. The results show that the correlation between the learning style's perceived usefulness, perceived satisfaction, and technology acceptance is weak, but the understanding ability in learning style has a significant impact on satisfaction [8,9].

Padilla et al. focused on perceived playfulness in blended learning environments and revealed the existing gender differences. It shows that among women, playfulness directly influences attitudes toward technology acceptance. In men, this effect is mediated by the perceived usefulness [10]. Khechine et al. believed that the UTAUT model had strong explanatory and predictive abilities and mainly discussed the moderating effects of gender and age on the four variables of performance expectancy, effort expectation, social influence and facilitating conditions. The research showed that only the age variable had a moderating effect [11]. Abbas et al. used the Moodle online platform to explore the influencing factors of student satisfaction in Iraqi students' courses of academic English writing and blended learning. Teacher-student interaction and curriculum influence are the greatest, regardless of the students' background [12].

So, and Brush pointed out that explicit learning guidance, learning activities, face-to-face support, and collaboration ability are all important factors affecting students' satisfaction with blended learning [13]. Diep et al. investigated the blended learning system more comprehensively and constructed a model of student satisfaction in the blended learning environment. In these models, teachers' professional skills, support, students' perceived task value, achievement target expectation, self-efficacy, learning environment, and interaction are all key factors affecting students' satisfaction [14]. However, they still have different views on the impact of technology on student satisfaction in blended learning. For example, Henrie et al. found in their study that media technology had no direct impact on students' satisfaction [15]. According to the study of Kintu et al., technology and online tools are key influencing factors of student satisfaction [16].

In related research on blended learning, research achievements at home and abroad include the following aspects: First, research on basic blended learning theories. The second is the design and application of the blended learning mode. The third is the resource construction and platform design of blended learning. Fourth, blended learning practice research. Theoretical aspects focus on the definition, theoretical basis, learning mode, and resource construction of blended learning. In practice, it mainly focuses on implementing the learning mode and process in specific learning. The research on learning participation and acceptance focuses more on the relationship between satisfaction and learning effectiveness.

From the perspective of the research content in China and other countries, it pays attention to the macroscopic theoretical exploration. It lacks the microscopic empirical research, and there are few studies on the acceptance of students in blended learning. The learning acceptance of blended learning is also based on the study of the acceptance of unilateral online learning (E-learning) [17]. Studies on the influencing factors of learning acceptance are relatively scattered and are limited to the simple linear correlation between several factors and learning acceptance without a more systematic and in-depth study of the complex relationship between factors [18].

In terms of the research object, the object of study mainly focuses on adult education students, undergraduates, vocational students, and ordinary high school student. Few will learn time, relatively free, and self-discipline is not strong among secondary vocational students, and some research is confined to a subject or a particular course, which makes the study sample size limited [19]. there is a big difference in the way of learning and the learning content between secondary vocational students and ordinary high school students. So, are secondary vocational students willing to accept this kind of learning method? Further research is needed on factors affecting students' acceptance of blended learning. There is still insufficient research on the acceptance of blended learning in secondary vocational schools, so it is necessary to study the acceptance of it in secondary vocational schools and its influencing factors. Therefore, Practical research on improving the acceptance of blended learning for secondary vocational students is chosen as the research topic to explore the status quo, the influencing factors, and the practical application of blended learning for secondary vocational students, to provide a relevant reference for the better application of mixed learning in secondary vocational learning, in the future.

3. Theoretical Framework and Research Hypotheses

3.1. Theoretical Framework

Most researchers have conducted many studies on technology acceptance in different industries, the improved relevant models, proposed other potential variables that restrict the acceptance, and evolved the theoretical models suitable for different research contents. For example, the composite TAM and TPB model (TAM-TPB), the PC utilization model (MPCU), the technical task adaptation model (TTF), the social cognition theory (SCT) and the motivation model (MM) have a high degree of strong interpretation in specific industries. Venkatesh et al. summarized and integrated the potential variables involved in the above theoretical model, into four dimensions in 2003, and developed the integrated theory of technology acceptance and use (UTAUT) [20]. Figure 1 shows that the UTAUT model contains not only two outcome variables (voluntariness to use and behavior) but also four core variables (effort expectation (EE), performance expectancy (PE), social influence (SI), and facilitating conditions (FCs), as well as four moderating variables (voluntariness, age, gender, and experience), as shown in Figure 2.

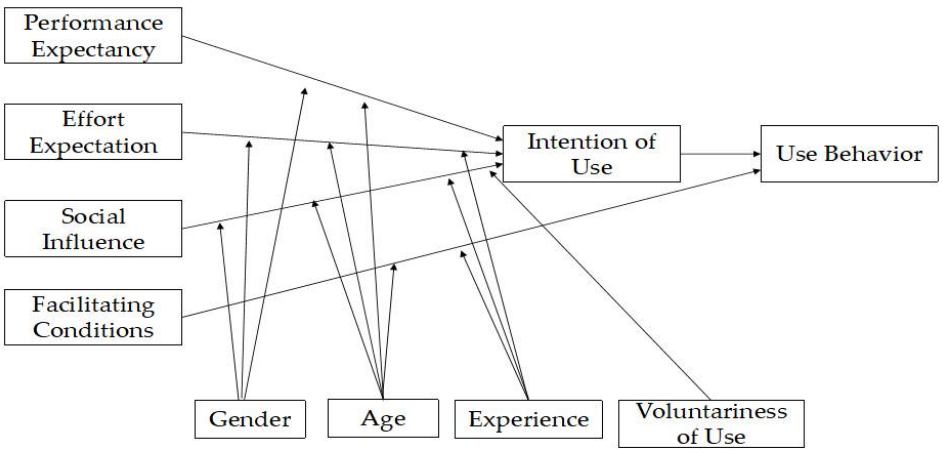

Figure 2. UTAUT Model.

The theoretical model mainly contains the following three values: Firstly, it studies, based on the existing theoretical model and develops PE, EE, SI, and FCs, which are four elements affecting the individual technology acceptance and explains their kernel in detail. Secondly, it introduces moderating variables, which not only make the model have a stronger explanatory degree and a wider universality, but also makes the technical, theoretical model more perfect. Thirdly, the UTAUT model plays a unique advantage in the research of user technology acceptance because of its strong explanatory degree. However, the UTAUT model, as a general-use technology use model, also makes it difficult to avoid some defects. Venkatesh et al. emphasized that the measurement of the UTAUT model is still preliminary and the content validity needs to be further improved when discussing the limitations of the UTAUT model [18]. The relevant variables contained in other theoretical models may not be fully reflected in the UTAUT theoretical model.

As mentioned above, the UTAUT model has a good diagnostic value and strong explanatory power in the study of technology acceptance. However, the original UTAUT model may not be able to fully meet the interpretation of special technology or situational changes, due to different research object groups.

Therefore, the UTAUT model has been adjusted appropriately, according to the interviews and surveys of teachers and students in secondary vocational schools. The model was modified and integrated by adding and deleting some variables, to enhance its applicability and explanatory power.

3.2. Hypotheses

Based on the UTAUT model as a theoretical reference, combined with existing research conclusions, blended learning and characteristics of secondary vocational students, this paper adds new research variables and constructs a hypothesis model of acceptance of blended learning (from now on referred to as the "hypothesis model"), as shown in Figure 3. The hypothesis model contains the following research hypothesis:

Hypothesis 1 (H1). *Performance expectancy (PE) will have a significant positive influence on the acceptance of blended learning.*

Hypothesis 2 (H2). *Effort expectation (EE) will have a significant positive influence on the acceptance of blended learning.*

Hypothesis 3 (H3). *Social influence (SI) will have a significant positive influence on the acceptance of blended learning.*

Hypothesis 4 (H4). *Facilitating conditions (FCs) will have a significant positive influence on the acceptance of blended learning.*

Hypothesis 5 (H5). *Perceived joyfulness (PJ) will have a significant positive influence on the acceptance of blended learning.*

Hypothesis 6 (H6). *Self-learning management (SM) will have a significant positive influence on the acceptance of blended learning.*

Hypothesis 7 (H7). *Self-efficacy (SE) will have a significant positive influence on the acceptance of blended learning.*

Hypothesis 8a (H8a). *Gender will moderate the influence of PE, EE, SI, FCs, PJ, SM, SE on the acceptance of blended learning.*

Hypothesis 8b (H8b). *Grade will moderate the influence of PE, EE, SI, FCs, PJ, SM, SE on the acceptance of blended learning.*

Hypothesis 8c (H8c). *Voluntariness of use will moderate the influence of PE, EE, SI, FCs, PJ, SM, SE on the acceptance of blended learning.*

Hypothesis 8d (H8d). *Experience will moderate the influence of PE, EE, SI, FCs, PJ, SM, SE on the acceptance of blended learning.*

In many mature acceptability models, "user acceptability" (UA) reflects the psychological cognition of acceptability in terms of the behavioral intention, that is, an individual's voluntariness and subconscious plan to engage in a certain behavior, which can be used as an indicator to predict behavior. Some studies believe that acceptance includes individual user behavior and individual attitude towards objects, so the voluntariness and use behavior of the original model is collectively referred to as acceptance [21]. Acceptance in this paper refers to secondary vocational students' heartfelt acceptance of the blended learning mode after experiencing it and their voluntariness to continue to use it in future classes, including their intention to use the blended learning and their behavior of using it. More details in Figure 3.

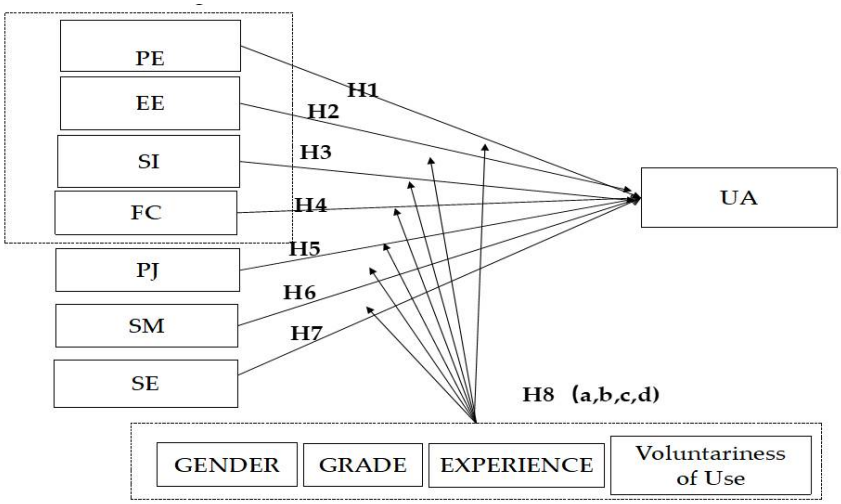

Figure 3. Hypothesis model.

4. Materials and Methods

4.1. Measurements

All the items were measured with a 5-point Likert scale (1, strongly disagree; 3, indecisive; 5, strongly agree) More details in the Appendix A. All of the test items were modified, based on the relevant literature and combined with blended learning characteristics, to ensure a more reliable and effective questionnaire. A total of 30 questions were designed and 40 secondary vocational students were recruited to complete the initial questionnaire. A reliability and validity analysis were used to test the recovered data, to delete the unqualified heading items with a load factor less than 0.5, and to sort out the remaining 25 questions to form the final questionnaire.

Part 1. Performance Expectancy

In the UTAUT model, performance expectancy refers to the individuals' belief that using the system will improve work efficiency, academic performance, etc. This paper uses performance expectancy to describe secondary vocational students' perception of their academic performance and learning value in the blended learning process. The variable has three items:(1) I find blended learning beneficial for my studies. (2) Blended learning helps me to finish my study task more quickly. (3) If the teachers use blended learning, my academic performance will improve.

Part 2. Effort Expectancy

Effort expectancy refers to how easy an individual thinks it is to use a system. In this paper, effort expectancy is used to describe secondary vocational students' perception of the difficulty of using the learning platform in the process of blended learning. The variable

has three items: (1) It is easy for me to carry out the study skillfully in mixed-class learning. (2) I find it very easy to learn after using blended learning. (3) The knowledge taught in blended instruction is clear and easy to understand.

Part 3. Social Influence

Social influence refers to the degree to which individuals perceive that the people around them influence them. Social influence is used to describe the attitude of secondary vocational students to blended learning from those who are important to them (such as teachers, classmates, etc.). The variable has two items:(1) Generally speaking, the school advocates and supports the teachers to carry out blended learning. (2) The people who matter to me think I should accept blended learning.

Part 4. Facilitating Conditions

Facilitating conditions refer to the degree to which individuals feel the support of the objective conditions for their behaviors when using the system. In this paper, a facilitating condition describes the degree of support of the relevant technology and the equipment to the system experienced by secondary vocational students in the blended learning process. The variable has two items: (1) There are specific people (or teams) who can help with the difficulties of implementing blended learning, such as a broken tablet, an unlogged platform, and so on. (2) Hybrid learning and traditional learning complement each other.

Part 5. Perceived Joyfulness

Davis et al. believe that perceived joyfulness means that users pay attention to the pleasure obtained by using the system, the value of the system itself and the perceived pleasure in using the system [22]. Other studies have confirmed that the positive emotions of users in the technology acceptance model significantly impact the decision support system [23]. A survey shows that secondary vocational students generally lack motivation for learning and interest is the biggest motivation for learning. Secondary vocational students in the process of blended learning perceived the stronger the pleasure, the more they can improve their learning interest, enhance their learning motivation and accept blended learning more easily. This variable has four items:(1) I think blended learning can help me to improve my creativity. (2) I think blended learning is fun. (3) Blended learning makes me feel very happy when I study. (4) I think blended learning can improve my imagination by getting information.

Part 6. Self-learning management

Self-learning management is a process in which learners consciously make plans, constantly take measures to evaluate, control and adjust them, and finally complete the predetermined goals and tasks. This variable has three items:(1) I can effectively manage my study time and finish my homework on time. (2) I can learn on my own. (3) I am very disciplined in my studies and it is easy to set aside time for reading and homework.

Part 7. Self-efficacy

Self-efficacy is the confidence and belief that an individual can accomplish a certain task or goal through his skills. Poor and weak learning foundations are the consistent evaluation of secondary vocational students. However, they are more pragmatic, willing to explore and practice and willing to work hard to achieve a certain goal. The higher the students' self-efficacy, the more positive their attitude to information technology, highlighting the higher level of information literacy [24,25]. This variable has three items:(1) In the blended learning process, I have more opportunities to interact with my teachers. (2) In the process of blended learning, I can communicate with other students. (3) I find help when I encounter difficulties or problems in the blended learning process.

Part 8. User Acceptability

User acceptability indicates the level of acceptability of a certain thing and reflects the level of cognitive attitude towards a certain thing. Some studies also believe acceptance

includes the individual's use behavior and attitude toward the object, so the voluntariness to use and the use behavior is collectively referred to as acceptance [24]. Acceptance in this paper refers to the acceptance of the blended learning model by secondary vocational students after experiencing it and they are willing to continue to use the learning model in the future classroom, including both the intention of secondary vocational students to use blended learning and the use behavior of secondary vocational students to blended learning. This variable has five items: (1) I would like to continue to use blended learning. (2) I will continue to accept blended learning in future classes. (3) I like blended learning. (4) I recommend blended learning to my classmates, friends, or peers. (5) I hope there will be more opportunities to learn or acquire knowledge through blended learning.

4.2. Data and Sample

This paper investigates the secondary vocational students who have used blended learning in three secondary vocational schools in Zhejiang Province of China. The learning platforms adopted by the three schools are the Super Star Learning Pass, Blue Moyun Class, iSmart-Student, Class Optimization Master, UMU interactive platform, Wisdom vocational Education, etc. To ensure the quality of the collected data, the headteacher of each class explained the purpose and matters of the survey before filling in the questionnaire, to eliminate some psychological prejudices of the students. The questionnaires were collected between 10 December 2020 and 30 January 2021 and were distributed on-site and through the Internet. A total of 275 copies were distributed and 271 copies were recovered, with a recovery rate of 98.5%. Following the collection of the questionnaires, the valid questionnaires were screened out through certain criteria. The inspection criteria are mainly as follows: incomplete questionnaire filling, incomplete answer phenomenon, consider the volume of 26 questions as invalid. If all of the answers are consistent, the questionnaire is considered invalid. If the answer time is less than 2 min, it will be invalid. If any of the above situations occur in the recovered questionnaire, the questionnaire will be judged invalid and removed. According to this test standard, 31 invalid questionnaires were eliminated, leaving 240 questionnaires with an effective recovery of 87.3%. Some researchers have pointed out that when the number of measurement variables of the potential variables is four at most, the survey's sample size is at least over 65 [26]. This study's maximum measurement data of the latent variables is four and the effective sample is 240, which meets the requirements.

5. Results

5.1. Descriptive Statistics

In this paper, SPSS 23.0 was used to analyze 240 valid data. The statistics showed 106 male students (44.2%) and 134 female students (55.8%). With 116 (48.3%) in grade one, 100 (41.7%) in grade two, and 24 (10%) in grade three; 114 students (about 47.5%) were under the conditions of mandatory use, 126 students (about 52.5%) were under the conditions of voluntary use; 127 (52.9%) had a rich experience, and 113 (47.1%) had a limited experience. As can be seen from Table 1, the score of each variable is between 2.43 and 5.56, and the standard deviation is less than 1.53, indicating that the score of each variable presents a relatively narrow distribution around the mean.

Table 1. The results of the descriptive statistical analysis of each variable.

Variable	PE	EE	SI	FCs	PJ	SM	SE	UA
mean	3.52	3.50	3.26	3.68	3.50	3.40	3.52	3.57
SD	0.67	0.61	0.60	0.57	0.61	0.63	0.59	0.66

5.2. Measurement Model Evaluation

Cronbach's α and the constructed reliability (CR) are used to test the reliability of the measurement model. As for the judgment standard of Cronbach's α, it has been mentioned

above: $\alpha > 0.5$ is an acceptable range, and $\alpha > 0.7$ is of a considerable reliability [27]. Constructed reliability (CR) is mainly used to evaluate the internal consistency among the observed variables belonging to a latent variable. A high construction reliability means a high correlation between the observed indicators; that is, the internal consistency of the observation indicators is strong. Otherwise, it indicates inconsistency. The analysis of the construction reliability in this study follows the judgment criteria adopted in most studies: if the construction reliability is less than 0.5, the reliability is unacceptable. If the construction reliability is greater than 0.8, it indicates that the reliability is very good.

Cronbach's α and CR values of the measurement model are shown in Table 2. Cronbach's α of most variables is greater than 0.7 and Cronbach's α of a few variables is second only to 0.7 and greater than 0.5, which are all within the acceptable range. From the perspective of the construction reliability, the CR values of the 14 variables in the measurement model are all significantly greater than 0.8, indicating that the reliability is very good. In summary, the measurement model in this study has good reliability.

Table 2. Analysis of the reliability and validity of the measurement model.

Latent Variable	Observed Variable	Mean	SD	CA	CR	AVE
UA	UA1	3.625	0.723	0.917	0.938	0.753
	UA2	3.583	0.729			
	UA3	3.533	0.766			
	UA4	3.475	0.756			
	UA5	3.642	3.642			
EE	EE1	3.467	0.798	0.794	0.877	0.705
	EE2	3.317	0.830			
	EE3	3.500	0.710			
FCs	FC1	3.533	0.818	0.667	0.852	0.743
	FC2	3.583	0.729			
PE	PE1	3.558	0.828	0.830	0.898	0.746
	PE2	3.542	0.721			
	PE3	3.458	0.787			
PJ	PJ1	3.467	0.798	0.848	0.897	0.686
	PJ2	3.442	0.848			
	PJ3	3.408	0.739			
	PJ4	3.533	0.709			
SE	SE1	3.492	0.745	0.868	0.919	0.791
	SE2	3.592	0.750			
	SE3	3.525	0.777			
SI	SI1	3.592	0.704	0.586	0.828	0.707
	SI2	3.300	0.740			
SM	SM1	3.608	0.802	0.782	0.872	0.694
	SM2	3.375	0.810			
	SM3	3.300	0.805			

The validity test of the measurement model was analyzed from two perspectives: aggregation validity and discriminant validity. The aggregation validity reflects the degree of correlation between the variable measures, mainly measured by the average variance extracted (AVE) and the factor load. Generally speaking, when AVE is greater than 0.5,

the aggregation validity of the model is good. The factor load refers to the correlation coefficient between the observed variable and its corresponding latent variable. Since the minimum acceptable value of the load is 0.5, it indicates that the measured item has a good reliability and the quality of the questionnaire is good.

As shown in Table 2, the factor loads of all measures reach the threshold standard greater than 0.5. In addition, the AVE values of all measures are greater than 0.5, indicating that the model has a good aggregation validity. In summary, the measurement model in this study has a good aggregation validity.

The following two criteria evaluate the discriminative validity: First, the method of comparing the square root of AVE and the correlation coefficient between the variables can be used for the evaluation. Fornell et al. proposed that when the AVE square root of a variable is greater than the correlation coefficient between the variable and all other variables, the discriminant validity of the measurement tool is good [28]. Second, referring to Chin et al.'s research, this study uses the cross-loading method to evaluate the discriminant validity of the variables. This paper adopts the first method to test [29].

As can be seen from Table 3, the AVE square root of each variable is significantly greater than the correlation coefficient between this variable and all other variables, indicating that this research model has a good discriminative validity. The above analysis shows that the measurement model has a good reliability and validity. Next, the structural model is tested.

Table 3. Test results of the measurement models.

	Aggregation Validity	**Discriminant Validity**							
	AVE	EE	FC	PE	PJ	SE	SI	SM	UA
EE	0.705	1	-	-	-	-	-	-	-
FCs	0.743	*0.681*	1	-	-	-	-	-	-
PE	0.746	*0.817*	*0.699*	1	-	-	-	-	-
PJ	0.686	*0.825*	*0.749*	*0.825*	1	-	-	-	-
SE	0.791	*0.631*	*0.771*	*0.730*	*0.723*	1	-	-	-
SI	0.707	*0.659*	*0.691*	*0.726*	*0.747*	*0.786*	1	-	-
SM	0.694	*0.699*	*0.605*	*0.724*	*0.675*	*0.680*	*0.680*	1	-
UA	0.753	*0.711*	*0.803*	*0.743*	*0.822*	*0.860*	*0.818*	*0.724*	1

Note: The data in italics on the lower triangle are Pearson's correlation coefficients.

5.3. Structural Model Evaluation

The interpretation of the structural model test indicators is commonly used: (R^2) coefficient of determination, utility value (effect size, f^2), prediction correlation (predictive relevance, Q^2), and adapter (goodness of fit, GoF) [29]. It is generally believed that when R^2 is greater than 0.67, the structural model has a strong explanatory ability. When R^2 is around 0.33, it has a moderate explanatory ability. When R^2 is around 0.19, the explanatory ability is weak. It is that f^2 indicates the influence of potential exogenous variables on endogenous potential variables. When f^2 is greater than 0.35, it indicates that the potential exogenous variables greatly influence the endogenous potential variables. When the f^2 value is about 0.15, it has a moderate influence; when the f^2 value is about 0.02, it has little influence. Q^2 represents the prediction correlation of the structural model. When Q^2 is greater than 0, it indicates that the structural model has a prediction correlation and the larger the Q^2 value is, the stronger the prediction correlation is. The GoF represents the fitting degree of the structural model. When the GoF is greater than 0.36, it indicates that the structural model has good goodness of fit; when the GoF is about 0.25, it indicates that the fitting degree is medium; when the GoF is about 0.1, it indicates that the fitting degree is low [27]. It can be seen in Table 4. R^2 is equal to 0.856, indicating that the structural model has a strong explanatory ability. The utility value f^2 is greater than 0.02 except the EE variable. Q^2 was higher than 0.24 and the correlation of the prediction was strong. The GoF is equal to 0.59, indicating that the structural model has a good goodness of fit.

Table 4. Fitting coefficient of the structural model.

	R^2	f^2	Q^2	GoF^1 *
UA	0.856	—	0.622	0.59
EE	—	0.001	0.392	—
FCs	—	0.070	0.247	—
PE	—	0.024	0.472	—
PJ	—	0.133	0.474	—
SE	—	0.223	0.547	—
SI	—	0.075	0.163	—
SM	—	0.045	0.377	—

Note: * GoF^1 = sqrt (average (AVE) × average (R^2)).

5.4. Hypothesis Testing

In this paper, the bootstrap sampling algorithm in SmartPLS3.2 software is used to select the re-sampling samples with a capacity of 5000, from the original data to test the significance of each path coefficient in the structural model. The results are shown in Table 5.

Table 5. Results of the path analysis of the structural model.

H	Path	Coefficient	SD	T	P	Result
H1	PE->UA	−0.124	0.145	0.857	0.392	No
H2	EE->UA	−0.001	0.094	0.01	0.992	No
H3	SI->UA	0.19 *	0.08	2.386	0.017	Yes
H4	FC->UA	0.177 **	0.067	2.626	0.009	Yes
H5	PJ->UA	0.307 **	0.1	3.06	0.002	Yes
H6	SM->UA	0.13 *	0.066	1.973	0.049	Yes
H7	SE->UA	0.355 **	0.103	3.454	0.001	Yes

Note: ** $p < 0.05$, * $p < 0.1$.

From Table 5, we can see that SI ($\beta = 0.19$, $p = 0.017 < 0.05$), FCs ($\beta = 0.177$, $p = 0.009 < 0.01$), PJ ($\beta = 0.307$, $p = 0.002 < 0.01$), SM ($\beta = 0.13$, $p = 0.049 < 0.05$), SE ($\beta = 0.355$, $p = 0.001 < 0.01$) had a significantly positive impact on the acceptance of blended learning (H3, H4, H5, H6, H7 were valid),while PE ($\beta = -0.124$, $p = 0.392 > 0.05$) and EE ($\beta = -0.001$, $p = 0.992 > 0.05$) had no significant influence on the acceptance of blended learning (H1 and H2 were not valid).

To examine the gender, grade, voluntariness and experience of the four variables adjusted action, the grouping study sample, according to the gender, can be divided into boys and girls' groups, the grade is divided into a junior group (grade one) and senior (grade two and grade three group), the subject type was divided into theory and practice class groups, for the user experience, there was the experienced and inexperienced groups.

Since PE ($\beta = -0.124$, $p = 0.392 > 0.05$) and EE ($\beta = -0.001$, $p = 0.992 > 0.05$) had no significant effect on the acceptance of blended learning, the corresponding adjustment hypothesis did not need to be tested. A regression operation is carried out by setting the moderating variables and cross-terms of each potential variable, to obtain the changed R^2, effect coefficient and *p*-value.

To test the adjustment effect, first set the adjustment variable and the cross term of each latent variable, then do the regression operation on them. Finally, the R^2, effect coefficient and *p* value after the change are obtained to measure. The results showed that the four moderating variables (gender, grade, voluntariness, and experience) had a weak influence on the change of R^2 and their *p* values did not meet the level of statistical significance, indicating no moderating effect. The final hypothesis test result model is shown in Figure 4.

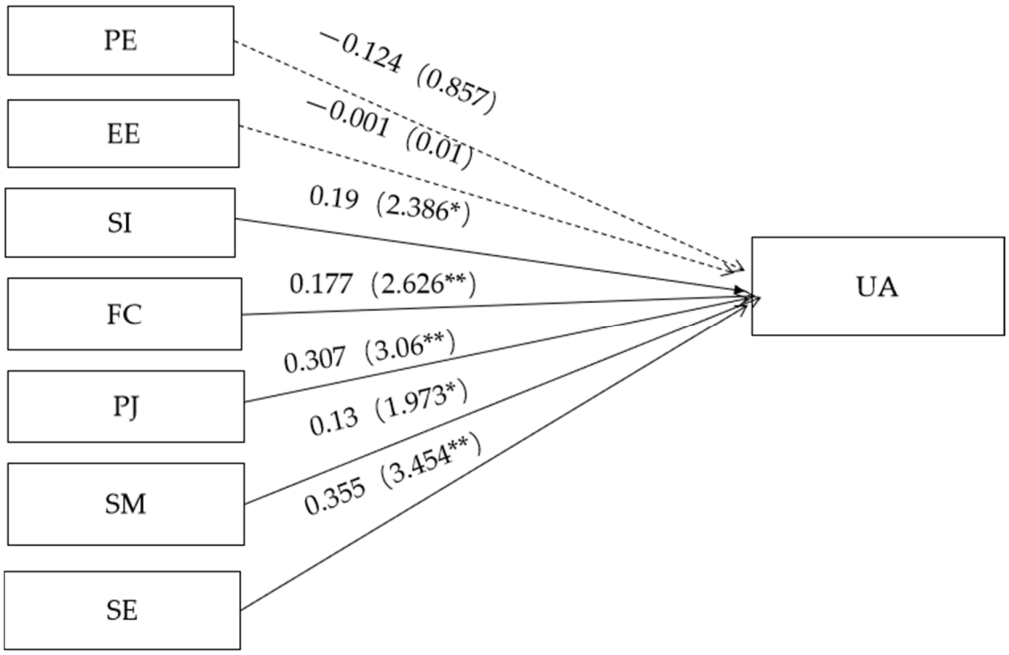

Figure 4. The result of the Hypothetical Model. (** $p < 0.05$, * $p < 0.1$).

6. Discussion

6.1. Principal Findings

The PE (H1, β = −0.124) had a relatively low impact on the acceptance intention of blended learning. The result is consistent with previous research on the social networking services' acceptance of the elderly population [30]. The reasons might be as follows: it is related to the characteristics of secondary vocational students. Most secondary vocational students lack the learning motivation, have a poor learning initiative, and do not care about grades. They only pay attention to the fun in the learning process and the effect of interaction with teachers and students, but they do not pay much attention to the improvement of the cultural performance and the learning effect through blended learning. The EE (H2, β = −0.001) also had a relatively low impact on the acceptance intention of blended learning. The reason might be that students have become familiar with using high-tech services and may think that adopting blended learning does not require much effort [31].

Meanwhile, SI (H3, β = 0.19), FCs (H4, β = 0.177), PJ (H5, β = 0.307), SM (H6, β = 0.13) and SE (H7, β = 0.355 **) had significant positive effects on the acceptance of blended learning. The result is consistent with the previous research [32–35]. The most influential factor affecting students' acceptance intention is SE. The more self-efficacy the students have, the more confident they are to solve the problems in the blended learning process, and they are more likely to accept the blended learning. The result is consistent with previous research on library self-service acceptance [36]. Additionally, the PJ had a relatively high acceptance intention of students, in line with previous MOOC service cases [37]. Moreover, SI, FCs, and SM had a relatively low impact on the acceptance intention of students, in line with previous cases [38–41].

The four moderating variables of gender, grade, voluntariness, and experience had no significant influence on each path. According to the Chen research, the empirical analysis of the influencing factors of the online learning behavior, based on UTAUT showed that the four control variables (gender, grade, major, and Internet frequency) had no significant influence on the online learning intention [36]. Based on the UTAUT model and the learning interaction theory, Xu et al. constructed the influencing factors model of college students' continuous learning behavior in the online learning environment. The study showed no significant difference in the grades and learning experience of college students' continuous learning behavior [33]. In this study, the four control variables had no significant influence

on each path. Perhaps because blended learning in secondary vocational schools is a new learning environment, most students do not have a rich experience in using it and students do not have autonomy over the location of the class.

6.2. Contributions and Implications

This research has both theoretical and practical implications. On a theoretical level, through the systematic analysis of the relevant models of technology acceptance at home and abroad and the existing research results, combined with the specific situation of blended learning for secondary vocational students, this paper constructs a research model of the acceptance of blended learning for secondary vocational students and explores the internal influence mechanism of the blended learning acceptance for secondary vocational students. It provides a new perspective for the domestic and foreign research on student groups and technology acceptance, complements and improves the existing research on blended learning acceptance, enriches and develops the domestic empirical research on blended learning, and has a certain reference significance for the research in this field.

On a practical level, based on the model and data, this paper carries out an empirical study on the acceptance of blended learning for secondary vocational students and analyzes the factors that affect the acceptance of blended learning, according to the empirical results, which can provide certain guidance for secondary vocational schools that have or will carry out blended learning reforms. At the same time, this paper takes secondary vocational students as the investigation object, enriches the investigation group of the acceptance of blended learning, and has practical reference significance for grasping the acceptance of blended learning of students.

6.3. Limitations and Future Research

This study has some limitations. On the one hand, the research object of the paper is only selected from some representative secondary vocational schools in Zhejiang province. The survey scope is narrow and the sample size is small, which impacts the applicability and scientificity of the paper evaluation model. In the follow-up research, the scope of the investigation can be expanded to continue to study the acceptance of blended learning among secondary vocational school students of other provinces and even the whole country and other majors, to enhance the universality of the research conclusions of the paper. The current phase of the blended learning research puts forward more requirements on teachers in classroom learning. Teachers need to conduct an in-depth analysis, design each learning link and knowledge, and make full use of the technological advantages to support the learning process through the use of advanced data visualization techniques for a complex of effective learning activities. Once analyzed and reasonably displayed, it can efficiently find the study of new problems, generate positive feedback, and influence the educational practices.

On the other hand, although the research in this paper adds new variables, based on the previous model, there are far more factors affecting the acceptance of blended learning among secondary vocational students. At the same time, this paper only researched the influencing factors of PE, EE, SI, FCs, PJ, SM, and SE on the acceptance of blended learning. Once the students use blended learning up to a certain stage of familiarity, we can specifically analyze the relationship between the variables to promote the students' acceptance of blended learning. Therefore, more appropriate variables should be added in the subsequent study to make a more systematic and comprehensive analysis. To enhance the comprehensiveness and explanatory power of the model.

Any learning model needs a long and repeated examination process and so does the blended learning model. It is necessary to adjust, modify, and improve the learning mode according to the repeatedly detected feedback on the learning application of the subject. The blended learning model can be promoted only when proven effective many times. Researchers of subsequent blended learning activities should not only develop theoretical research but, more importantly, carry out large-scale empirical research on experimental

objects to provide strong theoretical support for teachers in the process of education and learning, to face the challenges of education and learning reforms in the information age.

7. Conclusions

This study aimed to analyze the acceptance intention of blended learning in secondary vocational school students. This study adopted the modified model of UTAUT, involving secondary vocational school students' characteristics to explain the behavioral acceptance of blended learning from students 'perceptions. The results indicated that students' perceptions of SI, FCs, PJ, SM, and SE could positively anticipate UA to accept blended learning, having a relatively strong influence from SE and PJ. Furthermore, EE has an insignificant influence on UA. It implies that considering stimulating students' learning motivation and designing achievement evaluations, as well as students' perceptions of technologies, it is essential to evaluate the acceptance of blended learning [28,30]. The findings implied that the acceptance of blended learning needs to be evaluated considering the student's perceptions of technologies and internal learning factors. Theoretically, this study supports the applicability of the integrated model of UTAUT and the newly modified measurement items of UTAUT, reflecting the acceptance intention of blended learning, providing empirical evidence during the pandemic era in China. This study can provide theoretical support and practical guidance for improving the blended learning quality in secondary vocational schools.

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Data Availability Statement: Not applicable.

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Appendix A

Table A1. Items of variables.

Variable	Items	Cronbach α
PE	1. I find blended learning beneficial to my study. 2. Blended learning helps me to finish my study task more quickly. 3. If the teachers use blended learning, my academic performance will improve.	0.830
EE	1. It is easy for me to carry out my studies skillfully in mixed-class learning. 2. I find it very easy to learn after using blended learning. 3. The knowledge taught in blended instruction is clear and easy to understand.	0.794
FCs	1. There are specific people (or teams) who can help with the difficulties of implementing blended learning, such as a broken tablet, an unlogged platform, and so on. 2. Hybrid learning and traditional learning complement each other.	0.667
SI	1. Generally speaking, the school advocates and supports the teachers to carry out blended learning. 2. The people who matter to me think I should accept blended learning.	0.83

Table A1. *Cont.*

Variable	Items	Cronbach α
PJ	1. I think blended learning can help me to improve my creativity. 2. I think blended learning is fun. 3. Blended learning makes me feel very happy when I study. 4. I think blended learning can improve my imagination by getting information.	0.848
SM	1. I can effectively manage my study time and finish my homework on time. 2. I can learn on my own. 3. I am very disciplined in my studies and it is easy for me to set aside time for reading and homework.	0.782
SE	1. In the process of blended learning, I have more opportunities to interact with my teachers. 2. In the process of blended learning, I can communicate with other students. 3. I find help when I encounter difficulties or problems in the blended learning process.	0.868
UA	1. I would like to continue to use blended learning. 2. I will continue to accept blended learning in future classes. 3. I like blended learning. 4. I would recommend blended learning to my classmates, friends, or peers. 5. I hope there will be more opportunities to learn or acquire knowledge through blended learning in the future.	0.917

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