Research on the Influencing Factors of University Students’ Learning Ability Satisfaction under the Blended Learning Model

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Abstract: At present, the learning ability satisfaction of university students under the blended learning mode is low, and this has an impact on the effect of teaching and students’ learning experiences. In order to effectively improve learning ability satisfaction, empirical research and a structural equation model were used to explore the influencing factors of university students’ learning ability satisfaction. This study identified the influencing factors of university students’ learning ability satisfaction under the blended learning model, and constructed a structural equation model of these factors based on their relationship with learning ability satisfaction. The model was verified and optimized to determine the weight of factors that affected university students’ learning ability satisfaction. The study showed that the external and internal factors with the greatest effect on university students’ learning ability satisfaction were resource support and learning self-efficacy, respectively. Internal influencing factors had a greater impact on the satisfaction of university students’ learning abilities than external factors. This study will expand the existing research perspective on learning ability satisfaction, provide important references for improving curriculum design and teaching effectiveness, and provide a theoretical basis for solving various practical questions caused by low learning ability satisfaction in teaching practice.

Keywords: blended learning; learning ability; satisfaction; influencing factor

1. Introduction

Blended learning is a teaching method that combines online learning and in-person instruction [1]. Blended learning is defined as a combination of digital and face-to-face content delivery method [2]. Blended learning is a teaching or learning method that systematically includes elements such as the student, technology, environment, and methods involved in the teaching and learning process. It focuses on the development of individual cognition, skills, and emotions, thus improving teaching and learning performance [3,4]. The benefits of blended learning are flexibility, opportunities for staff–student interaction, student engagement in learning, opportunities for continuous improvement, and so on [5]. The blended learning model leads the digitalization of China’s higher education to a new stage [6]. The latest statistics from the Ministry of Education of the People’s Republic of China indicate that the number of massive open online courses (MOOCs) in China has reached 62,000, with 402 million users and 979 million learners as of November 2022. Both the number of MOOCs and learners are ranked first in the world. Chinese scholars proposed a new idea of using MOOCs as a driving force to continuously promote the deepening of education and teaching reform at the 2022 World MOOC and Online Education
Conference, which is gradually changing the form of higher education. Learning satisfaction reflects an individual’s learning experience, which is also an important indicator of the talent cultivation quality in higher education [7]. Students have a good grasp of knowledge and a high degree of satisfaction under the blended learning model [8]. Blended learning has a wide application range and a good learning effect [9]. The demand for learners’ abilities is more diverse and complex in the process of blended learning [10]. Therefore, it is important to conduct in-depth research on learners’ learning ability satisfaction in the blended learning model of higher education.

In existing research, learning satisfaction is often used as an “observation indicator” and evaluation tool to measure learners’ intuitive feelings during the learning process [11]. At present, research mainly focuses on online learning regarding the COVID-19 pandemic, while the research on satisfaction in blended learning environments is relatively small. The different dimensions of blended learning have a positive contribution to student satisfaction [12]. The comparative analysis of blended learning and complete online learning shows that there is a significant difference in the impact of perceived usefulness on usage intention [13]. A dimension that has a significant influence on student learning includes the educator’s role in establishing a strong educator presence in online settings [14]. However, there is very little research on the relationship between influencing factors of learning ability satisfaction in the blended learning environment. At the same time, there are also issues of confusion between the concepts of teaching satisfaction and learning satisfaction, as well as an unclear understanding of the foothold of learning satisfaction research [15]. Scholars draw on the ideas of self-determination theory to divide learning satisfaction into learning one’s own satisfaction, learning ability satisfaction, and learning belonging satisfaction [16]. Learning ability satisfaction is the degree to which students meet their ability needs during the learning process, and learning ability needs are the basic desires of university students to pursue learning effectiveness, learning ability, and learning success; learning ability is the sum of various abilities and potential that can be learned [17]. The demand for learning ability is mainly reflected in individuals who are constantly transforming potential learning abilities into actual learning abilities through learning and training, which gradually evolve towards higher-order abilities, and they obtain a feeling of satisfaction in the process of achieving ability goals. The demand for learning ability can promote university students to pursue positive learning outcomes, stimulate positive learning behaviors, and try to avoid falling into low-energy learning situations [18]. Autonomous learning ability affects mixed cooperative learning satisfaction through the mediating role of positive interdependence [19].

Learning ability satisfaction is influenced by multiple factors [20]. The influencing factors of learning ability satisfaction include internal influencing factors such as learning motivation, learning self-efficacy, and self-regulated learning ability, as well as external influencing factors such as teacher support, platform support, and peer support [21–23]. Learning motivation stimulates and maintains an individual’s learning behavior, which is a motivational tendency towards a certain learning goal [24]. Learning motivation determines the learning goal of learners’ participation in blended learning, which is the reason for causing and maintaining learning behavior [25]. Learning motivation can stimulate learners’ internal drive, evoke internal activation, and generate psychological experiences such as desire and expectation for knowledge, which leads to certain learning behaviors [26]. Learning motivation triggers the learning process, and the learning process generates learning motivation for subsequent behaviors [27]. Learning motivation is one of the important influencing factors of learning ability satisfaction [28]. Learning motivation can be divided into internal learning motivation and external learning motivation according to the different sources of motivation [29]. Internal learning motivation arises from an individual’s internal needs, and a strong internal learning motivation makes learners prefer challenges, tend to choose and solve complex questions, and engage in a wider range of learning activities out of curiosity and hobbies [30]. External learning motivation is caused by external incentives, and strong external learning motivation makes learners tend to
choose the simple tasks, focus on learning competition, rely on others’ evaluations, and focus on pursuing external rewards [31].

Learning self-efficacy among the internal influencing factors of learning ability satisfaction is the individual’s confidence in completing a learning task [32]. Learners form self-efficacy by integrating previous learning experiences, similar learners’ behavior results, learning feedback, and other information about the environment [33]. Learning self-efficacy plays an important role in the process of blended learning, which affects the learners’ choice of learning activities and the learners’ persistence and effort in learning activities [34]. Learners with high self-efficacy can make full use of their experience to solve complex situations and challenging learning tasks [35]. When learners with low self-efficacy encounter difficulties, they often hinder the use of experience by magnifying their own weaknesses and difficulties [36]. This leads learners to lower their learning expectations and standards, reduce their efforts, and even give up their efforts to alleviate their own pressure [37]. Learning self-efficacy is divided into learning result expectation, learning effort degree, and learning control sense according to the characteristics of blended learning and Bandura’s ternary interaction theory [38]. Learning outcome expectation is learners’ speculation and judgment on whether they can complete learning tasks [39]. Learning effort degree is learners’ understanding of whether they can work hard [40]. Learning control sense is learners’ feeling of controlling blended learning interactions and learning behavior [41].

As one of the internal influencing factors of learning ability satisfaction, self-regulated learning is a learning process in which learners actively motivate themselves and use appropriate learning strategies [42]. Self-regulated learning combines initiative and constructiveness. According to the information circulation process, self-regulated learning is divided into defining tasks, setting goals, executing strategies, and metacognitive regulation [43]. Learners use their knowledge reserves to explain and disassemble learning tasks, which determine the favorable conditions and difficulties for completing the tasks. Learners make learning objectives and plans based on the definition of learning tasks, which choose learning strategies. Metacognition regulates the degree of consistency between learning progress and goals, which adjusts learning strategies or goals [44]. The comparative analysis of the initial goal and learning outcomes after obtaining learning results forms the guiding basis for learners’ next round of self-regulated learning [45].

Teacher support in the external influencing factors of learning ability satisfaction is the perceived degree by learners that teachers actively respond to learning questions and promote learning [49]. Learning activities cannot be separated from teachers’ teaching and guidance, and effective teacher support can stimulate students’ curiosity and enable learners to focus on exploring the learning content [50]. Teacher support positively affects students’ learning ability satisfaction [51]. Teacher’s teaching organization and design, and timely feedback and response have a significant impact on learning ability satisfaction [14]. Communication and interaction between teachers and students can promote the successful implementation of learning activities [52]. Communication and interaction between teachers and students are important influencing factors of learning ability satisfaction [53]. The dimension of teacher support after summarizing the specific explanations of teacher support is divided into teacher–student communication, teacher feedback, and teaching organization [54]. Teacher–student communication is the interaction between teachers and students in terms of knowledge, emotion, and values in the process of blended learning either face to face or through a platform [55]. Teacher feedback is an evaluation of students’
performance and response to their needs in the teaching process. Teaching organization is the purposeful presentation process of teaching content in the teaching process [56].

Resource support in the external influencing factors of learning ability satisfaction is the resources used by learners to support learning in the process of blended learning [57]. Learning resources support learning according to the definition of the American Society for Education and Communication, which include teaching materials, support systems, and learning environments [58]. The usefulness and accessibility of the platform are important influencing factors for learning ability satisfaction [59]. The form and quality of resource content, platform functionality, and online presence have been identified as key factors affecting learning ability satisfaction [60]. According to the definition and influencing factors of learning resources, the dimension of resource support is specifically divided into perceived content usefulness, perceived platform accessibility, and online presence [61]. Perceived content usefulness is the extent to which learners believe that the teaching materials used in blended learning improve learning performance [62]. Perceived platform accessibility is the extent to which the learning platform function support system improves the learning performance of learners in the blended learning process [63]. Online presence is the extent to which learners feel the real existence of themselves and others in the blended learning environment [64].

As one of the external influencing factors of learning ability satisfaction, peer support is the promoting effect that learners perceive other learners’ behaviors have on their own learning [65]. Peer support is an important social interaction for university students, where learners collaborate and help promote individual learning and growth through mutual interaction [66]. Based on self-directed learning and teacher guidance, learners promote learning with other learners through explanations, discussions, mutual evaluations, etc., which fully play to the learner’s subjectivity and stimulates their enthusiasm [67]. The reduction of peer interaction in blended learning affects learning ability satisfaction [68]. Peer interaction in the blended learning model is one of the important influencing factors on learning ability satisfaction [69]. The interaction between students affects students’ satisfaction with the teaching process [70]. Peer support is mainly reflected in three aspects: emotional support, information support, and instrumental support. Emotional support provides learners with emotional care by listening, attention, and encouragement. Information support shares valuable information with learners through communication, transmission, and other means to solve learning questions. Instrumental support provides specific assistance to learners in solving learning questions [71].

Under the current blended learning model, the author explored whether the above factors had an impact on learning ability satisfaction, influence size, and mechanism of action between the influencing factors. This study collected data through empirical research and used structural equations to validate and revise theoretical hypothesis models, which obtained the effect paths and coefficients of each influencing factor on learning ability satisfaction. The objective is to solve the following questions:

(1) What are the main influencing factors of learning ability satisfaction?
(2) What are the relationship paths between the main influencing factors of learning ability satisfaction?
(3) How to verify the influencing factors of learning ability satisfaction and determine the effect size of each influencing factor?

This study provides a theoretical basis for goal formation and a clear, hierarchical, scientific blended learning model to enhance university students’ learning ability satisfaction.

2. Materials and Methods

2.1. Data Collection

This study took university students who were participating in blended learning as the subjects of investigation, which covered students from different majors, different grades, and different regions of origin. A total of 1200 questionnaires were distributed for this survey. Invalid questionnaires, such as those with short answer times, identical options,
multiple choices, and missed choices were excluded, leaving 1073 valid questionnaires; the effective rate was 89.4%. The basic information mainly included gender, grade, origin place of the student, application status of economic interested parties, major category, score ranking, etc. Among the participants in the survey, there were 651 male participants and 422 female participants. There were 38 freshmen, 408 sophomores, 209 juniors, and 651 graduates. The distribution of university students was 373 in Northeast China, 189 in North China, 191 in Central China, 108 in East China, 67 in South China, 76 in Northwest China, and 69 in Southwest China. The 307 university students had applied for economic attention targets during their undergraduate studies, while 766 university students had not applied for economic attention targets. Professional analysis showed that there were 114 university students studying philosophy, 31 university students studying literature, 116 university students studying economics, 12 university students studying law, 26 university students studying education, 10 university students studying history, 94 university students studying science, 386 university students studying engineering, 122 university students studying agriculture, 34 university students studying medicine, 89 university students studying management, and 39 university students studying art. The number of students whose academic performance ranked in the top 20%, 21–40%, 41–60%, 61–80%, and 81–100% of their respective grades was 273, 301, 271, 138, and 90, respectively. The respondents were all students from universities supported by the “985 Project” in China, and the research conclusions were limited by the university level.

2.2. Methods

2.2.1. Theoretical Model Construction

The theory of learning conditions suggests that both internal and external influencing factors work together during the learning process. Internal influencing factors are determined by the internal conditions of learners and used to regulate their own internal processes such as attention, memory, internalization, and thinking, which are the inherent internal state of students [72]. During learning, internal structure transforms or processes the stimuli received by learners in various ways. External influencing factors come from the conditions of the learner’s environment and are other factors that play a role during the learning process in addition to internal influencing factors. External conditions are the structural forms of input stimuli for students. Higher education provides a series of organized external factors for the development of learners [73]. The influencing factors of learning ability satisfaction are divided into internal influencing factors and external influencing factors according to the theory of learning conditions. The internal influencing factors of learning ability satisfaction are mainly the intrinsic factors of students, which include learning motivation, learning self-efficacy, and self-regulated learning ability [15]. The external influencing factors of learning ability satisfaction are other conditional factors besides the internal factors in the learning process, which mainly include teacher support, platform support, and peer support [74]. External factors affect learning ability satisfaction by acting on internal factors. This study constructed a theoretical model and proposed relevant hypotheses for the convenience of analysis (Figure 1).

Figure 1 shows that H14 is a significant positive impact of learning motivation on learning ability satisfaction, and learning motivation is one of the important influencing factors of learning satisfaction [28,59]. Learning self-efficacy is one of the important influencing factors of learning satisfaction [37,52,68]. H13 shows that learning self-efficacy has a significant positive impact on learning motivation. The content of the H13 hypothesis is that learning self-efficacy has an impact on learning motivation. Multiple studies have shown an undeniable correlation between learning self-efficacy and learning motivation [75–77]. In order to accurately and comprehensively describe the relationship effects between different influencing factors, this hypothesis was established. The H15 is that learning self-efficacy has a significant positive impact on learning ability satisfaction. H16 is a significant positive impact of self-regulated learning ability on learning ability satisfaction; Self-regulated learning ability is one of the important factors affecting learning satisfaction [46,78]. The
H1, H3, and H4 are significant positive impact of teacher support on learning self-efficacy, self-regulated learning ability, and learning motivation, respectively. Teacher support positively affects students’ learning satisfaction [79]. The H2 is a significant positive impact of teacher support on learning ability satisfaction, and the H5, H6, H7, and H8 are significant positive impact of resource support on learning motivation, self-regulated learning ability, learning self-efficacy, and learning ability satisfaction, respectively. The usefulness and ease of the platform are important influencing factors for learning satisfaction [52,53,59]. The H9, H10, H11, and H12 are significant positive impact of peer support on learning motivation, self-regulated learning ability, learning self-efficacy, and learning ability satisfaction, respectively. The reduction in peer interaction in blended learning affects learning satisfaction [68]. Peer interaction is one of the factors affecting learning satisfaction in blended learning mode [80]. Interaction between students affects students’ satisfaction with the teaching process [70].

Figure 1. Theoretical hypothesis model.

2.2.2. Tool Design

A literature review, interviews, and expert consultation methods were used to conduct research, and the data was collected in the form of a questionnaire survey. The 20 university students who participated in blended learning were selected for an interview survey at the initial stage of the questionnaire design. Then, some influencing factor variables obtained from the survey results were mutually verified with the conclusions obtained from literature analysis. Finally, the influencing factor variables of learning ability satisfaction were further revised and determined using the expert consultation method. The influencing factors proposed based on the literature were mutually verified and supplemented, and the influencing factors of university students’ learning ability satisfaction under the blended learning model were formulated as learning motivation, learning self-efficacy, self-regulated learning ability, teacher support, peer support, and resource support. The dimension division of learning ability satisfaction and influencing factors was proposed (Table S1). The questionnaire survey was mainly designed to understand the potential variables corresponding to the hypothetical model. The questions corresponding to each potential variable are shown in Table S2. The questions corresponding to the potential variables in the questionnaire were mainly based on existing literature questionnaires, and some modifications were made on this basis. The measurement items were scored using the five-point option scoring method of the Richter scale [81] with option values ranging from “strongly disagree (1)” to “strongly agree (5)”. The AMOS 24.0 software was used to analyze the collected questionnaire data in the statistical method.
The questionnaire was divided into the measurement of learning ability satisfaction and the influencing factor scale. The questionnaire items of measuring learning ability satisfaction were mainly revised from the items of basic psychological needs meeting the ability needs in the measurement maturity scale compiled by Gagné [82]. The factors influencing the learning ability satisfaction scale were mainly the items of the learning motivation scale developed by scholars [83]. The scale items referenced for learning self-efficacy mainly came from the learning self-efficacy scale developed by scholars [84]. The scale items for self-regulated learning ability mainly came from the learning self-efficacy scale developed by scholars [85]. The scale items referred to the dimension of teacher support mainly came from the items related to teacher support in scholars’ research [86,87]. The scale items referred to the resource support dimension mainly came from scholars’ research on teacher support [88]. The scale items referred to the peer support dimension mainly came from the peer support section of the social support scale developed by scholars [89].

3. Results
3.1. Analysis Results of Learning Ability Satisfaction Model
3.1.1. Construction of a Learning Ability Satisfaction Model
Before the scale was officially used, a pre-test was required. The pre-test questionnaire data was divided into two parts. One part of the data in the pre-test questionnaire was subjected to item analysis and exploratory factor analysis. The maximum variance rotation method was used to eliminate items with loads below 0.5 in each factor, and the remaining items had good structural validity. The other half of the data was selected for confirmatory factor analysis on the remaining items. The chi square free ratio, root mean square error of approximation (RMSEA), comparative fit index (CFI), Tucker–Lewis index (TLI), and incremental fit index (IFI) indicators all met the standards, which indicated that the questionnaire had structural validity. The aggregation validity of the questionnaire on factors influencing learning satisfaction indicated that the average variance extracted (AVE) values corresponding to the factors (0.551, 0.581, 0.570, 0.554, 0.622, 0.645) were all greater than 0.5, and the critical ratio (CR) values (0.906, 0.847, 0.886, 0.882, 0.929, 0.916) were all higher than 0.7, which indicated that the questionnaire had good aggregation validity. The reliability of learning motivation was 0.901, the reliability of learning self-efficacy was 0.843, the reliability of self-regulated learning ability was 0.879, the reliability of teacher support was 0.881, the reliability of resource support was 0.928, and the reliability of peer support was 0.914. The overall reliability was 0.963. After reliability and validity testing and scale revision, a formal questionnaire was formed.

The collected questionnaire data were analyzed using AMOS 24.0 software. First, seven latent variables were set on the main interface, which included external factors (teacher support, resource support, and peer support) and internal factors (learning motivation, learning self-efficacy, self-regulated learning ability, and learning self-satisfaction) of learning ability satisfaction. The 44 observation variables were set, and the arrow direction represented the set residual variable. There were three exogenous latent variables and four endogenous latent variables among the seven latent variables. The hypothetical model figure of the influencing factors for learning ability satisfaction using AMOS is shown in Figure 2, and the question solved in Figure 2 is shown in Table S3. The fitting degree of the initial model was evaluated, and the specific fitting results are shown in Table 1.

Analysis found that some fitting indices were unsatisfactory, especially when CMIN/DF (4.041) was higher than the reference value. It was therefore necessary to modify the model. The model fit index (MI) was the minimum chi square value to which the overall model decreased after adding a certain path. The model was modified based on the MI value to improve the overall adaptability. The correction needed to start from the path with a higher MI value. One path was added at a time, and the indicator for modifying the newly added path was greater than 1. The improvement degree was closely monitored during the correction process. When the model was suitable for configuration, the correction was
stopped. This study made multiple revisions to the model based on the above correction principles and the correction indicators presented after operation. The specific factors affecting learning ability satisfaction model correction are shown in Table 2.

![Hypothetical model of influencing factors on learning ability satisfaction drawn using AMOS](image)

**Figure 2.** Hypothetical model of influencing factors on learning ability satisfaction drawn using AMOS (the ‘1’ in the second vertical column represents this column).

**Table 1.** Model fitting results of influencing factors on learning ability satisfaction.

<table>
<thead>
<tr>
<th>Model</th>
<th>CMIN/DF</th>
<th>GFI</th>
<th>CFI</th>
<th>NFI</th>
<th>IFI</th>
<th>RMR</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference value</td>
<td>1–3</td>
<td>&gt;0.9</td>
<td>&gt;0.9</td>
<td>&gt;0.9</td>
<td>&gt;0.9</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Fitting numerical value</td>
<td>4.041</td>
<td>0.855</td>
<td>0.898</td>
<td>0.869</td>
<td>0.899</td>
<td>0.057</td>
<td>0.053</td>
</tr>
<tr>
<td>Judgment result</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Note: the CMIN is chi square, the DF is degrees of freedom, the GFI is the goodness-of-fit index, the CFI is the comparative fit index, the NFI is the normed fit index, the IFI is the incremental fit index, the RMR is the root mean square residual, and the RMSEA is the root mean square error of approximation.

3.1.2. Fitting Evaluation of Influencing Factors Model for the Learning Ability Satisfaction

In order to analyze the collinearity question between research dimensions, the author conducted exploratory factor analysis on the influencing factor items. The maximum variance method was used to extract a total of six factors with feature roots greater than 1, namely, six principal components. The variance interpretation rates of six factors after rotation were 12.968%, 12.951%, 11.991%, 11.476%, 10.665%, and 8.270%. The cumulative variance interpretation rate was 68.321%, which was higher than the minimum requirement of 50%. Therefore, the extracted factors explained most of the information.

The fitting results of the modified learning ability satisfaction influencing factor model are shown in Table 3, and all indicators have basically met the standards. The fit degree of the model has been improved after multiple revisions, so the overall fit degree was good.
Table 2. Revised influencing factor models for learning ability satisfaction.

<table>
<thead>
<tr>
<th>Correction Times</th>
<th>Correction Type</th>
<th>Path Type</th>
<th>Correction Path</th>
<th>Correction Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Increase</td>
<td>Correlation</td>
<td>e45&lt;---&gt;e43</td>
<td>357.605</td>
</tr>
<tr>
<td>2</td>
<td>Increase</td>
<td>Correlation</td>
<td>e52&lt;---&gt;e83</td>
<td>273.231</td>
</tr>
<tr>
<td>3</td>
<td>Increase</td>
<td>Correlation</td>
<td>e78&lt;---&gt;e79</td>
<td>146.043</td>
</tr>
<tr>
<td>4</td>
<td>Increase</td>
<td>Correlation</td>
<td>e52&lt;---&gt;e85</td>
<td>140.583</td>
</tr>
<tr>
<td>5</td>
<td>Increase</td>
<td>Correlation</td>
<td>e84&lt;---&gt;e85</td>
<td>110.606</td>
</tr>
<tr>
<td>6</td>
<td>Increase</td>
<td>Correlation</td>
<td>e80&lt;---&gt;e81</td>
<td>93.115</td>
</tr>
<tr>
<td>7</td>
<td>Increase</td>
<td>Correlation</td>
<td>e83&lt;---&gt;e85</td>
<td>89.483</td>
</tr>
<tr>
<td>8</td>
<td>Increase</td>
<td>Correlation</td>
<td>e83&lt;---&gt;e84</td>
<td>67.179</td>
</tr>
<tr>
<td>9</td>
<td>Increase</td>
<td>Correlation</td>
<td>e76&lt;---&gt;e77</td>
<td>52.499</td>
</tr>
<tr>
<td>10</td>
<td>Increase</td>
<td>Correlation</td>
<td>e82&lt;---&gt;e80</td>
<td>45.287</td>
</tr>
<tr>
<td>11</td>
<td>Increase</td>
<td>Correlation</td>
<td>e84&lt;---&gt;e86</td>
<td>40.064</td>
</tr>
<tr>
<td>12</td>
<td>Increase</td>
<td>Correlation</td>
<td>e2&lt;---&gt;e7</td>
<td>31.598</td>
</tr>
<tr>
<td>13</td>
<td>Increase</td>
<td>Correlation</td>
<td>e85&lt;---&gt;e86</td>
<td>23.771</td>
</tr>
</tbody>
</table>

Table 3. Fitting results of influencing factors model with revised learning ability satisfaction.

<table>
<thead>
<tr>
<th>Model</th>
<th>CMIN/DF</th>
<th>GFI</th>
<th>CFI</th>
<th>NFI</th>
<th>IFI</th>
<th>RMR</th>
<th>RMSEA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference value</td>
<td>1–3</td>
<td>&gt;0.9</td>
<td>&gt;0.9</td>
<td>&gt;0.9</td>
<td>&gt;0.9</td>
<td>&lt;0.05</td>
<td>&lt;0.05</td>
</tr>
<tr>
<td>Fitting value</td>
<td>2.892</td>
<td>0.899</td>
<td>0.938</td>
<td>0.908</td>
<td>0.938</td>
<td>0.046</td>
<td>0.042</td>
</tr>
<tr>
<td>Judgment result</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Note: the abbreviations in the table are the same as those in Table 1.

3.1.3. Hypothesis Testing of the Influencing Factors Model for Learning Ability Satisfaction

In order to clarify the action utility relationship between various influencing factors and learning ability satisfaction, the model hypothesis path proposed based on the completion of model fitting evaluation and correction in this study needed to be tested in order to construct an influencing factors model of learning ability satisfaction. The path hypothesis test results of the learning ability satisfaction influencing factor model formed after sorting and analysis are shown in Table 4.

Combining the hypothesis test results of the learning ability satisfaction influencing factor model in Table 4 and the standardized path coefficient of the learning ability satisfaction influencing factor model in Figure 3, 14 hypotheses were supported among the 16 hypotheses, and the question solved in Figure 3 is shown in Table S3. Unsupported hypothetical paths then needed to be removed. After deleting the unsupported assumed path, AMOS software was used to recalculate and analyze the results. The revised model parameters and model fitting indicators passed the test. The revised learning ability satisfaction influencing factor model and path coefficient are shown in Figures 4 and 5, and the question solved in Figure 4 is shown in Table S3. The analysis results showed that all assumptions except for H2 and H11 were valid.

3.1.4. Influencing Factors of the Learning Ability Satisfaction Model

According to the effect path and coefficient of influencing factors on learning ability satisfaction, teacher support mainly affected learning ability satisfaction through learning motivation, learning self-efficacy, and self-regulated learning ability. Resource support directly affected learning ability satisfaction, which also affected learning ability satisfaction by acting on learning motivation, learning self-efficacy and self-regulated learning ability. Peer support influenced learning ability satisfaction mainly through the role of learning motivation, learning self-efficacy, and self-regulated learning ability.
Table 4. Path hypothesis test results of the influencing factors model of learning ability satisfaction.

<table>
<thead>
<tr>
<th>Hypothetical Symbol</th>
<th>Route</th>
<th>Standard Deviation Regression Coefficient ($\beta$)</th>
<th>$p$ Value</th>
<th>Verification Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>H1</td>
<td>Learning motivation ← Teacher support</td>
<td>0.360</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H2</td>
<td>Learning ability satisfaction ← Teacher support</td>
<td>0.001</td>
<td>0.987</td>
<td>No support</td>
</tr>
<tr>
<td>H3</td>
<td>Learning self-efficacy ← Teacher support</td>
<td>0.178</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H4</td>
<td>Self-regulated learning ability ← Teacher support</td>
<td>0.175</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H5</td>
<td>Learning motivation ← Resource support</td>
<td>0.265</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H6</td>
<td>Learning self-efficacy ← Resource support</td>
<td>0.347</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H7</td>
<td>Learning ability satisfaction ← Resource support</td>
<td>0.182</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H8</td>
<td>Self-regulated learning ability ← Resource support</td>
<td>0.356</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H9</td>
<td>Learning motivation ← Peer Support</td>
<td>0.221</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H10</td>
<td>Learning self-efficacy ← Peer Support</td>
<td>0.154</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H11</td>
<td>Learning ability satisfaction ← Peer Support</td>
<td>-0.006</td>
<td>0.441</td>
<td>No support</td>
</tr>
<tr>
<td>H12</td>
<td>Self-regulated learning ability ← Peer Support</td>
<td>0.255</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H13</td>
<td>Learning motivation ← Learning self-efficacy</td>
<td>0.098</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H14</td>
<td>Learning ability satisfaction ← Learning motivation</td>
<td>0.234</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H15</td>
<td>Learning ability satisfaction ← Learning self-efficacy</td>
<td>0.480</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
<tr>
<td>H16</td>
<td>Learning ability satisfaction ← Self-regulated learning ability</td>
<td>0.335</td>
<td>$p &lt; 0.01$</td>
<td>Support</td>
</tr>
</tbody>
</table>
Figure 3. Standardized path coefficients of the influencing factors model for learning ability satisfaction (the standardized regression weights are in Table S4).

Figure 4. Modified influencing factors of learning ability satisfaction model (the standardized regression weights are in Table S5).
Figure 5. Path coefficient of the influencing factors model for revised learning ability satisfaction (**p < 0.01).

3.2. Influencing Factor’s Role in the Learning Ability Satisfaction

The weight and path of learning motivation in the influencing factor model were analyzed. Learning motivation had a direct impact on learning ability satisfaction (Table 5), and the direct effect value LM21 was 0.184. Therefore, the total action effect of learning motivation on learning ability satisfaction was 0.184. The weight and path of learning self-efficacy in the influencing factor model of learning ability satisfaction were analyzed, and learning self-efficacy had both direct and indirect effects on learning ability satisfaction. The effect of different paths between learning self-efficacy and learning ability satisfaction was calculated, and then these effect values were added to obtain the total effect of learning self-efficacy on learning ability satisfaction of 0.494. The weight and path of self-regulated learning ability in the influencing factor model were analyzed; self-regulated learning ability only had a direct effect on learning ability satisfaction, and the direct effect value SR21 was 0.327. Therefore, the total effect of self-regulated learning ability on learning ability satisfaction was 0.327.

The effect of different paths between teacher support and learning ability satisfaction was calculated, and then these effect values were added to obtain the total effect of teacher support on learning ability satisfaction of 0.215. The effect of different paths between resource support and learning ability satisfaction was calculated, and then these effect values were added to obtain the total effect of resource support on learning ability satisfaction of 0.500. The effect of different paths between peer support and learning ability satisfaction was calculated, and then these effect values were added to obtain the total effect value of 0.185 for peer support on learning ability satisfaction.

Based on the above contents, the specific effect values of different influencing factors on learning ability satisfaction were calculated and sorted according to the magnitude of the effect values. The impacts of each factor on learning ability satisfaction are shown in Figure 6.
<table>
<thead>
<tr>
<th>Item</th>
<th>Action</th>
<th>Progress</th>
<th>Index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Action effect of learning self-efficacy on learning ability satisfaction</strong></td>
<td>Direct action effect value</td>
<td>Learning self-efficacy $\rightarrow$ learning ability satisfaction</td>
<td>0.475</td>
</tr>
<tr>
<td></td>
<td>Indirect action effect value</td>
<td>Learning self-efficacy $\rightarrow$ learning motivation $\rightarrow$ learning ability satisfaction</td>
<td>0.019</td>
</tr>
<tr>
<td></td>
<td>Total action effect value</td>
<td></td>
<td>0.494</td>
</tr>
<tr>
<td><strong>Action effect of teacher support on learning ability satisfaction</strong></td>
<td>Indirect action effect value 1</td>
<td>Teacher support $\rightarrow$ learning motivation $\rightarrow$ learning ability satisfaction</td>
<td>0.066</td>
</tr>
<tr>
<td></td>
<td>Indirect action effect value 2</td>
<td>Teacher support $\rightarrow$ self-regulated learning ability $\rightarrow$ learning ability satisfaction</td>
<td>0.058</td>
</tr>
<tr>
<td></td>
<td>Indirect action effect value 3</td>
<td>Teacher support $\rightarrow$ Learning self-efficacy $\rightarrow$ learning ability satisfaction</td>
<td>0.087</td>
</tr>
<tr>
<td></td>
<td>Indirect action effect value 4</td>
<td>Teacher support $\rightarrow$ Learning self-efficacy $\rightarrow$ learning motivation $\rightarrow$ learning ability satisfaction</td>
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</tr>
<tr>
<td></td>
<td>Total action effect value</td>
<td></td>
<td>0.215</td>
</tr>
<tr>
<td><strong>Action effect of resource support on learning ability satisfaction</strong></td>
<td>Direct action effect value</td>
<td>Resource support $\rightarrow$ learning ability satisfaction</td>
<td>0.154</td>
</tr>
<tr>
<td></td>
<td>Indirect action effect value 1</td>
<td>Resource support $\rightarrow$ learning motivation $\rightarrow$ learning ability satisfaction</td>
<td>0.049</td>
</tr>
<tr>
<td></td>
<td>Indirect action effect value 2</td>
<td>Resource support $\rightarrow$ self-regulated learning ability $\rightarrow$ learning ability satisfaction</td>
<td>0.119</td>
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<td>Resource support $\rightarrow$ Learning self-efficacy $\rightarrow$ learning ability satisfaction</td>
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<tr>
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<td>Indirect action effect value 4</td>
<td>Resource support $\rightarrow$ Learning self-efficacy $\rightarrow$ learning motivation $\rightarrow$ learning ability satisfaction</td>
<td>0.007</td>
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<tr>
<td></td>
<td>Total action effect value</td>
<td></td>
<td>0.500</td>
</tr>
<tr>
<td><strong>Action effect of peer support on learning ability satisfaction</strong></td>
<td>Indirect action effect value 1</td>
<td>Peer support $\rightarrow$ learning motivation $\rightarrow$ learning ability satisfaction</td>
<td>0.040</td>
</tr>
<tr>
<td></td>
<td>Indirect action effect value 2</td>
<td>Peer support $\rightarrow$ self-regulated learning ability $\rightarrow$ learning ability satisfaction</td>
<td>0.079</td>
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<tr>
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<td>Indirect action effect value 3</td>
<td>Peer support $\rightarrow$ Learning self-efficacy $\rightarrow$ learning ability satisfaction</td>
<td>0.063</td>
</tr>
<tr>
<td></td>
<td>Indirect action effect value 4</td>
<td>Peer support $\rightarrow$ Learning self-efficacy $\rightarrow$ learning motivation $\rightarrow$ learning ability satisfaction</td>
<td>0.003</td>
</tr>
<tr>
<td></td>
<td>Total action effect value</td>
<td></td>
<td>0.185</td>
</tr>
</tbody>
</table>
4. Discussion

The impact of external factors on learning ability satisfaction was more extensive. Among the internal influencing factors, other researchers analyzed the impact of learning motivation [90], self-regulated learning ability [91], and self-efficacy [33] on learning ability satisfaction. However, there was a lack of analysis of the interaction and effect paths between internal and external influencing factors. This study hypothesized and verified the pathways of different influencing factors based on the theory of learning conditions.

4.1. Analysis of Internal and External Influencing Factors on Learning Ability Satisfaction

4.1.1. Impact of Internal Factors on Learning Ability Satisfaction

Learning ability satisfaction affected teachers’ teaching effectiveness and students’ learning experience, which thereby affected students’ learning outcomes [92]. It was of great significance to analyze the impact of internal factors on learning ability satisfaction to improve learning efficiency. According to the revised influencing factor model of learning ability satisfaction, learning motivation had a direct and significant impact on learning ability satisfaction ($\beta = 0.184, p < 0.01$). This indicated that stimulating learning motivation effectively improved students’ learning abilities satisfaction. Learning motivation was an internal initiating mechanism that stimulated and maintained individual learning activities towards a certain learning goal, which was also an important factor in successful teaching [93]. Learning process of flipped learning, the role of professors, and the utilization of necessary professional knowledge were important ways to stimulate learning motivation and improve satisfaction with learning abilities [94]. Learning self-efficacy had a direct positive impact on learning ability satisfaction ($\beta = 0.475, p < 0.01$). This shows that the higher the students’ self-efficacy, the stronger their learning ability satisfaction was. Learning self-efficacy had a significant impact on learning motivation ($\beta = 0.105, p < 0.01$), and learning self-efficacy also affected learning ability satisfaction through learning motivation. Students had a high sense of self-efficacy and a strong learning motivation in the process of learning, so the satisfaction level of learning ability was also high [95,96].

The self-regulated learning ability of the revised learning ability satisfaction influencing factor model had a direct and significant impact on learning ability satisfaction ($\beta = 0.327, p < 0.01$). This indicated that stimulating self-regulated learning ability effectively improved students’ learning ability satisfaction. In summary, learning motivation, learning
self-efficacy, self-regulated learning ability, and other internal factors had a certain impact on learning ability satisfaction. Internal factors are an important influence on improving learning ability satisfaction.

4.1.2. Influence Analysis of External Factors on the Learning Ability Satisfaction

In addition to internal factors, external factors were also important factors that affected learning ability satisfaction. From the influencing factor model analysis of learning ability satisfaction, the hypothetical relationship between teacher support and learning ability satisfaction was not valid. Teacher support had no direct impact on learning ability satisfaction. The improvement of learning ability was achieved without the support of teachers [97,98]. Therefore, teacher support had an indirect impact by acting on other internal factors. For example, teacher support had a significant impact on learning motivation ($\beta = 0.359, p < 0.01$), which in turn affected the learning ability satisfaction (Figure 5). Teachers used scientific teaching methods to stimulate students’ learning motivation and mobilize positive performance to improve learning ability satisfaction. Teacher support had a direct and significant impact on learning self-efficacy ($\beta = 0.184, p < 0.01$), which had an impact on learning ability satisfaction by acting on learning self-efficacy. Teacher support had a significant impact on self-regulated learning ability ($\beta = 0.178, p < 0.01$), which affected the learning ability satisfaction through self-regulated learning ability. Under the conditions of the blended learning model, teacher support indirectly affected students’ learning ability satisfaction through internal factors such as students’ learning motivation, learning self-efficacy, self-regulated learning ability, etc. Therefore, the impact of external factors on learning ability satisfaction acted through multiple actions, and the interaction between internal and external factors affected learning ability satisfaction.

School education resources are the conditions and guarantees for promoting the smooth development of school education and teaching activities, and resource support is conducive to improving students’ learning abilities [99]. Resource support directly and significantly affected learning ability satisfaction ($\beta = 0.154, p < 0.01$) (Figure 5), which also indirectly affected learning ability satisfaction through other factors. Resource support had a direct and significant impact on learning motivation ($\beta = 0.266, p < 0.01$). The quality of school educational resources affected learning interest [100], which in turn affected students’ learning motivation. Resource support had a direct and significant impact on learning self-efficacy ($\beta = 0.359, p < 0.01$). Resource and environmental conditions affected learning input; learning self-efficacy was positively correlated with learning input [101], so resource support directly affected learning self-efficacy. Resource support had a significant impact on self-regulated learning ability ($\beta = 0.363, p < 0.01$). Online learning resources improved students’ online self-regulated learning ability [102]. Enhancing resource support through improving resource conditions played an important role in enhancing university students’ self-regulated learning ability [103]. Therefore, the resource support of blended learning directly affected learning ability satisfaction, and indirectly affected students’ learning ability satisfaction by acting on students’ learning motivation, learning self-efficacy, and self-regulated learning ability.

The analysis results indicated that the hypothetical relationship between peer support and learning ability satisfaction was not valid, so peer support had no direct impact on learning ability satisfaction. However, peer support had an indirect impact through its impact on other internal factors. Peer support had a direct and significant impact on learning motivation ($\beta = 0.215, p < 0.01$), peer support had a direct and significant impact on learning self-efficacy ($\beta = 0.132, p < 0.05$), and peer support had a significant impact on self-regulated learning ability ($\beta = 0.242, p < 0.01$) (Figure 5). Students’ internal learning motivation played a significant mediating role in terms of improving learning ability, and peer support played a significant moderating role [104]. Learning self-efficacy played a complete mediating role between peer support and learning persistence, and learning self-efficacy played a partial mediating role between teacher support and learning persistence [105]. Peer support helped students solve questions encountered in learning
and improve their ability to self-regulate learning [106]. Peers directly affected students’ learning motivation, learning self-efficacy, and self-regulated learning ability in the form of emotional support, information support, and instrumental support in the process of blended learning, which indirectly affected students’ learning ability satisfaction.

4.2. Action Process Analysis of Influencing Factors on Learning Ability Satisfaction

There was a lack of in-depth analysis of the effects of factors influencing learning ability satisfaction on various principal components. This study constructed a structural equation model to analyze the effect of the main influencing factors of learning satisfaction on learning ability satisfaction. The authors analyzed the effect and specific effect size of learning motivation, learning self-efficacy, self-regulated learning ability, teacher support, resource support, and peer support on learning ability satisfaction. The weight and path of teacher support in the influencing factor model were analyzed, and teacher support mainly had an indirect effect on learning ability satisfaction. The weight and path of resource support in the influencing factor model were analyzed, and resource support had both direct and indirect effects on learning ability satisfaction. The weight and path of peer support in the influencing factor model were analyzed, and peer support mainly had an indirect effect on learning ability satisfaction. The impact of resource support on learning ability satisfaction was multifaceted. The system quality and service quality of online education platforms directly and significantly affected the learning ability of university students, while the resource quality and functional quality of the platform had a significant indirect impact on the learning ability of university students [107]. In addition to internal factors of learning motivation, external factors of teacher support positively affected university students’ satisfaction with online learning [108]. Therefore, the analysis of factors affecting learning ability satisfaction needed to fully consider internal and external factors, and direct and indirect influences.

In order to further understand the influencing factors of learning ability satisfaction under the blended learning model, the researchers plan to take learners who adopt different learning methods as the research object in the next stage of research. The factor differences that affect self-regulated learning ability in traditional, online, and blended learning will be analyzed. The similarities and differences of different learning modes will be compared and analyzed to reveal the reasons for the differences.

4.3. Suggestions for Improving Learning Ability Satisfaction

There was an interaction between learners’ own factors, external factors, and behavior according to the perspective of social learning theory, which together determined individual development [109]. Therefore, it was necessary to comprehensively consider the effects of different influencing factors on learning ability satisfaction. The effect value of influencing factors from high to low was resource support (0.500), learning self-efficacy (0.494), self-regulated learning ability (0.327), teacher support (0.215), peer support (0.185), and learning motivation (0.184) (Figure 6). The resource support, learning self-efficacy, and self-regulated learning ability were given priority consideration in the future blended learning model.

Appropriate learning content was arranged to enhance learner satisfaction with learning abilities. Resource support in blended learning should fully consider learner analysis and learning content analysis [110], which integrates the two contents to design specific learning activities such as content arrangement, platform use, presentation mode, etc. The learning content met the learning needs of university students, and learning activities promoted the absorption of learning content. At the same time, the technology application perspective made full use of the platform functions to create online presence, so that learners’ teaching existence, social existence, and cognitive existence were coordinated and unified under the blended learning mode, which effectively met learners’ ability needs in the learning process.

A self-esteem experience needed to be created to guide students to actively engage in learning. Creating a situation to make students experience success made students
feel their ability under the blended learning mode. Early success experiences enhanced students’ confidence, which made students be more proactive in engaging in learning. In the process of blended learning, teachers made full use of the main function of the learning platform to dig out the specific performance of students’ outstanding ability in the learning process from different perspectives and dimensions through horizontal statistics and vertical comparison. Teachers helped students closely link their sense of self-worth, self-esteem experience, and learning process. This was conducive to preventing students from entering the self-defense state due to low self-efficacy.

Tools needed to be utilized for multiple stages of learning observation. In a blended learning environment, teachers relied on self-regulation tools to record and statistically analyze students’ learning process data such as learning time, place, and length, staged learning performance, interaction frequency and time length, and number of questions. Especially for students who had not completed the goal setting process, a review of the learning process was conducted. The learning status of students was investigated and evaluated, and timely feedback and suggestions were provided to guide students in self-monitoring, self-evaluation, and self-adjustment during the learning process. Many self-regulated learning tools have emerged in recent years, which provide important assistance in cultivating students’ self-regulation ability. For example, software such as the Go-study (v5.4.0), Meta Tutor (v1.0.20), and SRL (v1.0.0) have been used [103]. These tools were selected and utilized according to the characteristics of different students. In addition to teachers, schools aided with students’ self-regulated learning cultivation from the perspective of promoting the integration of teaching, learning, and evaluation.

Teaching design needs to be valued to achieve the transformation of original roles. The learning process of individual learners was not a closed system, and it was influenced by external conditions. The interaction and communication between teachers, students, and peers provided emotional support, information support, and instrumental support for university students’ learning. The most common learning form that helped to give play to the support of teachers, students, and peers was collaborative learning in the blended learning mode [111]. Teachers organized different ways of collaborative learning according to the characteristics of learning content to promote students to participate in learning more actively. This stabilized cognitive content and cognitive structure through interaction between different individuals. The interaction between individuals and other learners around appropriate collaborative learning tasks promoted individual cognitive development and social development, which showed more advanced behavior than independent work [112]. Collaborative learning not only promoted the interaction between learners and learning resources, but also satisfied students’ sense of belonging to themselves and the people and things around them [113]. When teachers organize related learning activities, they should actively transform their roles from “controllers” to “supporters”, “guides”, and “promoters”.

Motivation transformation needed to be promoted to enhance the driving force of individual development. Learning motivation had a direct impact on learning ability satisfaction [114]. The transition from external learning motivation to internal learning motivation was a long-term goal that runs through the entire learning process [115,116]. Any external force was transformed into an individual’s learning needs to become a driving force for learning. Attention should be paid to the transformation of external learning motivation into internal learning motivation in the process of education and teaching, and attention should be paid to maintaining the active state of students’ existing internal motivation. The expression and eye movement information of learners were captured by camera in the blended learning situation. Image processing technology and machine learning algorithms were used to conduct online learning real-time attention analysis, which was used as an aid to judge the activation state of learning motivation. Students were driven to engage in learning by creating question situations, creating cognitive conflicts, and stimulating students’ curiosity. The discussion area of the learning platform was set with post-class or periodic knowledge induction and summary tasks, which enabled...
students to review the learning process, deepen memory, enhance confidence, and maintain learning motivation.

5. Conclusions and Recommendations

In order to deeply explore the impact of various influencing factors on learning ability satisfaction under the blended learning model, data were collected via empirical research, and structural equation was used to verify and revise the theoretical hypothesis model. The main research conclusions are as follows:

(1) The external factor with the greatest effect of learning ability satisfaction was resource support. Resource support directly affected learning ability satisfaction, while resource support further affected learning ability satisfaction by acting on learning motivation, learning self-efficacy, and self-regulated learning ability. If students’ learning ability satisfaction is to be improved as soon as possible in a limited amount of time, teachers needed to dig deeply into blended learning resources.

(2) The internal factor with the greatest effect of learning ability satisfaction was learning self-efficacy. Learning self-efficacy had a direct impact on learning ability satisfaction, while learning self-efficacy indirectly affected learning ability satisfaction by acting on learning motivation. Therefore, teaching activities related to improving learning ability satisfaction need be designed to improve students’ self-efficacy.

(3) Compared with other external influencing factors, teacher support and peer support played an indirect role in university students’ learning ability satisfaction, which mainly affected learning ability satisfaction by influencing learning motivation, learning self-efficacy, and self-regulated learning ability.

(4) Internal influencing factors had a greater impact on the university students’ learning ability satisfaction than external factors. It was of great significance to optimize and improve students’ learning motivation, learning self-efficacy, and self-regulated learning ability in the process of blended learning.

(5) When faced with low satisfaction with learning ability in teaching practice, teachers used their limited energy to improve the factors that had a significant impact on learning ability satisfaction.

Supplementary Materials: The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/su151612454/s1, Table S1: Dimensional division of learning ability satisfaction and influencing factors; Table S2: Questionnaire questions corresponding to potential variables; Table S3: The questions to be solved in in Figures 2–4; Table S4: Standardized regression weights in Figure 3; Table S5: Standardized regression weights in Figure 4.


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