Multivariate Research on Satisfaction Influencing Factors of Flipped Classroom Teaching Mode

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Abstract. Based on the theory of Technology Acceptance Model (TAM) and American Customer Satisfaction Scale (ACSL), this study selects 130 students majoring in preschool education, Chinese education and primary education in a higher vocational college in China as the research sample from the perspective of technology and consumers to carry out college English flipped classroom teaching based on SPOC (Small Private Online Course) mobile interactive learning platform. Through descriptive statistical analysis, factor regression analysis and the influence mechanism of common factors, this study aims to investigate and analyze students' satisfaction of flipped classroom on 30 items. The results show that learners' satisfaction cognition of flipped classroom is deeply influenced by three common factors: Learners' expectation, cognitive quality and learning acceptance. Furthermore, the findings indicate that high quality activity design is the key factor for the success of flipped classroom, learners' expectation of flipped activities is the internal driving force, and learners' acceptance of flipped classroom teaching mode is the main factor.

Keywords. Flipped Classroom, Satisfaction, Acceptance, College English, SPOC, Influence Factor

1. Introduction

With the rapid development of cloud computing, big data, Internet of things, AI, 5G and other modern information technologies, Internet plus education has become a new normal for future education development. "The Outline of the National Medium- and Long-term Education Reform and Development Plan (2010-2020)"[1] points out that it is necessary to take reform and innovation as a strong driving force for education development and improve quality as the core task of education and teaching reform and development. To develop education, we should fundamentally rely on reform and reform the teaching contents, modes, methods and means. "The Ten-Year Development Plan for Educational Informatization (2011-2020)" issued by the Ministry of education in 2012

further emphasizes the necessity to give full play to the unique advantages of modern information technologies and explore the establishment of a new learner centered teaching model. It is particularly vital to encourage students to use information means to study actively, independently and cooperatively, cultivate students' good habits of using information technologies, develop their interests and specialties, and improve the quality of learning.

In recent years, flipped classroom is triggering a new wave of educational model reform, and has become one of the focus topics in the field of higher education and educational theory [2]. American online education media e-campus news network listed flipped classroom as one of the top ten educational technology events in 2011 and Professor Daphne Koller of Stanford University believes that the new form of teaching supported by flipped classroom technology may be a major change after the classroom teaching mode since the European Renaissance [3]. Furthermore, flipped classroom was rated as a major technological change affecting classroom teaching in 2011 by the global mail of Canada [4].

In China, some universities and scientific research institutions have also implemented the research on the localization of flipped classroom teaching mode and the practical exploration of flipped classroom teaching process, evaluation mechanism, teaching strategy and activity design. However, there is still a lack of empirical research on learner satisfaction survey and evaluation and impact factor analysis in China. The factor analysis of satisfaction is an important reference index for learners' formative evaluation. In terms of College English education, formative assessment based on satisfaction factor analysis helps students acquire language knowledge, improve language skills and achieve the goal of in-depth learning. It not only has the function of diagnosis promotion, feedback and incentive, but also has the function of reflection and summary [5]. This study takes college English teaching as an example, chooses SPOC mobile interactive platform as the research platform, designs a questionnaire based on TAM and ACSI, and implements relevant statistical analysis and empirical research, which not only provides theoretical and data reference for the implementation of flipped classroom in the field of Higher Vocational Education in China, but also expands the research direction of flipped classroom.

2. Literature Review

With the gradual deepening and wide application of flipped classroom teaching practice, the research related to flipped classroom is also increasing, and a series of research results have been produced. These achievements involve different disciplines such as economics, mathematics and mechanical engineering, and the subjects are mainly natural and engineering disciplines, while humanities and social sciences are relatively few. Their main topics focus on the teaching design and implementation strategy of flipped classroom, the concept, connotation and main characteristics of flipped classroom, and the comparative research between flipped classroom and traditional classroom. After years of flipped classroom teaching practice, the founders Jonathan Bergmann and Aaron Sams published a monograph, summarized the relevant theories of flipped classroom and shared their research and practical experience. Marco Ronchetti [6] focuses on exploring the methods, strategies and effects of online video instead of traditional teaching practice. Jeremy F. Strayer [7], an American educational technology expert, confirmed that flipped classroom has a significant positive impact on the cultivation of learners'

collaborative ability and innovative ability through a comparative study with traditional classroom. Moreover, Lage and Platt of the University of Miami introduced in detail their ideas, methods and effects of applying and implementing flipped classroom in microeconomics course [8]. After years of flipped classroom teaching experiments, Professor Robert Talbert of Franklin college in the United States summarized the public recognized flipped classroom implementation structure model of two stages in pre class and in class [9] (See Figure 1.)
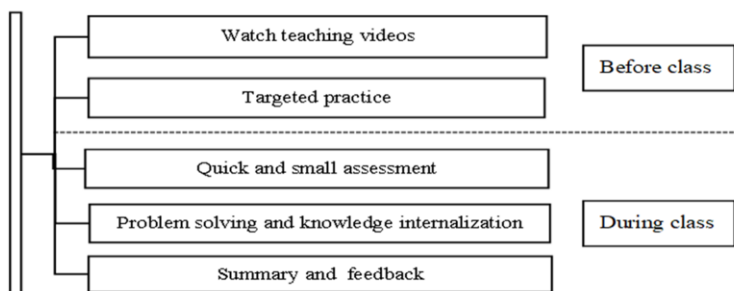

Figure 1. Robert Talbert flipped classroom implementation structure diagram

Although the research on flipped classroom in China started late, it has gradually attracted the attention of higher education circles and become one of the research hotspots. It is mainly reflected in the flipped classroom teaching mode, strategy, evaluation, effect and other aspects. Based on the analysis of the connotation and advantages of flipped classroom teaching mode, Xue and Zheng constructed a SPOC flipped classroom teaching mode with three platforms, three stages, three steps and three links and elaborated on the specific content of the model with three stages as the main line. Then, based on the model, the practice of flipped classroom of computer basic courses is carried out. on the basis of the analysis of the difficulties faced by college English teaching in the information age [10], Dou and Wen put forward a college English flipped classroom teaching model based on e-learning platform [11]. The research shows that this model has more advantages than the traditional classroom teaching model in stimulating students' interest in learning, enhancing the communication and interaction between instructors and students and deepening knowledge understanding. Lv and Wang explore the college English classroom teaching model based on SPOC + digital teaching resource platform by using the methods of comparative experiment, quantitative analysis, questionnaire survey and instructor-student interview, the result of which shows that the teaching experiment plays a positive role in improving learners' comprehensive English application ability and learning efficiency, avoids a lot of repetitive work of instructors, and is conducive to the implementation of innovative teaching [12]. Guided by the concept of flipped classroom, Zhang and Tao attempt to create some "flipped" elements in the SPOC teaching environment by taking advantage of high-quality network resources and some advantages of traditional classroom teaching.

Furthermore, With the help of a variety of learning platforms and mobile learning tools, many other researchers such as [13],[14],[15],[16],[17],[18],[19],[20],[21], [22],[23],[24] explore and build a flipped classroom teaching model suitable for different subject teaching and different learners' learning. These studies also show the advantages of flipped classroom teaching model from different dimensions. For instance, these models can effectively improve the quality of classroom teaching, cultivate learners' autonomous learning ability, improve metacognitive level, reduce cognitive load,

improve subject learning performance, enhance learners' satisfaction with the course and so forth.

Macroscopically, Zhang and Meng analyzed and demonstrated the value, limit and symbiosis of learning guidance case teaching and flipped classroom teaching [25]. Zhang analyzed the key factors such as the design of teaching video, the construction of personalized collaborative learning environment and the design of classroom activities [26]. Flipped classroom is an effective way to promote the deep integration of information technology and education [27]. Wang and Wu pointed out that under the flipped classroom mode, students' subjective norms and subjective attitudes directly affect their learning behavior [28]. Learning tasks, learning environment, learning evaluation and teaching management have a significant positive impact on students' subjective norms. Video learning resources, teaching activity design and instructors' classroom teaching have a significant positive impact on students' subjective attitudes and information technology support is no longer the main factor affecting students' learning behavior in flipped classroom. Zhu and Zhu; Wei; Huang and Zheng; and Gao discussed and explicated the strategies for the effective implementation of flipped classroom, including establishing new teaching ideas, constantly improving the ability to implement flipped classroom, focusing on cultivating students' learning skills, changing instructors' roles, making high-quality pre-class videos, and carrying out various forms of classroom activities [29][30][31][32]. Moreover, Liu et al. conducted systematic evaluation and meta-analysis on the effectiveness of SPOC flipped classroom teaching [33]. The results showed that the examination scores, knowledge understanding ability, knowledge application ability, self-study ability, self-management ability and learning motivation of SPOC flipped classroom are higher than those of traditional classroom.

Through the literature review of existing domestic research, we find that the researches on flipped classroom in China are still lack of researches on the whole and mutual influence relationship, and the lack of comparative researches between domestic and foreign countries, which limits the exploration of flipped classroom in higher education in China in the analysis of influencing factors. Based on the theory and empirical researches of flipped classroom at home and abroad, this study designs the satisfaction questionnaire of flipped classroom in college English in China, and seeks its influencing factors, so as to provide theoretical basis and practical support for building a flipped classroom model suitable for college English teaching environment in China.

3. Implication of SPOC

SPOC (small private online course) is a small-scale private online course formed by setting participation access conditions (mainly for school students), which is mainly composed of micro videos, real-time online practice, online interactive discussions, various tests and other elements. Essentially, it is a blended learning mode of MOOC localization, which overcomes the problem that MOOC cannot match the teaching objects, curriculum objectives, difficulties and students' existing knowledge accumulation of existing courses [34]. It has the characteristics of directivity, limitation, flexibility, goal orientation and so on. Its importance is that online learning has jumped out of the stage of copying classroom courses, and is trying to create some more flexible and effective ways to enhance instructors' guiding role and students' mastery of knowledge and participation [35][36].

4. Definition of Flipped Classroom

Researchers at home and abroad have different entry points in defining the concept of the flipped classroom. The concept of flipped classroom was first put forward by two instructors of Woodland Park High School in Colorado. Its basic idea is to turn the traditional learning process upside down, so that learners can complete independent learning for knowledge points and concepts in extracurricular time, and the classroom becomes a place for interaction between instructors and students, which is mainly used to answer doubts, report and discuss, so as to achieve better teaching results [37]. Flipped classroom refers to a new teaching mode that changes the roles of instructors and students in traditional teaching and re plans the use of classroom time through the reversal of knowledge transfer and knowledge internalization. It changes the traditional "teaching centered" and adopts "student-centered" personalized teaching [38]. Brian Gonzalez, Intel's director of global education, points out that the emergence of the flipped classrooms is an example of exploring learner' learning space, which provides learners with a freer learning space. He argues that knowledge learning in the flipped classroom takes place outside the classroom, and learners can learn new knowledge according to their own learning habits and methods, and improve their learning ability. As a matter of fact, Brian points out the differences between the traditional classroom and the flipped classroom in the process of teaching implementation and learners' learning experience. Zhong, song and Jiao argue that the so-called flipped classroom is that instructors raise questions in an information-based environment and instructors and students can complete the teaching and learning activities in the form of video, inquiry and other interactive teaching resources for learners [39].

Furthermore, Jin is the first place to define the flipped classroom in China. He claims that the flipped classroom means turning over the traditional teaching mode that instructors teach in the classroom during the day and learners go home at night to do homework, and constructing learners to absorb and internalize knowledge in the classroom during the day, and to complete the learning of new knowledge after class [40]. Zhong who is working in the Information Technology Center of Tsinghua University and other researchers claim that the so-called flipped classroom is a kind of teaching and learning activity mode in which instructors provide learners with teaching videos and carry out teaching activities in the context of information technology, learners watch and learn these videos and other learning resources before class, and then instructors and learners complete homework answering, collaborative inquiry and interactive communication together in the classroom [41]. It can be seen that experts and scholars at home and abroad have different definitions of the flipped classroom according to their own understanding and explanation, but generally speaking, the flipped classroom should include at least four aspects: the development and production of curriculum video, self-study and mutual learning before class, classroom absorption and internalization, and summary of report and discussion. After summarizing the theoretical definition of the flipped classroom, we believe that the flipped classroom is a brand-new teaching mode based on network information technology. That is to say, instructors provide micro courses and other related learning resources for students to study autonomously or explore knowledge cooperatively before class. Students in class report and perform what they have learned or discuss and solve problems that cannot be solved with the help of instructors so as to further absorb and internalize the knowledge learned [42].

5. Construction of Flipped Classroom Teaching Mode Based on SPOC

5.1. Prototype Teaching Mode Based on SPOC

During 2009-2012, students' homework for holiday in Changle No.1 Middle School couldn't be checked timely by instructors. Aiming at this problem, the school carried out such a series of network learning mode as the QQ group holiday work instruction, the network learning platform for autonomous learning, teaching micro video explanations and so on. What's more, they introduced this network learning mode to teaching practices. Thus, the embryonic form of flipped classroom came into being. In October 2013, Changle No.1 Middle School put forward their specific flipped classroom teaching mode which is called "Two-stage, Four-step and Ten-segment".

The "Two-stage" means the self-study and questioning stage and practice and presentation stage. The "Four-step" means class hour planning, micro class production, case design and micro class recording. "Ten-segment" includes target setting, autonomous learning, watching micro classes, interactive learning, online learning, difficulty solving, practice, presentation, cooperative improvement and evaluation feedback [43].

On the basis of the flipped classroom mode of Changle No.1 middle school, this research effectively takes advantage of SPOC mobile interactive learning platform to implement the design of integrated learning activities, realize the organic integration of various learning activities, and then achieve the goal of in-depth learning. This teaching mode is more conducive to cultivating students' autonomous learning ability and cooperative inquiry ability, and shaping students' critical, creative and speculative thinking. Based on the classic flipped classroom teaching mode at home and abroad and combined with the teaching practice, this paper constructs a blended flipped classroom teaching mode integrating knowledge extraction and micro class production before class, report display and evaluation feedback during class, and consolidation, improvement, adjustment and correction after class. (See Figure 2.).
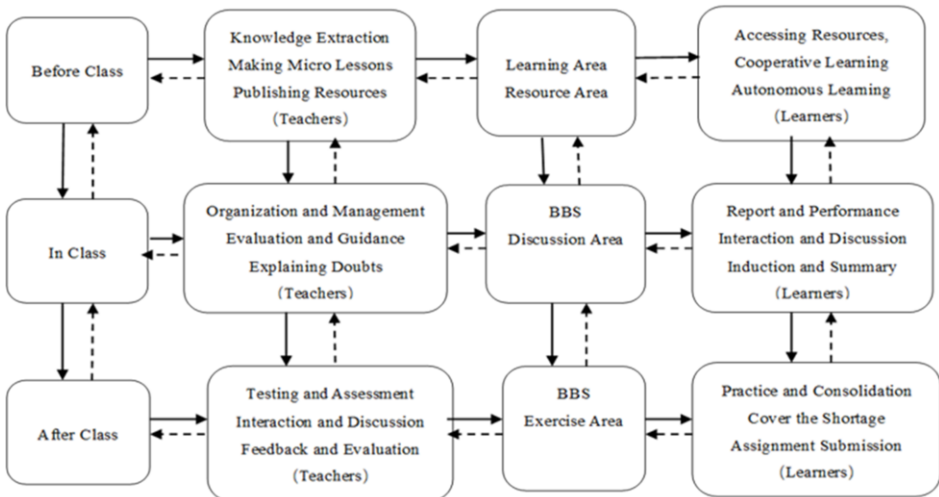

Figure 2. College English flipped classroom teaching model based on SPOC

5.1.1. Knowledge Extraction and Micro-class Production Stage before Class

During this stage, the core task of instructors is to design the teaching content as a whole, to determine the teaching objectives of each part of the teaching content, to screen out the knowledge points that need to be mastered and the difficulties that need to be solved urgently, to put forward the inspiration and guidance issues that drive the teaching, and to design online learning tasks and closed exercises. Based on this, instructors need to write a detailed micro-course design idea, list micro-course production framework and procedures, collect relevant teaching resources and materials, use relevant software to produce high-quality micro-course videos, and publish it to the SPOC learning sharing platform based on Superstar Learning, and inform learners through the platform notification function.

5.1.2. Autonomous Learning and Collaborative Inquiry Stage before Class

After receiving the learning instructions and assignments from instructors through the platform notification release window, learners use mobile phones to enter the learning area anytime and anywhere for pre-class learning according to their learning habits, learning methods and time arrangement, complete the initial absorption and internalization of knowledge, and test their understanding and mastery of knowledge in the ability testing area. In this process, if learners encounter deviations in understanding or problems that are difficult to solve in learning, they can always consult instructors and classmates through the platform chat window, or go to the discussion area for an interactive discussion between instructors and learners and among learners. Finally, learners can complete further absorption and internalization of knowledge through autonomous or collaborative inquiry. Sure enough, to ensure the quality and smooth progress of the learning task in this stage, it is imperative for instructors to timely and efficiently supervise, manage and instruct the learning process of learners.

5.1.3. Report, Presentation, Evaluation and Feedback Stage during Class

After autonomous and collaborative inquiry before class, learners completed the initial absorption and internalization of knowledge and construction, with learning results and learning doubts came to the classroom to report and present or seek the help of instructors. The performance of learners' classroom reports can be presented in groups, situational dialogues, role-play, keynote speeches, drama performances, debates and other forms according to the learning content, in the process of which instructors should play a good role as organizers, controllers and evaluators of activities, inspire and guide learners to summarize learning activities, and further promote learners' absorption and internalization of knowledge.

5.1.4. Consolidation, Improvement, Adjustment and Correction Stage after Class

After two stages of pre-class autonomous and collaborative inquiry and in-class presentation, learners' learning of relevant knowledge has changed from the understanding level to the application level, and the absorption and internalization of knowledge has been completed as well. The main task of this stage is to further strengthen and consolidate the absorption and internalization of knowledge and to systematize knowledge, at which instructors design and compile knowledge and competence test questions and assignments, and provide them to learners through the SPOC teaching platform (See Figure 2).

6. Experimental Design

6.1. Experimental Purpose

Based on the International Technology Acceptance Mode (TAM) and the American Consumer Satisfaction Scale (ACSI), the study designs a questionnaire on the satisfaction of the flipped classroom teaching mode, which combines the domestic and foreign literatures on the flipped classroom teaching mode, and takes full account of the current situation and objective facts of English learning of higher vocational learners. This paper explores the reliability, validity and correlation of each measurement variable through factor analysis with relevant software, and provides theoretical and practical data support for college English teaching in higher vocational colleges. In addition, the study mainly chooses information publishing and mobile learning platform which is suitable for college English flipped classroom teaching in higher vocational colleges in China as an experimental platform.

6.2. Experimental Methods

Considering the high expectation of learners in the technical level and subjective initiative of flipped classroom teaching mode, the design dimension and project setting of the questionnaire are mainly based on the theoretical mode, the existing scale, the relevant important literatures and the practical aspects of higher vocational teaching. In terms of theoretical model, at present, most of the research on learner satisfaction in the field of higher education is revised based on ACSI, and more online education also widely draws lessons from TAM model. This study compares the two models and refines the observation variables of teaching quality in ACSI. In terms of scale, because the performance evaluation of flipped classroom in foreign language teaching is a dynamic process, special attention is paid to the improvement of learners' learning initiative and consciousness and the establishment and maintenance of teaching environment. In teaching evaluation, it is natural to pay more attention to formative evaluation and weaken summative evaluation. Therefore, this study focuses on online learning certification standard scale. In terms of references, since there is no research on the influencing factors of satisfaction of flipped classroom teaching model and the construction of theoretical model in China, this study refers to the research results of Jeremy F. Strayer and other foreign scholars. Based on this, the research team selected learner expectation, learner acceptance and learner satisfaction as observation variables, among which learner acceptance includes five dimensions:

- Operability and practicability of SPOC teaching platform.

- Usability and effectiveness of online courses.

- Interaction of face-to-face class.

The questionnaire in the study includes two parts: the main part of the questionnaire and the description of personal information. The main part is composed of 35 questions designed from different perspectives of the flipped classroom teaching mode. In order to ensure the reliability and validity of the questionnaire, a reverse item is added to each question. The survey scale is indicated from 1 to 5, which means totally disagree,

disagree, neutral, agree and fully agree respectively, and all the statistical data are analyzed by SPSS22.0 analysis software.

6.3 Experimental Participants

The participants of the study are 130 students majoring in pre-school education, Chinese education and primary school education in the first year of Baoji Vocational and Technical College, all the participants were admitted through the National College Entrance Examination, 120 of whom are girls and 10 of whom are boys aged between 18 and 20 years old because the students studying education in China are almost girls, and the teaching materials were selected from the New Horizon English Reading and Writing Course (Third Edition), edited by professor Zheng Shu-tang. All participants in the experiment accepted a one-year flipped classroom teaching practice, including 72 hours of online course learning tasks. After the experiment, a questionnaire survey was conducted among the participants. The research team sent out 130 questionnaires and received 125 questionnaires. After screening, 5 invalid questionnaires were removed. The actual valid questionnaires are 120 and the validity rate of the questionnaires is 96%.

7. Discussion and Analysis of Research Results

7.1. Validity Analysis

The principal component method in statistical analysis is used to analyze and measure the collected data, which can test the validity of the collected data well. Meanwhile, the relationship between statistical variables can be observed effectively. We use factor analysis to analyze the questionnaire data, and use KMO and Bartlett test to sample the data according to the eigenvalue greater than 1. According to KMO statistical standard, when KMO > 0.9, factor analysis can be carried out ideally. We randomly selected 30 questions from 35 questions and selected 7 factors for KMO test. The test value was .804, which indicated that the correlation between the observed variables was not very different. In addition, the approximate Chi-square Value of Bartlett Sphere Test is 1543.754, and the Sig. is 0.002, which is less than the minimum requirement of 0.05. It can be seen that the zero hypothesis of Bartlett Sphere Test is not valid and the values of each variable are correlated. Therefore, the sample is more suitable for factor analysis (See Table 1).

Table 1. KMO and Bartlett Test Statistics

Kaiser-Meyer-Olkin Measure		. 804
Bartlet Sphere Test	Approximate Chi-square Value	1543.754
	df	356
	Sig.	. 002

7.2. Reliability Test

For the purpose of testing learners' satisfaction with the flipped classroom teaching mode, reliability analysis of the factors involved in the question is needed. Cronbach's Alpha coefficient is a commonly used method for reliability test, which is generally believed that when a > 0.6, the reliability of statistical analysis data is higher. The overall alpha reliability coefficient of the questionnaire is 0.85, which indicates that the reliability of the questionnaire is very high. The results of reliability analysis show that Cronbach's Alpha coefficient are between 0.65 and 0.761, which fully shows that the questionnaire items have high reliability and the consistency among the factors is good. In the meantime, it also shows that the three common factors selected in the study can better measure learners' satisfaction with the college English flipped classroom teaching mode (See Table 2).

Table 2. Reliability Analysis Statistics

Item		Cronbach's Alpha
Learner Expectation		.745
Acceptance Dimension	Operability of Learning Platform	.761
	Practicality of Learning Platform	.760
	Usability of Online Courses	.758
	Practicality of Online Classroom	.756
	Interaction in Face-to-face Class	.650
Learner Satisfaction		.759
Overall Reliability of the Project		.850

7.3. Regression Factor Analysis

In order to observe the satisfaction of each factor to the teaching of the flipped classroom teaching mode and provide a powerful data reference for future teaching reform, we selected three common factors as independent variables to continue to observe the overall satisfaction of the flipped classroom teaching mode as dependent variables, and made a regression equation analysis. It can be seen from the scatter plot (See Figure 3.) that the standardized residuals mainly fall between (-2, 2), which indicates that the learners' overall satisfaction with the teaching mode of College English flipped classroom in higher vocational colleges is higher and the fitting degree is better.
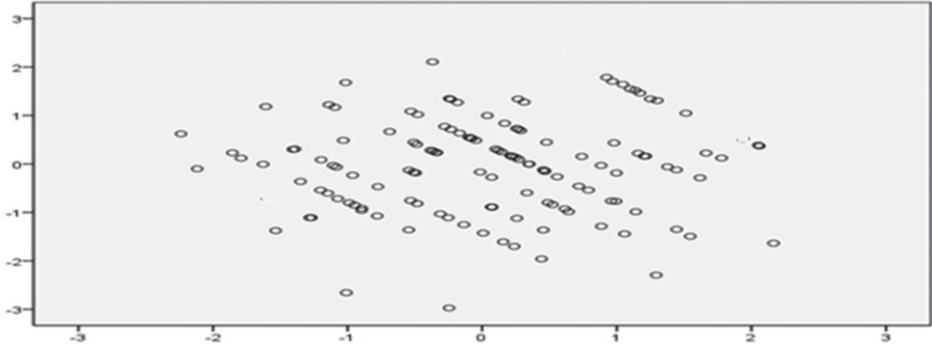
Figure 3. Scatter Plot of Regression Equation Analysis

The research team conducted T-test analysis on learner expectation, learner acceptance and learner satisfaction. The values of Sig. are .041, .045 and .034 respectively have significant differences (See Table 3). It is clear that the basic relationship based on SPOC among the above three variables can be seen, which also shows that learners' expectation, acceptance and satisfaction of the flipped classroom teaching mode have reached the experimental presupposition.

7.3.1. Course Quality Is the Key Factor Affecting the Effective Implementation of the Flipped Classroom Teaching Mode.

The implementation of the whole teaching process of the flipped classroom teaching mode cannot be separated from the extensive and in-depth use of information technology, which requires us to put the concept of education informatization throughout the whole process of education and teaching. The Ten-Year Development Plan for Informatization of the Ministry of Education (2011-2020) also points out that it is a strategic choice for the development of education in China to promote the modernization of education-by-education informatization. It is of great significance for improving the quality of education, promoting educational equity, building a learning society and a powerful human resource country through building an information-based education system covering all kinds of schools in urban and rural areas, accelerating the popularization and sharing of high-quality educational resources, promoting the deep integration of information technology and education and teaching, and realizing the all-round innovation of educational ideas, concepts, methods and means. The flipped classroom teaching mode is to make full use of the advantages of communication and interaction of information technology platform, and combine high-quality online curriculum resources to comprehensively guarantee the improvement of teaching quality. In this sense, the flipped classroom learning platform should create such a teaching and learning environment as a user-friendly interface, convenient communication, smooth interaction, rich contents, real-time monitoring, multi-evaluation, timely feedback and scientific data generation functions [44]. Meanwhile, it should ensure the mobility of the learning platform and give full play to the advantages of mobile learning. Moreover, the online curriculum content setting should strive to be more hierarchical, operational and promotional, which is more conducive to in-depth learning. In other words, the curriculum setting should originate from the curriculum and go beyond the curriculum. Video resources for micro-courses should be made according to the key points and

difficulties of courses. The relevant curriculum resources should include not only the planned contents, but also the various examinations concerned by learners and the background information related to the courses. That is to say, online course resources should have depth, breadth and density [45].

7.3.2. Learners' Expectation Is the Driving Factor That Influences the Effective Implementation of the Flipped Classroom Teaching Mode.

According to ACSI theory, there are three observational variables that determine audience expectation: customer expectation, reliability expectation and overall quality expectation. Therefore, before preparing to carry out the flipped classroom teaching experiment for learners, we should make full prevenient conception and design, fully investigate learners' learning expectation goals, and finally accurately locate their specific expectation scope through analysis. Through the questionnaire survey, it is found that the learners' expectations of College English learning in higher vocational colleges are pluralistic [46]. On the surface, they expect to improve their listening, speaking, reading, writing and translating abilities comprehensively in their study, but in reality, they hope to pass all kinds of examinations smoothly including PRETCO (Practical English Test for Colleges) and test for upgrading from junior college to university in their hearts. In view of the future career intentions of higher vocational learners, it can be found that the widespread expectation of College English learners should be related to their professional learning and future career development. This requires us to fully implement the learner-centered teaching concept in teaching. In practical teaching, we should carefully explore and discuss the curriculum setting, the teaching materials screening, the selection of resources, the presentation of content, the assessment and evaluation, and truly embody the concept of public English learning serving the profession in teaching (See Table 3.).

Table 3. Statistics of Learners' Expectation for the Three Dimensions of College English Flipped Classroom

Observed Variables	Mean	Std. Deviation	T Value	Sig.
Learners' Expectation	3.47	1.15	-2.091	.041
Learners' Acceptance	3.38	1.25	-2.286	.045
Learners' Satisfaction	3.42	1.10	-2.140	.034

7.3.3. The Learners' Acceptance Is the Main Factor for the Effective Implementation of the Flipped Classroom Teaching Mode.

The results show that learners generally agree with and accept the College English flipped classroom teaching mode. Most learners are not only willing to accept the flipped classroom teaching mode, but also feel that the implementation of the flipped classroom teaching mode can improve their English ability, and they are satisfied with the flipped classroom teaching mode (See Table 3). The reasons are as follows: Firstly, we should change the rigid traditional classroom teaching mode to meet the different individual learning needs of each learner. Secondly, the flipped classroom truly embodies the

learner-centered teaching concept, learners' learning is more autonomous, and learning methods are more intuitive and repeatable. Thirdly, the flipped classroom can better combine pre-class autonomous learning with in-class presentation, and can comprehensively improve learners' comprehensive language ability [48]. Similarly, under the flipped classroom mode, learners can carry out pre-class learning at their own pace, which can better achieve and reflect the goal of teaching learners in accordance with their aptitude.

8. Conclusion

Based on SPOC teaching platform, this study explores the effectiveness of flipped classroom teaching mode from three dimensions: Learners' expectations, the acceptance of flipped classroom teaching mode and the satisfaction of teaching effect. By means of the methods of validity, reliability and regression factor analysis to collect, sort out, summarize and analyze the relevant experimental data, the research results through a one-year experimental study fully prove the correctness of the three research hypotheses, that is, vocational college students are extremely dissatisfied with the traditional English classroom teaching, and the flipped classroom teaching mode based on SPOC is full of expectations. Through the flipped classroom teaching of one year in the classroom teaching practice, students are more satisfied with the teaching effectiveness of this teaching mode, and their academic performance has increased significantly compared with the previous one. To this end, we conclude that if we want to effectively implement the flipped classroom teaching mode, achievement of high course quality is a key factor, high expectation of learners is an important driving force and the learners' acceptance towards the flipped classroom teaching mode is a main factor.

Undoubtedly, the flipped classroom is a new teaching mode, which develops rapidly in foreign countries and gradually drives to maturity. But in the field of education in China, it is still in the stage of exploration and trial [47]. Many colleagues in the educational circles have carried out various forms of educational and teaching experiments, which prove that the flipped classroom teaching mode reflects its due value in many aspects. For example, it can effectively improve learning performance, comprehensively improve learners' autonomous and collaborative inquiry ability, effectively meet learners' individual learning needs, realize the transformation of instructors and learners' roles and status, and help to cultivate learners' comprehensive learning ability, all of which are in line with the goals and requirements of education and teaching reform. However, due to the influence of traditional education and teaching ideas and the limitations of teaching software, hardware and technology, there are many difficulties in developing flipped classroom teaching mode in some areas of China. Definitely, if we want to further develop flipped classroom teaching mode in China, we must attach great importance to the following aspects:

8.1. Breaking through the Shackles of Information Technology Barriers

The effective development of the flipped classroom cannot be separated from the support of information technology. We should make every effort to develop and build various web-based learning platforms to provide learners with a good learning environment and high-quality web-based curriculum resources. However, the reality is unsatisfactory. Many instructors do not have the ability of information technology and cannot guarantee

the quality of the design, production and development of network curriculum resources. Moreover, many instructors are single-handed and do not build up a teaching team and community, which increases the burden of teaching for the majority of instructors. Therefore, when designing, building, developing and producing micro-video resources, it is necessary to extract knowledge points in advance [48]. Micro-class resources should be elaborately produced by aiming at teaching objectives, identifying key points, breaking through difficulties, and reflecting highlights. Micro-classes should be presented in the form of having the sense of humor and interest in order to attract learners' attention and stimulate learners' interest in learning. It is necessary to achieve the purpose of the practice of teaching activities, the case-based teaching methods and the sharing of teaching resources. At the same time, resource alliance should be established to lighten instructors' teaching burden.

8.2. Strengthening the Supervision and Guidance of the Pre-class Learning Process

The flipped classroom teaching has realized the transformation of teaching methods, instructors' and learners' roles and teaching time [49]. The absorption and internalization of knowledge are completed ahead of schedule. Learners can initially absorb and internalize knowledge through autonomous learning before class, which is the key stage to ensure the quality of learning. If the pre-class knowledge learning and initial absorption internalization cannot be completed in advance, it is difficult to ensure the effective implementation of presentation and in-depth discussion in class [50].Therefore, at this stage, instructors must strengthen the supervision and management of learners and learning guidance, pay close attention to and interact with learners through the discussion area and notification area of SPOC learning platform to help learners complete the relevant learning tasks.

8.3. Keeping in Mind the Blindness of Following the Trend in the Choice of Teaching Modes

The emergence of each teaching mode has its own characteristics and advantages, but it also has its own limitations, which involves exploring the subject adaptability of the flipped classroom teaching mode. According to the relevant researches at home and abroad, it can be seen that the flipped classroom can be applied to the teaching of natural science courses such as physics, chemistry, biology, mathematics and social science courses such as language and art. It makes great difference to exploring some of the basic problems involved in these courses, understanding some basic concepts, guiding learning methods, memorizing knowledge and analyzing contents. Learners can basically master the knowledge system and framework by autonomous learning of micro-videos and other online courses before class. Extensive learning of curriculum can be accomplished through interaction and cooperation between instructors and learners [51]. However, for those courses with strong logicality, complicated reasoning process and strong specialty, it is necessary for us to seriously explore and think about how to carry out the flipped classroom teaching.

8.4. Extending the Scope of Time and Space of the Research and Increasing the Diversity of the Research

Due to the limitation of research conditions, the research sample is limited, and only 130 learners of different majors from the same college are selected to participate in the experiment. Furthermore, some learners have different personality needs because of their insufficient understanding of the flipped classroom, which requires us to further increase the sampling of the experimental research and expand the experimental group in future experiments. It is vital for us not only to consider the depth of the experiment, but also the breadth of the experiment, and try our best to meet the main needs of learners so as to achieve the stability and reliability of the research results.

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