# A Study on Behavioral Intention in SPOC Blended Teaching Mode Based on the TAM Model

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**Abstract:** Traditional teaching models are gradually changing with the development of science and technology, and online teaching is becoming more prevalent, giving rise to the SPOC blended teaching mode. The SPOC blended teaching mode efficiently utilizes MOOC online course resources, combining with traditional teaching to showcase the advantages of online education while mitigating some of the drawbacks of offline instruction. This study, grounded in the Technology Acceptance Model (TAM), conducts a questionnaire survey among students participating in the "Health Management" SPOC blended teaching mode course. It analyzes the impact of variables such as clarity of learning content, perceived usefulness, and perceived ease of use on the behavioral intention of SPOC blended teaching mode. By constructing a regression model for the behavioral intention of the SPOC blended teaching mode, it explores university students' attitudes towards and willingness to use this teaching mode in the future. The research reveals that the clarity of learning content, as well as individuals' perceived usefulness and perceived ease of use, to some extent, determine their behavioral intention towards the SPOC blended teaching mode. However, willingness to use does not have a positive effect. Clarity of learning content influences perceived ease of use, and both clarity of learning content and perceived ease of use influence perceived usefulness to some extent. Perceived usefulness influences willingness to use, but clarity of learning content and perceived ease of use do not impact willingness to use.

**Keywords:** TAM, SPOC, Blended teaching mode, Behavioral intention

## 1 Introduction

The rapid development of Internet technology has greatly facilitated the integration of education and information technology. As China continues to advance its educational informatization construction, deeply incorporating internet technology into higher education is an inevitable trend in line with the development of the times. Many higher education institutions are undergoing a modern information technology networked and globalized teaching revolution. The ability for self-directed learning and a lifelong learning mindset has become a higher requirement for talent development in today's society. The emergence of a new blended teaching model based on the internet is not only a novel educational concept but also a future trend in educational development. With the rapid development and application of network technology, countries worldwide place high importance on online education. Various countries have established numerous high-quality open online courses on different platforms. In China,

platforms like China University MOOC and XuetangX have been created, offering thousands of national-level quality open courses. Many schools are implementing SPOC (Small Private Online Course) teaching practices based on these courses.

As China accelerates its educational informatization process, the integration of MOOCs with offline classrooms has garnered widespread attention. The SPOC blended teaching model complements the strengths of online and offline teaching, reconstructing and optimizing traditional education models, thereby enhancing the quality and effectiveness of higher education courses. The current focus is on how to apply theories to blended teaching reform, optimize online teaching videos and lesson plans, and increase the acceptance intention of the SPOC blended teaching model by combining individual learning situations. SPOC, with its efficient utilization of quality MOOC course resources to serve traditional teaching, has gained significant attention in higher education teaching practices[1]. While existing research has explored various external factors influencing SPOC learning performance, there has been limited focus on the intrinsic psychological needs of SPOC learners[2].

## 2 Theoretical Framework and Conceptual Definitions

### 2.1 TAM Model

American scholar Fishbein proposed that individuals are rational and, before initiating behavior, they weigh information obtained to generate behavioral intentions, ultimately leading to actual behavior. Analyzing factors influencing individual behavioral intentions aids in predicting individual behavior[3]. The Technology Acceptance Model (TAM)[4], introduced by American scholar Davis in 1989, is based on the Theory of Reasoned Action (TRA), which asserts that individual behavior is influenced by behavioral intentions determined by individual attitudes and subjective norms. TAM also incorporates relevant theories such as self-efficacy theory and expectancy theory, making it well-suited for studying technology acceptance issues. Unlike the Theory of Reasoned Action, TAM does not include variables such as subjective norms, normative beliefs, and compliance motivation. Instead, it introduces external variables, allowing us to understand the impact of external factors on users' internal beliefs, attitudes, and behavioral intentions.

TAM adopts the viewpoint that individual attitudes determine behavioral intentions but discards subjective norm factors controlled by normative beliefs and compliance motivation. Davis identified two primary factors determining individual attitudes: Perceived Usefulness and Perceived Ease of Use. Both Perceived Usefulness and Perceived Ease of Use are directly influenced by external factors, and Perceived Ease of Use also exerts a certain impact on Perceived Usefulness. The TAM model is illustrated in Figure 1[5].
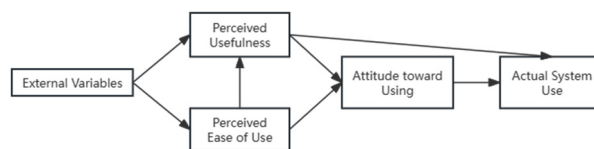


**Figure 1** TAM Model

## 2.2 SPOC

SPOC stands for "Small Private Online Course,"[6] coined by Armando Fox[7] at the University of California. In contrast to the "Massive" scale of MOOCs (Massive Open Online Courses), the "Small" in SPOC represents a smaller scale of course participants. Similarly, the "Private" in SPOC corresponds to the "Open" nature of MOOCs, indicating that access to the course is restricted, and only learners meeting specific criteria can obtain permission to study.

Unlike the "Massive" and "Open" characteristics of MOOCs, SPOCs typically have a student scale ranging from tens to hundreds, and there are restrictive conditions imposed on student participation. SPOC teaching formats are not confined to online learning; they can also involve a combination of online and offline components. The smaller class size in SPOCs allows for better teacher intervention and management, enhances resource utilization, and facilitates in-depth student learning compared to MOOCs.

# 3 Research Design

## 3.1 Research Questions

Based on the TAM model and the characteristics of SPOC courses, the study establishes a regression model for the SPOC blended teaching mode by taking clarity of learning content as the independent variable, behavior as the dependent variable, and perceived usefulness, perceived ease of use, and attitude toward using as mediating variables. The aim is to explore the influencing factors on the intention to adopt the SPOC blended teaching mode.

Research hypotheses are as follows:

H1: Clarity of learning content has a positive effect on behavioral intention.

H2: Clarity of learning content has a positive effect on perceived ease of use.

H3: Clarity of learning content and perceived ease of use have a positive effect on perceived usefulness.

H4: Clarity of learning content, perceived ease of use and perceived usefulness have a positive effect on attitude toward using.

H5: Clarity of learning content, perceived ease of use, perceived usefulness, and attitude toward using have a positive effect on behavioral intention.

## 3.2 Research Tools

The study employs the Technology Acceptance Model (TAM) framework and utilizes the social science statistical software SPSS 26 for data analysis and regression model construction. By examining the impact of variables such as clarity of learning content, perceived usefulness, perceived ease of use, and attitude toward using on the intention to adopt the SPOC blended teaching mode, the research aims to investigate the influencing factors and characteristics of university students' intention to accept the SPOC blended teaching mode.

### 3.3 Questionnaire Design

Based on preliminary interview research, a questionnaire was designed for the intention of university students towards the SPOC blended teaching mode. It includes sections on basic information, online course platforms, and blended teaching modes. The scale adopts the Likert 5-level scale format, comprising a total of 17 measurement questions. The initial test used the social science statistical software SPSS to conduct reliability testing on the scale, with Cronbach's α at 0.615, indicating that the selected measurement variables in the questionnaire can measure and explain latent variables.

### 3.4 Research Subjects

The study focuses on first and second-year undergraduate students participating in the "Health Management" MOOC course. From Table 1, it shows that a total of 318 valid questionnaires were collected, with 131 male participants, constituting 41.2% of the total, and 187 female participants, constituting 58.8% of the total. Among the participants, 147 were freshman, accounting for 46.2% of the total, and 171 were sophomore, accounting for 53.8% of the total.

**Table 1** Student Attribute Statistics

| Attribute | Item | Amount | Proportion |
|---|---|---|---|
| Gender | Male | 131 | 41.2% |
| | Female | 187 | 58.8% |
| Grade | Freshman | 147 | 46.2% |
| | Sophomore | 171 | 53.8% |

## 4 Online Learning Behavior Analysis

### 4.1 Model Fitness Test Results

AMOS 22.0 software was used for path analysis employing the maximum likelihood estimation method, and the model fit test results are presented in Table 2, and the critical value criterion is referred to Wu Minglong's "Structural Equation Modelling"[8]. Overall, the fit indices for various model indicators are quite acceptable.

**Table 2** Fitting parameters of the structural equation modeling

| Name | $X^2$ | df | P | $X^2$/df | RMSEA | CFI | NNFI |
|---|---|---|---|---|---|---|---|
| Test Results | 3.586 | 5 | 0.61 | 0.717 | 0 | 1.107 | 1.214 |
| Critical Value | - | - | >0.05 | <3 | <0.10 | >0.9 | >0.9 |
| Fitness Results | acceptable | acceptable | acceptable | acceptable | acceptable | acceptable | acceptable |

Note: ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively.

### 4.2 Regression Model Construction

Table 3 illustrates regression model for the relationship between clarity of learning content, perceived ease of use, perceived usefulness, attitude toward using, and behavioral intention:

Behavioral Intention=9.133+0.024×Clarity of Learning Content+0.022×Perceived Ease of Use+0.153×Perceived Usefulness−0.012×Attitude toward Using

**Table 3** Chain Mediation Effect Model Coefficient Table

|  | Behavioral Intention | Perceived Ease of Use | Perceived Usefulness | Attitude toward Using | Behavioral Intention |
|---|---|---|---|---|---|
| Constant | 10.97 | 10.975 | 9.828 | 10.489 | 9.133 |
| Clarity of Learning Content | 0.029 | 0.03 | 0.014 | -0.095 | 0.024 |
| Perceived Ease of Use |  |  | 0.14 | -0.013 | 0.022 |
| Perceived Usefulness |  |  |  | 0.148 | 0.153 |
| Attitude toward Using |  |  |  |  | -0.012 |
| Sample Size | 318 | 318 | 318 | 318 | 318 |
| $R^2$ | 0.001 | 0.001 | 0.028 | 0.02 | 0.023 |
| Adjustment $R^2$ | -0.002 | -0.002 | 0.021 | 0.011 | 0.011 |
| F | $F_{(1, 316)}=0.326$, P=0.568 | $F_{(1, 316)}=0.289$, P=0.591 | $F_{(2, 315)}=4.458$, P=0.012** | $F_{(3, 314)}=2.168$, P=0.092* | $F_{(4, 313)}=1.87$, P=0.115 |

Note: ***, **, and * represent significance levels of 1%, 5%, and 10%, respectively.

From Table 4 and Figure 2, it is evident that the direct effect of Perceived Ease of Use on Perceived Usefulness is 0.14 ($P < 0.001$), with a 95% confidence interval of (0.047 to 0.234). Additionally, the direct effect of Perceived Usefulness on Attitude toward Using is 0.148 ($P < 0.05$), with a 95% confidence interval of (0.005 to 0.292). The direct effect of Perceived Usefulness on Behavioral Intention is 0.153 ($P < 0.05$), with a 95% confidence interval of (0.034 to 0.272). The total effect of Clarity of Learning Content on Behavioral Intention is 0.029.

**Table 4** Summary Table of Mediation Effect Testing Process Results

| Effect | Item | Efficiency Value | Standard Error | t | P | Lower Bound of the 95% Confidence Interval | Upper Bound of the 95% Confidence Interval |
|---|---|---|---|---|---|---|---|
| Direct Effect | Clarity of Learning Content=>Behavioral Intention | 0.024 | 0.05 | 0.481 | 0.631 | -0.075 | 0.123 |
| Indirect Effects Process | Clarity of Learning Content=>Perceived Ease of Use | 0.03 | 0.056 | 0.537 | 0.591 | -0.08 | 0.139 |
|  | Clarity of Learning Content=>Perceived Usefulness | 0.014 | 0.047 | 0.3 | 0.764 | -0.078 | 0.106 |
|  | Perceived Ease of Use=>Perceived Usefulness | 0.14 | 0.047 | 2.961 | 0.003*** | 0.047 | 0.234 |
|  | Clarity of Learning | -0.095 | 0.061 | - | 0.119 | -0.214 | 0.025 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | Content=>Attitude toward Using | | | 1.562 | | | |
| | Perceived Ease of Use=>Attitude toward Using | -0.013 | 0.062 | -0.214 | 0.831 | -0.135 | 0.109 |
| | Perceived Usefulness=>Attitude toward Using | 0.148 | 0.073 | 2.041 | 0.042** | 0.005 | 0.292 |
| | Perceived Ease of Use=>Behavioral Intention | 0.022 | 0.051 | 0.429 | 0.668 | -0.079 | 0.123 |
| | Perceived Usefulness=>Behavioral Intention | 0.153 | 0.06 | 2.533 | 0.012** | 0.034 | 0.272 |
| | Attitude toward Using=>Behavioral Intention | -0.012 | 0.047 | -0.259 | 0.796 | -0.104 | 0.08 |
| Total Effect | Clarity of Learning Content=>Behavioral Intention | 0.029 | 0.05 | 0.571 | 0.568 | -0.07 | 0.128 |
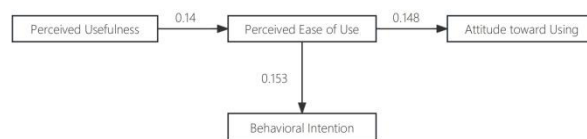


**Figure 2** The Result of Chain Mediation Analysis

# 5 Result

## 5.1 Factors influencing the acceptance of the course

Students participating in the "Health Management" course affirmed the clarity of content, perceived usefulness, ease of use, willingness to use, and behavioral intention of the SPOC blended learning course. In other words, students believe that the offered SPOC course has a certain teaching effect, and this teaching mode has gained basic approval from students. Among these factors, perceived usefulness is the highest, indicating that the combination of online and offline course modes has a certain impact on students' learning of relevant courses and knowledge. The SPOC blended learning mode can help students master the content of health management. However, the willingness to use is the lowest, suggesting that students' acceptance of the SPOC course is relatively low. SPOC courses are a new teaching mode based on the development of the Internet. Although they have been widely used in teaching in many fields, students still need some time to adapt to this new teaching method, accepting the transition from traditional teaching modes to a combination of online and offline courses.

## 5.2 Construction of online learning platforms

The model validates that students' attitudes toward usage are positively influenced by perceived usefulness, which directly impacts online learning behavioral intentions. Perceived usefulness and perceived ease of use provide students with the necessary intrinsic motivation for online self-directed learning. This intrinsic drive, coupled with behavioral intentions, further determines individual learning actions. To enhance learners' perceived usefulness and ease of use, there is a higher demand for the development of online resources. Beyond ensuring the ease of use and convenience of the course platform interface and related functions, it is essential to meet the characteristics of different courses, improve the overall user experience of the online learning platform, and create better conditions for SPOC courses, thereby enhancing usability.

## 5.3 Suggestions for SPOC Course Development

Given the diverse learning and growth backgrounds of students, along with varying learning styles, it is recommended that the platform further analyze learners through big data. Based on different learners' styles and preferences, the platform should offer functional modules that match diverse learning styles, deepen blended learning scenarios, provide personalized services, and enhance the overall experience of SPOC blended mode courses. Additionally, SPOC courses should emphasize the integration of online and offline components. Actively collaborating with educational institutions, introducing more high-quality blended courses, and improving the overall quality of the platform's courses are essential for creating a high-quality course platform and attracting more students and educators to participate in SPOC courses.

# 6 Conclusion

The practice of hybrid teaching based on the internet and self-directed learning activities is increasingly growing, leading to a shift from a teacher-led to a student-centered model in traditional classrooms. SPOC, a new hybrid teaching model that combines traditional classroom and online teaching, effectively stimulates students' learning enthusiasm and improves learning efficiency[9]. SPOC integrates online self-study for students and offline guidance from teachers, fostering students' abilities for independent learning and inquiry[10]. It has been widely used in various disciplines[11] such as artificial intelligence[12] and medicine[13] in both domestic and international education. However, the extent of students' acceptance of this new teaching model remains limited, posing higher demands on course design. It is crucial to better consider the utility and user-friendliness of online course resources for students and further enhance SPOC courses, making full use of online course resources.

# Reference

[1]     Yang Xuefei. On the Construction and Influencing Factors of SPOC-based College English Teaching Model[J]. Journal of Sichuan International Studies University, 2019,35(2):146-154.

[2]     KUANG Shanyun, ZHANG Hui, LU Yun, et al. On Influencing Factors of College Students'

learning Intention at SPOC[J]. Modern Distance Education, 2019(5):34-42.

[3]     Fishbein M , Ajzen I. Belief, Attitude, Intention and Behaviour: An Introduction to Theory and Research. Addison-Wesley, Reading MA[J].Philosophy & Rhetoric, 1977, 41(4):842-844.

[4]     Davis,F.D. Perceived usefulness,perceived ease of use, and user acceptance of information technology[J]. MIS Quarterly, 1989,(13): 319-340

[5]     Davis F D, Baogozzi R P, Warshaw P R. User acceptance of computer technology: A comparison of two theoretical models[J]. Management Science, 1989, 35(8):982-1003.

[6]     Yeqin K. An analysis on SPOC：Post-MOOC era of online education[J]. Tsinghua Journal of Education, 2014,35(1):85-93.

[7]     Fox A, Patterson D A, Ilson R, et al. Software engineering curriculum technology transfer: lessons learned from MOOCs and SPOCs[J]. UC Berkeley EECS Technical Report, 2014.

[8]     Minglong W. Structural equation modeling: operation and application of Amos[M]. Chongqing: Chongqing University Press, 2009: 52-53.

[9]     Xiaojun G, Liyuan H, Yuwan L, et al., Application of SPOC combined with "five - step" teaching method on literature discussion course of nursing master's degree students[J]. Chinese Nursing Research, 2023,37(18):3382-3387.

[10]     Yan S, Rong L, Bin J. Exploration of ideological and political education in Pathogenic Biology and Immunology based on SPOC and BOPPPS teaching mode[J]. Chinese Journal of Immunology, 2023,39(6):1225-1229.

[11]     HAMOEN E C,DE JONG P G D,VAN BLANKENSTEIN F V, et al. Design and first impressions of a small private online course in clinical workplace learning: questionnaire and interview study[J]. JMIR Med Educ, 2022,8(2):e29624

[12]     TSAI C C, CHUNG C C, CHENG Y M, et al. Deep learning course development and evaluation of artificial intelligence in vocational senior high schools[J].Front Psychol,2022,13:965926.

[13]     CHI M X, WANG N J, WU Q, et al. Implementation of the flipped classroom combined with problem-based learning in a medical nursing course: a quasi-experimental design[J]. Healthcare, 2022, 10(12):1-11.