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# Analysis on Influencing Factors of Art Application Behavior of Comprehensive Materials among Art Undergraduates in Chengdu Colleges

**Xueyong Zhang***

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## Abstract

**Purpose:** The study examines the affecting factors of the undergraduate students in art major using comprehensive materials for creation in Chengdu. Perceived Usefulness (PU), Perceived Ease of Use (PEOU), Social Influences (SI), Subjective Norms (SN), Attitude Toward Using (ATU), Behavioral Intention (BI), all these variables have a direct or indirect effect on Behavior. **Data and methodology:** The determinants of the study are adapted from theory of planned behavior (TPB), technology acceptance model (TAM) and flow theory. This study uses the index of the item-objective congruence (IOC) to measure the validity of content. IOC was evaluated by three experts and analysis based on the item's objective suitability index of the project. Reliability of each measurement item was ensured by conducting a preliminary test. Confirmatory factor analysis (CFA) and the structural equation model (SEM) were used to measure and test the questionnaire data. **Results:** The results show that PU is the direct factor affects art majors' attitude toward using comprehensive materials, while PEOU has no significant impact on it. Students' attitude toward using comprehensive materials, SI and SN has been proved to have impact on BI, and behavioral intention directly affects the final behavior. **Major findings:** The data shows that the artistic creation of comprehensive materials is widely applied in universities. Students' use of comprehensive materials is mainly influenced by the PU of it, and students' ATU, BI are the biggest factors influencing their final behavior.
**Keywords:** Comprehensive Materials Art, Art Education

**JEL Classification Code:** Z11, I21, L84

## 1. Introduction

### 1.1 Background of this Research

Art education is a key part of aesthetic education. The purpose of art education for the educated is to cultivate their aesthetic concept, exercise their aesthetic ability, and enhance their artistic creativity. In recent years, China has gradually attached importance to art education, and more and more scholars and workers are engaged in the art industry. However, the current domestic art education is usually a conventional systematic education, and the teaching plans, textbooks, and teaching processes are very old-fashioned. In the process of art education in China, more attention is placed on the cultivation of students' basic skills and theoretical knowledge of art, and less attention is paid to

1 * Xueyong Zhang, Ph.D. Graduate, School of Business and Advanced Technology Management, Assumption University, Bangkok, Thailand. Email: 573302974@qq.com

students' personality and creativity, which leads to obvious deficiencies in students' freedom of thought. However, the comprehensive material art emphasizes the spark of creative ideas, which is less restrictions on creative materials, methods and ideas, and has great advantages in cultivating students' personality and creativity.

Comprehensive materials art refers to the artistic creation of many different materials. Artists choose a variety of media and materials (usually three or more) to give the work a strong visual language, breaking the traditional single way of creating. Through the combination of two and three dimensions has blurred the boundary of many artistic types, so as to express and convey emotions more freely (La Nasa et al., 2019). At present, the concept of "comprehensive material art" mainly includes the following three points: "Evolution of Single Painting material Techniques", "Multi-painting or mutual infiltration of various techniques" and "Original ecological expression" (Zhao, 2009).

Comprehensive materials course is to train students' creative consciousness and creative ability as the basic principles, training students to rigorous process and logic thinking, to master the basic material properties, modelling principle and artistic skill, emphasizing material experiment and study of initiative and creativity, advocate for experimental material, through the student's own experience and practice (Yan, 2020).

Comprehensive materials art teaching from the current situation is move forward in the exploration. The teaching practice has proved that the setting of comprehensive materials course plays an irreplaceable role in cultivating and improving students' artistic creativity, artistic perception and the ability to use and integrate different art materials to create. In the open and dynamic contemporary international cultural environment, it is the general trend of contemporary education to promote the development of traditional art teaching mode towards multi-level and multi-latitude direction.

## 1.2 Objectives of this Research

a) To explore the influencing factors of the use behavior of comprehensive material art for art undergraduates in Chengdu colleges and universities.

b) To study the correlation between variables that have significant influence on users' final behavior, such as perceived usefulness and attitude toward using, to determine the factors influencing students' usage of comprehensive materials.

c) To provide reference for the follow-up related theoretical and practical basis for comprehensive materials teaching, so as to ultimately improve the professional learning efficiency of art students.

## 1.3 Questions of this Research

a) How can teachers and administrators improve students' cognitive efficiency of abstract art creation by improving the teaching process of comprehensive materials?

b) What are the influencing factors for art majors in Chengdu universities to accept the use of comprehensive materials?

c) What are the recommendations for following related research and for comprehensive materials teaching practice?

## 1.4 Conceptual Framework

The researcher proposes an improved conceptual framework mainly based on the application and results of students who study comprehensive materials creating in Chengdu, China. The TAM and TPB theories are used to develop the conceptual framework for this study. The theoretical framework of Emmanuel Fokides (2017) supported that perceived usefulness and perceived ease of use can significantly affect users' attitude toward using. Samuel NiiBoi Attuquayefio and Addo (2014) studied relationship between social influence and behavioral intention. Savaş and Deniz's (2019) proven the relationship among the three main variables, which showed that subjective norms, behavioral intention and behavior formed a progressive influence relation. The conceptual framework of this examination is shown in Figure 1.

According to the previous research framework, the framework model of this paper proposed in this paper aims to study the influencing factors of behavior. This paper supposes perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using (ATU), subjective norms (SN), social influence (SI), and behavioral intention (BI) will profoundly influence the behavior of art major students from the universities in the Chengdu, China. Regarding conceptual framework, the researcher provides six hypotheses to investigate relationships between each two variables.

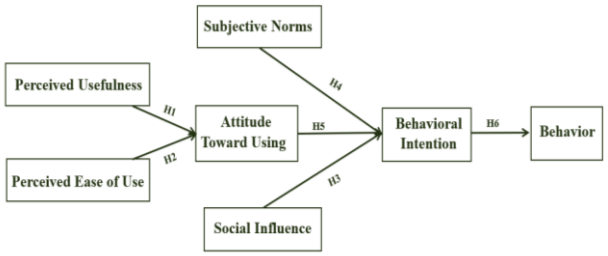


**Figure 1**: Conceptual Framework

### 1.5 Use of Word Processing Software

Through the investigation on the behavior of art students using comprehensive materials, this paper hopes to make corresponding contributions to the art teaching of comprehensive materials in theory and practice in colleges.

Fishbein and Ajzen (1975) noted that the executive power of a particular behavior is affected by its intention, and the stronger the intention, the stronger the executive power of the behavior. By studying the factors which can affect students' art creating behavior, the research helps to meet students' relevant needs in actual teaching and creation, improve students' learning achievements, and apply comprehensive materials to their own artistic creation.

## 2. Literature Review

### 2.1 Perceived Usefulness

Davis et al., (1989) defined perceived usefulness as the subjective likelihood of a potential user that his/her performance in a certain environment would be increased due to the use of specific application systems. The extent to which the use of technology was useful for achieving goals is a measure of perceived usefulness (Davis et al., 1989). On the other hand, Bhattacherjee and Sanford (2006) suggested that perceived usefulness means that users expected that an IT system will benefit their work performance and that would be an important consideration when people choose a system to help them do task better in the workplace. Factor analyses shown that the perceived usefulness and perceived ease of use were statistically distinct dimensions (Davis et al., 1989). In addition, both perceived usefulness and perceived ease of use affect an individual's attitude toward a kind of technology (Fishbein & Ajzen, 1975).

**H1:** Perceived usefulness has significant influence on attitude toward using.

### 2.2 Perceived Ease of Use

Davis et al., (1989) posited that perceived ease of use is an antecedent of perceived usefulness. PEOU was a person's belief that using a particular technique for a particular purpose will do more with less effort; but at the same time the effort reduced by the use of technology by users in a particular task must exceed the effort required to learn how to use the technology (Davis et al., 1989). The basic feature of perceived ease of use has another dimension, in which it was the extent to which an individual believes that using a system makes actions easier to complete and minimizes the psychological costs (Gruzd et al., 2012). PEOU helps to create a good impression of the tool available, thus encouraging users to adopt and use the tool. PEOU has direct causal relationship with PU and indirect causal relationship with BI (Liu et al., 2009). Perceived ease of use is widely used in the technology acceptance model, in which primitive factors affect people's use behavior of a certain technology or system. So that PEOU is an important structure adopted in TAM.

**H2:** Perceived ease of use has significant influence on attitude toward using.

### 2.3 Social Influence

Social influence meant the influence and effect on individual's thoughts, feelings, attitudes, or behaviors. It can not only change the behavior intention of people, but also made the individual affected by the behaviors of others (Fishbein & Ajzen, 2005). Also, Ajzen (1991) indicated that the more positive the surrounding people are to the user's behavior, the more favorable it is to subjective standards. Therefore, social influence has been proved to be a reliable influencing factor for users' acceptance of a certain technology or thing. Social influence was an awfully common social psychological phenomenon, which referred to the process of person's behavior and state of mind changing towards the course of social dominance due to social pressure. It was typical social psychological phenomenon that reflected the behavior and attitude of a person influenced by the social atmosphere or pressure. It included compliance, social facilitation, social sluggishness, gather polarization and bunch considering (Nuttavuthisit & Thøgersen, 2017).

**H3:** Social influence has significant influence on behavioral intention.

### 2.4 Subjective Norms

Subjective norms referred to the belief that an important person or group of people will approve and support a particular behavior (Venkatesh, 2000).

Subjective norms are determined by the perceived social pressure from others for an individual to behave in a certain manner and their motivation to comply with those people's views. The definition of a subjective norms in the TAM context is the perception of people so that people who are important to him think he should or should not act the behavior in question. The subjective norms in the TRA model referred to the social pressure exerted on the individuals when they chose to perform or not perform the behaviors as others' expectations (Ajzen & Fishbein, 1980).

**H4:** Subjective norm has significant influence on behavioral intention.

### 2.5 Attitude Toward Using

Attitude toward using was an important predictor of behavior intention. It was a stable psychological tendency of an individual towards a specific object (Ajzen, 1991). It showed the feeling of the individual whether approved the behavior or not and (Al-Debei et al., 2013) explained a person's preference for an action or an object (Ozgen & Kurt, 2013). A series of studies had shown that there was a positive connection between attitude toward using and purchase intention. For example, consumers' attitudes towards products were directly related to their willingness to consume (Amos et al., 2008). The theory of reasoned action (TRA) holds that subjective norms and attitude toward using are the two main factors that determine behavior and intention (Fishbein & Ajzen, 1975).

**H5:** Attitude toward using has significant influence on behavioral intention.

### 2.6 Behavioral Intention

As the main dependent variable identified in the studies, behavioral intention is characterized as a particular behavior which a person was inclined to perform. Behavioral intentions are driven by attitude and perceived usefulness. Intention is often defined as the degree to which people are willing to try hard and how much effort they plan to put in, in order to accomplishing a goal (Ajzen, 1991). Behavioral intention can also be understood as a person's degree of preparation for a specific behavior. The technology acceptance model shows that an individual's behavioral performance is predicted by one's behavioral intention. In line with the reasoned action theory, one's behavioral intention could be impacted by people's attitude (Ajzen & Fishbein, 1980).

**H6:** Behavioral intention has significant influence on behavior.

### 2.7 Behavior

Behavior was defined as the possibility that the student would adopt a certain system (Ajzen & Fishbein, 1980). The user's behavior of specific individuals will be directly affected by the behavioral intention. In the TAM model, actual behavior is redefined as actual use of the system, or the user chooses to use the system and then performs it as a behavior (Davis et al., 1989). Davis et al. (1989), believed that actual behavior is the application of a certain actual system, or the user's choice to use the system, and then evolve an action. According to Kim and Kwahk, (2007) the definition of behavior is the use behavior of a certain technology, which contains two levels of meaning, one is the use frequency, the other is the use time.

## 3. Research Methods and Materials

### 3.1 Research Methodology

The research method of this paper is based on quantitative research method, which mainly uses questionnaire as the main tool of data collection. To improve the reliability, a pilot study was carried out, and a questionnaire was distributed to the art students and the staff of the institutions through Google form survey. Interviewed users need to fill out a questionnaire separately. The researchers chose five representative universities to be the targeted universities: Chengdu University (CDU), Sichuan University (SCU), Sichuan Normal University (SNU), Southwest Minzu University (SMU) and Chengdu Academy of Fine Arts (CAFA). Sample size questions were frequently asked for qualitative studies based on individual investigator questions (Trotter & Robert, 2012). The sample size represented a specific population of the study. The investigation has been divided into three sections: the screening question, five-point Likert scale measurement and demographic information. the researcher designed the first part of the questionnaire to be a screen question to screen the respondents if they were qualified for this study. As this study focused on students who have had known about the educational art in Chengdu higher institutions in Chengdu, the screening question was "Which university are you studying?" A single answer multiple choice balance was used to the screening questions. Second, Demographic information statistics is used to screen basic information such as gender, direction and affiliation of respondents (Lodico et al., 2006). Finally, by using the Likert scale, researchers were able to identify respondents' attitudes with a statement contributed by Weathington and Bechtel (2012),

so the researchers developed a multiple-item measurement standard by using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Bardhoshi and Erford (2017) stated that Cronbach's Alpha was used when the item response model had multiple scores, such as the Likert scale. In this study, Cronbach's alpha reliability was applied in a pilot test to verify the reliability of each item's composition. In this study, the project-goal consistency (IOC) index was used as the content validity of the research tool to study the validity of the factors proposed in this paper that influence the behavior of art majors in Chengdu universities using comprehensive materials. In addition, after researchers generated the measurements, the pilot studies needed to verify their validity. After the study tool was fully modified and ready for final investigation, a pilot test of 30 participants was conducted before the questionnaire was distributed to all target populations.

After conducting validity and reliability assessments and basic data collection, researchers sent paper questionnaires to 500 undergraduate s from selected universities. Then the researchers used Confirmatory factor analysis (CFA) to measure and test the validity and reliability of the conceptual model. inferential analysis (IA), goodness of fits (GOF) and parsimonious fit measures (PFM) to evaluate factor loading, composite reliability (CR), average variance extracted (AVE), and discriminant validity. Finally, structural equation model (SEM) was used to evaluate the implications of the hypothesis and the direct and indirect relationships between potential variables.

### 3.2 Population and Sample Size

The target population of this research is undergraduates majoring in art from five comprehensive universities in Chengdu, China. the researcher chose the university students who study in Sichuan University, Chengdu University, Sichuan Normal University, Chengdu Academy of Fine Arts and Southwest Minzu University majored in Art. According to Williams et al., (2010) the minimum sample size for complex models was 500 cases. Therefore, the researchers collect 500 samples for five higher education institutions in Chengdu for the better statistical result from 800 responses for this study.

### 3.3 Sampling Strategy

The researchers adopted multi-stage Sampling technology, including judgment sampling, convenience sampling in different stages. First, the researchers used a judgment sampling method to gained 800 responses of undergraduate students studying art creation at five comprehensive art schools in Chengdu, China, who had received at least a period of study in comprehensive material creation. Secondly, stratified random sampling was carried out to select 500 samples. The 500 samples obtained by stratified random sampling are shown in Table 1.

**Table 1:** The number of questionnaires distributed to colleges and universities in Chengdu China

| Universities | Numbers of Responses | Proportional Sample Size | Percentage allocation (%) of Sample Size |
|---|---|---|---|
| Total | 800 | 500 | 100 |
| Sichuan University | 120 | 75 (500/800·120) | 15 |
| Chengdu University | 200 | 125(500/800·200) | 25 |
| Sichuan Normal University | 112 | 70(500/800·112) | 14 |
| Chengdu Academy of Fine Arts | 208 | 130(500/800·208) | 28 |
| Southwest Minzu University | 192 | 120(500/800·192) | 26 |

## 4. Results and Discussion

### 4.1 Demographic Information

The demographic population was often used to categorically measure respondents' attributes such as education level, gender, and age. In this study, the researcher collected 500 questionnaires from those five universities, from which the major and grade distribution of the respondents were determined. According to the statistical results (Table 2), the number of undergraduates studying art and design was the largest with 161, accounting for 32.2% of the total. The second and third were oil painting and traditional Chinese painting, accounting for 31.0% and 24.4% respectively. The number of sculpture majors was the least, with only 62, accounting for 12.4%. For the academic years, there were 151 sophomore students account for 30.2%, 192 junior students account for 38.4%, and 157 senior students account for 31.4%.

**Table 2:** Demographic Characteristics of Respondents in Undergraduates

| Demographic and General Data (N=500) | | Frequency | Percentage |
|---|---|---|---|
| Major | Oil painting | 155 | 31.0% |
| | Chinese painting | 122 | 24.4% |
| | Art design | 161 | 32.2% |
| | Sculpture | 62 | 12.4% |
| Year of Study | Freshman | 151 | 30.2% |
| | Sophomore | 192 | 38.4% |
| | Junior | 157 | 31.4% |

## 4.2 Confirmatory Factor Analysis (CFA)

Bollen (1989) posited that confirmatory factor analysis (CFA) can indicate the composite reliability of all items in the proposed research model. Hence CFA can be considered as a key basis for testing the reliability of SEM (Hair et al., 2010). On the basis of data collection, this study performed the confirmatory factor analysis of the variables, to check the correlation between potential variables and observed variables of the model (Bashir & Madhavaiah, 2015). This paper referred to the ratio of the chi-square value to degree of freedom (CMIN/DF), goodness-of-fit index (GFI), adjusted goodness-of-fit index (AGFI), normalized fit index (NFI), comparative fit index (CFI), Tucker-Lewis index (TLI) and root mean square error of approximation (RMSEA) as the model fitting standards. The items are including perceived ease of use (PEOU), perceived usefulness (PU), attitude toward using (ATU), subjective norms (SN), social influence (SI), and behavioral intention (BI) and behavior (B).The model fit was presented by the acceptable values of goodness-of-fit indices in Table 3. According to SPSS AMOS version 23, the values were CMIN/DF = 2.945, which is lower than < 5.00 (Al-Mamary & Shamsuddin, 2015; Awang, 2012). GFI= 0.890 and AGFI = 0.864, so both of them are higher than 0.85 and 0.80 respectively (Sica & Ghisi, 2007). Qualified GFI suggested a good fit of the target model and null model. The larger the AGFI, the closer the model is to the actual matrix, that is, the higher the degree of fitting. NFI=0.885, which is greater than ≥ 0.80 (Wu & Wang, 2006). CFI = 0.921, greater than 0.80 (Bentler, 1990). TLI = 0.909, and RMSEA = 0.062, which is less than 0.08 (Pedroso et. al., 2016). According to the reference values proposed above, the results in Table 3 show that all study indices conform to the model fit of all reference indices.

**Table 3:** Goodness-of-Fit for Measurement Model in Undergraduates

| Fit Index | Acceptable Criteria | Statistical Values |
|---|---|---|
| CMIN/DF | < 5.00 | 968.770/329 or 2.945 |
| GFI | ≥ 0.85 | 0.890 |
| AGFI | ≥ 0.80 | 0.864 |
| NFI | ≥ 0.80 | 0.885 |
| CFI | ≥ 0.80 | 0.921 |
| TLI | ≥ 0.80 | 0.909 |
| RMSEA | < 0.08 | 0.062 |

In this study, the convergence efficiency was evaluated by using the compound reliability (CR) and the mean variance (AVE). CR value is used as a reliability index to test potential variables, and this reliability test value is also called construct reliability. Similar to cronbach α, The higher the CR value, the higher the internal consistency. The value of composite reliability or CR varies should be between 0 and 1. The AVE value must exceed 0.50 to be sufficient for the convergent validity (Hair et al., 2014).

Consequently, Analysis according to the data in Table 4, all the values of Cronbach's Alpha are above 0.80, factor loadings more than 0.50, composite reliability (CR) more than 0.80 and average variance extracted (AVE) more than 0.50. The construct that had the highest internal consistency according to composite reliability was behavioral intention with the all the values highest.

**Table 4:** Composite Reliability (CR) and Average Variance Extracted (AVE) of Undergraduates

| Variable | CA | Factors Loading | CR | AVE |
|---|---|---|---|---|
| PU | 0.847 | 0.658-0.922 | 0.859 | 0.610 |
| PEOU | 0.864 | 0.643-0.927 | 0.827 | 0.635 |
| SI | 0.817 | 0.626-0.858 | 0.828 | 0.551 |
| SN | 0.859 | 0.628-0.844 | 0.863 | 0.614 |
| ATU | 0.849 | 0.590-0.856 | 0.856 | 0.602 |
| BI | 0.903 | 0.772-0.884 | 0.905 | 0.704 |
| B | 0.874 | 0.655-0.886 | 0.879 | 0.648 |

In addition, the results in Table 5 show that the discriminant validity of each variable is also guaranteed with the AVE for all structures at diagonal line greater than the inter scale correlations. And all values can be well fitted with the reference index. Therefore, the seven hypothetical variables proposed in this study are fully suitable for further study.

**Table 5:** Discriminant Validity in Undergraduates

| | PU | PEOU | SI | SN | ATU | BI | B |
|---|---|---|---|---|---|---|---|
| **PU** | 0.781 | | | | | | |
| **PEOU** | 0.381 | 0.797 | | | | | |
| **SI** | 0.249 | 0.251 | 0.742 | | | | |
| **SN** | 0.344 | 0.268 | 0.209 | 0.783 | | | |
| **ATU** | 0.213 | 0.125 | 0.146 | 0.191 | 0.776 | | |
| **BI** | 0.461 | 0.325 | 0.229 | 0.322 | 0.25 | 0.839 | |
| **B** | 0.252 | 0.239 | 0.178 | 0.282 | 0.189 | 0.291 | 0.805 |

## 4.3 Structural equation model (SEM)

Structural equation model (SEM) was used to multiple correlated the latent variables simultaneously in a model of measurement model, which include five models identification model, specification model, estimation model, evaluation model and modification verification mode (Harun et al., 2016). On the basis of CFA data analysis, the researchers evaluated the structural model by using structural equation model (SEM) to confirm the causal relationship between model variables and the factors that affect the behavioral intention of art students to use comprehensive materials. Table 6 presents the structural model before and after modification by AMOS statistical program to ensure the fitness of model, which shows that CMIN/DF=3.191, GFI=0.866, AGFI=0.839, CFI=0.908, NFI =0.872, TLI=0.897, RMSEA= 0.066. According to the standards in the table, all indicators have passed the goodness of fit test. Hair et al., (2014) concluded that chi square test is the only statistical test for differences between matrices in structural equation modeling. The CMIN/DF result proves that the matrix difference in the target model is small, which means that the relationship between variables in the model is relatively close.

**Table 6:** Goodness-of-Fit for Structural Model after Adjustment of Undergraduates

| Fit Index | Acceptable Criteria | Statistical Values | |
|---|---|---|---|
| | | Before Adjustment | After Adjustment |
| CMIN/DF | < 5.00 | 1258/344 or 3.659 | 1075.5/337 or 3.191 |
| GFI | ≥ 0.85 | 0.847 | 0.866 |
| AGFI | ≥ 0.80 | 0.819 | 0.839 |
| NFI | ≥ 0.80 | 0.851 | 0.872 |
| CFI | ≥ 0.80 | 0.886 | 0.908 |
| TLI | ≥ 0.80 | 0.875 | 0.897 |
| RMSEA | < 0.08 | 0.073 | 0.066 |
| **Model Summary** | **Not in harmony** | **In harmony** | |

## 4.4 Hypothesis Testing Result

SEM testing were used to determine the effectiveness between each structure. Subsequently, the researchers passed standardized path coefficients (β) to measure the degree of correlation between independent variables and dependent variables proposed by each hypothesis. After testing, five of the six hypotheses proved to be valid. The hypotheses testing results show that H1, H3, H4, H5, H6 are supported, whereas H2 are not supported.

From the standardized path coefficients (β) and t-value for per variables shown in Table 7, the following results can be obtained.

**Table 7:** Hypothesis Testing Result of the Structural Model of Undergraduates

| Hypothesis | Path | Standardized Coefficients (β) | t-value | Result |
|---|---|---|---|---|
| H1 | PU-ATU | 0.047 | 3.943*** | Supported |
| H2 | PEOU-ATU | 0.041 | 1.229 | Not Supported |
| H3 | SI-BI | 0.055 | 3.110** | Supported |
| H4 | SN-BI | 0.062 | 5.571*** | Supported |
| H5 | ATU-BI | 0.064 | 4.128*** | Supported |
| H6 | BI-B | 0.059 | 6.397*** | Supported |

**Note:** *=p-value<0.05. Generally, when p-value is less than 0.05, it indicates that the hypothesis is valid. The more *, the smaller the calculated p-value.

**H1** : The standardized path coefficient (β) between perceived usefulness and attitude toward using is 0.047 (t-value = 3.943***). It implies that perceived usefulness has a significant effect on attitude toward using. Several studies also support this result. Perceived usefulness is considered to be a key factor that can predict users' attitudes towards using new technologies (Davis et al., 1989). Schierz et al., (2010) noted that the perceived usefulness of mobile payment services affects user's attitude and usage intention. Pastorella et al. (2016) revealed that that students with higher perceived usefulness of comprehensive materials art, are more likely to create with comprehensive materials. Therefore, higher perceived usefulness means high possibility of attitude toward using.

**H2**: The research results show that there is no significant relationship between perceived ease of use and attitude toward using comprehensive materials with standardized path coefficient (β) = 0.041 (t-value = 1.229). Therefore, the results of H2 are inconsistent with previous studies. Previous studies have shown that if users believe that the technology is beneficial to them, they are more inclined to form a positive attitude toward the technology (Hong et al., 2009). It can be seen that students' perceived ease of use of comprehensive materials cannot have a decisive impact on their attitude toward using. There are two reasons for this situation. First, comprehensive materials art has been taken into the compulsory courses, so students must use this creative skill whether it is simple or difficult. On the other hand, there is little difference in technical difficulty between different types of creation, which means that for art students, it is equally difficult to create with pigments and comprehensive materials, so the degree of difficulty is not

the decisive factor in their use of comprehensive materials.

**H3**: The direct impact of social influence on behavioral intention is relatively significant at standardized path coefficient of 0.055 and t-value at 3.110** in H3, which indicates that social influence has deep influence on behavioral intention. Numerous studies have confirmed that social influence is the most important leading factor of behavioral intention (Chao, 2019; Hao, et al., 2017). Some studies shown that social influence is the key factor on behavioral intention to adopt of learning modes or skills like e-learning, mobile learning (Olasina, 2019; Salloum & Shaalan, 2019; Sung et al., 2015). In conclusion, the positive social influence of comprehensive material art can encourage learners to use comprehensive materials for creation in the learning process.

**H4**: The results of the statistical hypothesis testing revealed that the data support H4, which show that subjective norms effectively affect behavioral intention with the standardized path coefficient (β) at 0.062 (t-value = 5.571***). Yang et al., (2007) found the same result that the subjective norms has a deep impact on the intention of statistics software use in Taiwan. Yadav et al., (2015) found in their research about students' intention to adopt internet banking in India. Hao et al., (2017) believed that the combination of social image and subjective norms might be the decisive factor for users to adopt a certain technology.

**H5**: This result leads to the conclusion that the attitude toward using comprehensive materials have a positive and significant effect on their behavioral intention to use comprehensive materials, based on the standardized path coefficient (β) = 0.064 (t-value = 4.128***). It can be interpreted that A positive attitude toward comprehensive materials can help support individuals′ final application behavior. Research by Lin et al., (2015) in Vietnam by integrating the TAM and TPB reveals that the attitudes affect the intentions in using internet banking. The finding was consistent with Davis (1993), and Lee et al., (2009), hence the students are likely or intent to use comprehensive materials when they have positive or favorable impression towards using it.

**H6**: The results of the statistical hypothesis testing revealed that the influence of behavioral intention toward behavior is supported, based on the standardized path coefficient (β) = 0.059 (t-value = 6.397***). The data show that behavioral intention is the most critical predictor for students to use comprehensive materials for artistic creation, which directly leads to the actual use of comprehensive materials. The results further suggested that behavioral Intention has insignificant effect on Use Behavior which contradicts Venkatesh et al. (2003) prediction. Many researchers defined that behavioral intention is an explicit motivation to engage in a behavior, which can vary in strength depending on the underlying causal factors (Ajzen, 1991).

# 5. Conclusions and Recommendations

## 5.1 Conclusions

This paper will try to study through the analysis of the affecting factors of the undergraduate art students using comprehensive materials for creation in Chengdu, so as to provide reliable data for optimization of comprehensive material teaching in colleges. This research adopts quantitative method to collect and analyze 500 questionnaires from undergraduates with comprehensive material creation experience in five selected colleges and universities. Through confirmatory factor analysis and structural equation modeling, the results confirm the theories and relationships among the perceived usefulness (PU), perceived ease of use (PEOU), social influences (SI), subjective norms (SN), attitude toward using (ATU), Behavioral Intention (BI) and behavior (B). And the reliability and discriminant validity of the measurement mode was confirmed. The final behavior is directly influenced by the behavioral intention (H6), social influence (H3) and subject norms (H4), and the attitude toward using (H5) has the greatest impact on the intention of use behavior. Because perceived usefulness is the main factor affecting attitude toward using (H1), behavioral intentions are indirectly affected by perceived usefulness. This is consistent with previous studies. The positive correlation between PU and attitude toward using has also been confirmed (Hayashi et al., 2004), which means that the benefits of using comprehensive materials are direct and important factors that should be considered when trying to establish students' attitude toward using it. The results of this study are consistent with the theory that perceived usefulness has a direct impact on use attitude and behavioral intention. In addition to theory, this finding is also supported by the research of Fokides (2017) and Vululleh (2018). Subject norms make students believe that they will have better creative achievements by using comprehensive materials for artistic creation, which further positively affects their behavioral intentions. The social influence has the greatest impact on the actual use of comprehensive materials. In this case, colleges and art teachers can give appropriate positive feedback to students' creation using comprehensive materials, and use incentive mechanisms to encourage students to try comprehensive material art creation (Chaka & Govender, 2017). Bagozzi (1988) assumes that an act of an individual is totally determined by the individual's intention to act. Students will have a good impression and willingness to use the skills if they believe that the comprehensive materials help to improve their learning process and creation.

However, the result shows that perceived ease of use has no significant direct impact on attitude toward using (H2), which is not consist with the research of Davis et al., (1989).

One reason may be that whether students find it difficult to create comprehensive materials or not, they must create comprehensive material works of art to complete their required courses. The second reason may be that art students think that there is no obvious difference in the difficulty of different types of art creation. For them, it is equally challenging to give full play to any skills. Therefore, the perceived ease of use of comprehensive material art may not affect its use intention (Figure 2).

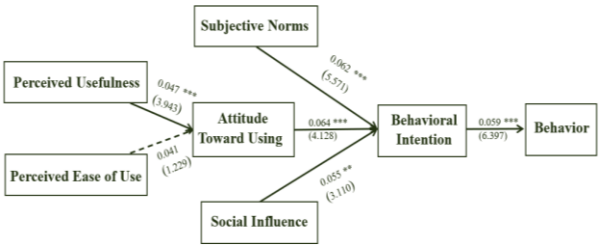


**Figure 2:** Result of the Structural Model of Undergraduates
Note: Solid line reports the Standardized Coefficient with * as p<0.05, and t-value in Parentheses; Dash line reports Not Significant

## 5.2 Recommendations

This study has obtained several supporting factors for the use of comprehensive materials by art majors in Chengdu universities. The existing data statistics can provide research support for colleges to improve the art creation education of comprehensive materials. Therefore, in order to promote the application of comprehensive materials in practice, colleges and universities should take measures to strengthen the influence of the above key factors. The social influence can be led by the school teaching system, the college teaching incentive mechanism and the students' learning atmosphere. So creating a good learning atmosphere for comprehensive materials in the school, and setting up a reward mechanism for the creation of comprehensive materials can make students aware of the enthusiasm of the surrounding people for comprehensive materials. Then, since the attitude toward using and behavior intention are the strongest factors that affect the direct creative behavior of art students, it is necessary to emphasize the usefulness and reliability of promoting the theoretical research. It is necessary for schools to continuously understand the students' use intention and frequency of comprehensive materials. In addition, the above H2 analysis shows that students believe that the difficulty of artistic creation of comprehensive materials is similar to that of other types of creation, and there is no obvious advantage compared with other creation methods in terms of ease. Therefore, it is reasonable to think that improving the perceived ease of use of comprehensive materials makes students feel that comprehensive materials are easier to understand than other types of creation, to a certain extent, can solve the problem that the ease of use of comprehensive materials mentioned in H2 has little impact on students' use attitude. Therefore, if teachers can use external teaching tools or improve teaching methods to objectively improve the perceived ease of use of comprehensive materials, we can change their attitude toward the use of comprehensive materials. Colleges must consider improving this field and ensure that students have a full understanding of comprehensive materials by selecting appropriate and acceptable teaching methods.

## 5.3 Limitation and Further Research

This study has certain limitations that need to be noted. The following are suggestions for further research. Firstly, this study is limited to quantitative methods. Further research can increase qualitative methods such as school internal interview or focus group, which is helpful to identify the inconsistency between quantitative and qualitative results, such as defining a specific factor to observe the influence of this independent variable on the behavior intention of the dependent variable. Secondly, the subjects of this study are all undergraduates who have a certain understanding of comprehensive materials, excluding non-learners of comprehensive material art. Further research may focus on non-users to understand their possible barriers to use.

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