

Article

After the Epidemic, Is the Smart Traffic Management System a Key Factor in Creating a Green Leisure and Tourism Environment in the Move towards Sustainable Urban Development?

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Abstract: The purpose of this study is to explore, after the epidemic, the intelligent traffic management system, which is the key to creating a green leisure tourism environment in the move towards sustainable urban development. First, quantitative research, snowballing, and convenience sampling methods are used to analyze 750 questionnaires with a basic statistical test, t-test, ANOVA test, and the Pearson product–moment correlation coefficient (PPMCC) method. Qualitative research and a semi-structured interview method are used to collect the opinions of six experts on the data results. Finally, the results are discussed with the multivariate inspection method. Although the current electric bicycle system is convenient, the study found that the service quality of the airport is sufficient; that the fare of the subway is low and popular with students if the system can ease the crowd during peak hours; and that the login and security check time can be shortened, which can help improve the operating convenience of the system interface and link the information of leisure and tourism activities. On the other hand, adjusting fares, increasing seats, planning for women-only ticketing measures and travel space, providing disinfection or cleaning facilities in public areas, and improving passenger's public health literacy and epidemic prevention cooperation will further enhance the student travel experience, improve the smart city and green tourism network, and help achieve sustainable urban tourism.

Keywords: smart transportation; green tourism environment; urban tourism network; urban sustainability

1. Introduction

The advancement of science and technology, the improvements in safety and performance, the efficiency of transportation vehicles, and the shortening of the distance and time of human interaction are important factors to accelerate the exchange of human civilizations, spawning leisure and tourism activities, and promoting the development of the overall economy and industry [1–3], as well as to the construction of human civilization cities. However, with the surge of the human population and the rise in leisure and tourism awareness, the speed and frequency of transportation have increased. A large amount of energy has been consumed simultaneously, resulting in serious waste gas, oil pollution, and domestic waste, and destroying the natural ecology and human living environment [3–5].

As a result, the global climate is abnormal, the natural ecology and human living environment are affected, and the degree of impact gradually exceeds the positive economic benefits, which has caused the United Nations and governments of various countries to face this issue [6–10].

Therefore, governments and scholars around the world advocate that, combined with green energy technology and cloud technology, to construct an urban transportation management system with low carbon and low environmental pollution, the negative impact of human activities must be reduced [11,12]. Planning can assist urban development and the transportation needs of human life [6–10,13,14]; finally, these will reach the Smart City of Intelligent Community Forum and achieve the goal of human and environmental sustainability [15,16], thus representing an important agenda for future human development and urban development and construction.

A smart city makes full use of communication information and communication technology to measure, analyze, and integrate the management and operation of a city's livelihood, environmental protection, public safety, urban services, industrial and commercial trade, leisure, and tourism activities, and also aims to use corresponding intelligent reflections to create a modern city with information and service automation [17]. A smart transportation system refers to an online consumption and browsing mode based on information and service automation, providing tourists with exclusive needs, and improving the quality of tourism activities and services [18]. It includes cloud computing, Internet of Things (IoT), Internet technology, as well as information technology, mobile technology above 3G, geographic information, sensing technology, artificial intelligence, and other technologies integrated information service systems [19]. It is initially used for software and hardware facility management, ticketing, and other services in amusement parks. Later, it is developed for sales, ordering, and transaction services in restaurants and hotels. It is currently used in urban public transportation vehicles, taxis, and shared bicycles associated with tickets, sales, use, experience, and other services [20,21]. Therefore, we can see that smart cities use cloud technology and technique to provide people with more convenient consumption and services. If intelligent technology can be used in tourism consumption environment models and concepts, it will be possible to construct smoother and more convenient leisure and tourism behaviors. These are of great significance for the development of sustainable smart cities.

The smart transportation system uses personal smart phones or devices with Internet technology which provide the public with services such as frequency inquiry, ticket booking, boarding, and use [22]. It also assists managers in carrying out vehicle management and safety monitoring, traffic control, and other measures [23]. It could also provide sales links for enterprises in various fields within the scope of services [24]. Finally, a highly efficient but invisible distribution network, sales, and management can be established, constituting various new economic and consumption patterns [25].

China has been committed to improving economic development and quality of life [26], which has also caused serious carbon emissions. China is still one of the world's main exploration and emission country [27], second only to the United States [28], and has attracted global attention [6,7]. In order to change the negative international phenomenon, China continues to improve economic construction and quality of life in an attempt to improve green transportation technology and vehicle utilization [29]. In addition, in recent years, it has devoted itself to local construction, promoting the development of leisure and tourism, in order to stimulate the rural economy and achieve sustainable development goals [30]. The use of cloud technology and techniques, combined with green energy transportation technology and vehicles to maintain transportation energy, reduce carbon emissions, achieve the goal of coexistence between human urban development and the environment, and shape smart leisure and travel city, is an important indicator of China's current development [31].

Although Fuzhou is located in the Fujian Province on the mainland, the city is surrounded by tourism features, such as southern Fujian culture, hot springs, leisure, river

tours, sea tours, and natural ecology. Fuzhou has also airports and electric transportation vehicles, such as high-speed railways, trains, buses, and yachts. The city also plans to plan electric public bicycles, automobiles, and other facilities. With the establishment and management of the smart transportation booking system, the city has provided at least 200 subway trips per day, 297 domestic high-speed rail trips, 30 flights, and 400,000 shared bicycles and other transportation services [32–34]. Not only has the city provided people with services such as living consumption and tourism transportation, reaching 183 million tourists, but it has also created business opportunities of USD 32.358 billion. We can see that the development of intelligent transportation systems has contributed and affected people's living consumption and urban leisure and tourism development.

Although the smart transportation system uses personal mobile devices and cloud technology [35] to provide tourism information query and consumption functions, such as life, leisure, travel, and food [20–25], for college students who generally do not have private transportation and are underfunded, the city should help build convenience in life. The consumption pattern has been more conducive to inducing leisure and tourism activities, thereby improving personal physical and mental health [35]. However, various decisions might change due to various factors between the planning, promotion, and actual execution process [36]. This usually takes a period of time to produce but usually leads to errors in making decisions based on results and expectations [37,38]. The answer can usually be obtained from the user's actual experience and perception of the decision-making planning, soft-image facilities, and expected performance goals [37,39]. Therefore, if the decision-making of the smart tourism transportation booking system and the potential problems of electric transportation vehicle planning can be discovered in time, and improvement measures are proposed, the cost consumption of relevant management units and the government can be reduced, the decision-making effect will be improved, and the public's confidence in the government's decision-making can be enhanced [40].

Although the current cloud technology and techniques have been used in the leisure, tourism industry, and activities for many years, relevant scholars have conducted many discussions on the development and application of smart transportation systems [41] and the effectiveness of the connection between software systems and related industry development [42], tourism itinerary planning [43], and tourism system experience [44]. However, from the perspective of college students, analyzing the development effect of urban smart tourism environment is rare, especially using directions of tourism involvement, leisure satisfaction, and tourism willingness to jointly discuss this issue [45,46]. Therefore, as the researchers, we believe that from the perspectives of college students' experience value, leisure involvement, satisfaction, and willingness to participate, we can explore the effect of smart tourism transportation APP on the construction of urban smart tourism environment. We can better understand whether combining cloud technology and public transportation vehicles to create a smart leisure and tourism environment may be conducive to college students' participation and improve the development effectiveness of related industries and activities.

To sum up, the main purpose of this study is to analyze the feasibility of a smart transportation booking system for building a sustainable smart city tourism environment from the perspectives of experience value, tourism involvement, satisfaction, and consumption willingness with college students as the object, as well as to understand the real feelings of college students using related software in leisure and tourism activities. We would also like to discover the advantages and inconveniences of relevant decisions and systems for college students' consumption. We believe that this result can help policymakers and other city government agencies provide improvement suggestions; develop a more appropriate and user-friendly smart transportation booking system; and achieve smart city leisure, tourism environment, and sustainable development goals.

2. Literature Review

2.1. Under the Epidemic, the Importance of Intelligent Transportation System to the Construction of Green Leisure Environment and Sustainable Urban Development

Tourism is an economic industry with low costs and high benefits [47]. Despite the impact of the COVID-19 pandemic on the global tourism industry, countries are still actively developing domestic tourism markets and resources as the economy recovers [48]. However, the rise of the tourism industry also creates serious air pollution and damages the environment. Therefore, looking for low-polluting transportation measures to maintain the promotion of the tourism industry will be a future trend [30].

The smart tourism transportation system refers to the use of cloud technology combined with public transportation vehicles to provide the public with ticket booking, inquiries, and boarding needs [29]. Smart tourism transportation can effectively utilize transportation functions, reduce administrative resources and energy waste, and reduce energy consumption and pollution [49]. It is currently a hot topic, and countries are actively looking for alternative energy sources [50]. Governments all over the world expect to use this energy and vehicles to reduce energy consumption, reduce air pollution, and develop towards environmental sustainability [51]. However, there are often errors between the expected goals and actual results of decision planning [37], and it takes time to verify them [36]. Through the user's personal experience, and from the perspective of the value of facility experience, tourism involvement, satisfaction, and willingness to consume, they are provided with insights which can obtain the real situation and discover deficiencies [35–37]. The current studies focus on the development, industry, itinerary planning, and experience of the cloud tourism system. However, there is no discussion on the effect of intelligent transportation systems applied to urban tourism and the user's experience and perception. Therefore, we believe that the results of the case study may help revise the current decision-making dilemma and promote the establishment of a smart city in Binhai towards the goal of sustainable development, which is worth exploring.

2.2. Participating Intention

Participation willingness can be regarded as a consumption behavior, which is the possibility of people participating in, purchasing, using, or engaging in a leisure or tourism activity or commodity [52]. This reflects the public's perception of the product and the experience of the product, and reveals the individual's awareness of the willingness to use leisure or tourism activities and commodities [53]. The main intention of participation willingness in this study refers to the willingness and ambition of college students to use the intelligent transportation system to engage in leisure or tourism activities.

Some scholars have stated that the willingness to participate usually comes from the stages of public interest in a product or activity through word-of-mouth information inquiry, decision evaluation, product use behavior, and actual purchase and consumption [54]. When the public lacks information about leisure or tourism activities and products, they may use the information provided by the product information provider or the personal experience to evaluate the individual's demand for the use of products and their willingness to consume [55]. The willingness to participate usually results in the continuous participation of individuals, the willingness to share personal experience after using goods or activities, and the recommendation of leisure or tourism activities and products to relatives and friends for use [56]. Furthermore, there are differences in the cognition of consumption willingness of different genders [57].

Therefore, we believe that the theory of willingness to participate, from the perspectives of personal consumption awareness and communication attitudes towards activities and products, and an exploration of different gender variables may help us understand the willingness of college students to use the intelligent transportation systems to engage in leisure or tourism activities. These can also indirectly estimate the actual application effectiveness and design defects of the local smart transportation system.

2.3. Facility Experience Value and Participating Intention

Experience value refers to the feeling that consumers obtain physical or psychological personal experience from certain soft and hard facilities or commodities [58]. Tourism involvement refers to a psychological state that affects individuals in the decision-making process of participating in tourism due to internal and external interference factors [59], which is helpful for individuals to achieve valuable tourism plans. The experience value of this study referred to the consumer perception of college students after using the smart tourism and transportation APP system.

Some scholars have stated that the way of generating experiential value is based on the personal experience of facility goods or services transferred to the personal experience of a certain commodity or facility for comparison [60]. This can be measured in terms of logic, emotion, and practical experience [61], and it can also be judged in terms of education, aesthetics, and escapism [62]. Answers can be obtained by discussing topics such as integrity, attractiveness, design style, environmental awareness, environmental knowledge, and relaxation [63]. Furthermore, different backgrounds have different views on the experience value cognition of the same software and hardware facilities [64]. The higher the cognition of positive experience value, the stronger the willingness to consume or use tourism [65].

Therefore, we believe that based on the theory of experiential value; divided from the levels of education, aesthetics, and escapism; judged by issues such as design style, integrity, attractiveness, relaxation, environmental knowledge, and conservation awareness; and analyzed from different background perspectives, we can gain a better understanding of the real feelings of college students using the intelligent transportation system which provides insight into leisure and activity tourism activities.

2.4. Tourism Involvement and Participating Intention

Involvement is a personal inner experience, also known as perception [66]. Tourism involvement refers to a psychological state in which an individual is affected by internal and external factors, such as inner core values; continuity; and physical tourism environment or products, services, or communication, which affect the decision-making process of individuals participating in tourism [67]. This can help individuals reach valuable travel plans. The tourism involvement in this study refers to the degree of influence on personal tourism decision-making and planning when college students use the smart tourism transportation APP system to engage in tourism activities.

Some scholars have stated that tourism involvement is mainly due to individual tourism needs, interests, opinions, or the importance of tourism activities and continued investment and participation [68]. Some scholars believe that tourism involvement can be defined from human behavior and attitudes [46]. Usually, the consumption factor is derived from the core of personal needs, looking for products that can add personal characteristics and distinguish them [59]. Therefore, the discussion of tourism involvement can be extended from three aspects: personal core value (centrality), product attractiveness, and self-improvement [46,69]. The inner psychological state and the degree of correlation between external situations or stimuli can be used to understand the influence of the degree of involvement and subsequent development [70]. The influencing factors of the degree of involvement can be known from the aspects of participation and feelings, love and values, self-expression, self-confidence, and attention [71]. Moreover, the perception of tourism involvement in different backgrounds has different views [72], and the higher the degree of tourism involvement, the stronger the willingness to consume tourism-related commodities [73].

Therefore, we believe that the theory of tourism involvement can be classified into three aspects (centrality, attractiveness, and self-expression) to discuss issues such as self-expression, self-confidence, liking, values, participation, and feelings, as well as to attract attention. From different background perspectives, the degree of involvement of college

students in urban leisure and tourism activities using the smart transportation system can be understood.

2.5. *Tourism Satisfaction and Participating Intention*

Tourism satisfaction refers to the cognition finally generated by comparing personal tourism experience and actual environmental experience in the process of people engaging in leisure activities [74]. We think that tourism satisfaction perception is a positive view or feeling after a personal tourism experience. When the experience of the actual tourism environment or activity content conforms to personal expectations, the heart will be satisfied; otherwise, it will be dissatisfied [75]. The tourism involvement in this study refers to the personal experience of college students after using the smart tourism transportation APP system to engage in tourism activities.

Some scholars have stated that tourism satisfaction should be discussed from two aspects: internal and external, while others have stated that it should be distinguished from the aspects of physiology, psychology, education, aesthetics, social interaction, relaxation, education, and society [76]. The answers can be obtained with the personal favorite way to engage in travel, software that is important to travel activity planning, challenges, speeding up planning travel activities, knowledge increasing, knowing new things, meeting new friends, developing friendly relationships, feeling relaxed, emotional stability, open and transparent software information, and the well-planned operation interface. Moreover, different backgrounds have different views on the perception of tourism satisfaction in the disguised form [77]. The stronger the tourism satisfaction, the higher the willingness of tourism planning [78].

Therefore, we believe that according to the theory of tourism satisfaction, it can be classified from the aspects of physiology, psychology, education, aesthetics, social interaction, relaxation, education, and society [79]. The different issues can be analyzed using the personal favorite way to engage in travel, software that is important to travel activity planning, challenges, speeding up planning travel activities, knowledge increasing, knowing new things, meeting new friends, developing friendly relationships, feeling relaxed, emotional stability, open and transparent software information, and the well-planned operation interface. Then, the perception of tourism satisfaction in disguised form from different backgrounds can be discussed in order to gain a better understanding of the feelings of college students using the urban smart tourism transportation system to engage in tourism activities.

3. Methods

3.1. *Framework and Hypothesis*

The research took Fuzhou City, Fujian Province, China as the research scope, and investigated people's perceptions of the experience value, tourism involvement, satisfaction, and willingness to participate in the urban smart tourism transportation system. From the literature, the researchers developed a better understanding around the influence of the smart tourism transportation system on the city [19–25], as well as the development of the local smart tourism transportation system in Fuzhou and the current situation of the people's use [32–34]. Moreover, this understanding can then help in the exploration of potential problems, including the aspects of experience value, tourism involvement, satisfaction, and willingness to participate [52–77]. However, there are differences between the expected planning and the actual promotion of decision-making [36–38], and it will take time to verify this problem [37,38]. Although collecting the user's personal experience and feelings is important, the real answer to the event can be found [36–38,64,73,78,79]. If we can collect information from different background perspectives, use multiple research methods, and discuss with theories (such as experience value, tourism involvement, tourism satisfaction, and tourism intention), we can better understand answers in more depth. The research structure is shown in Figure 1.

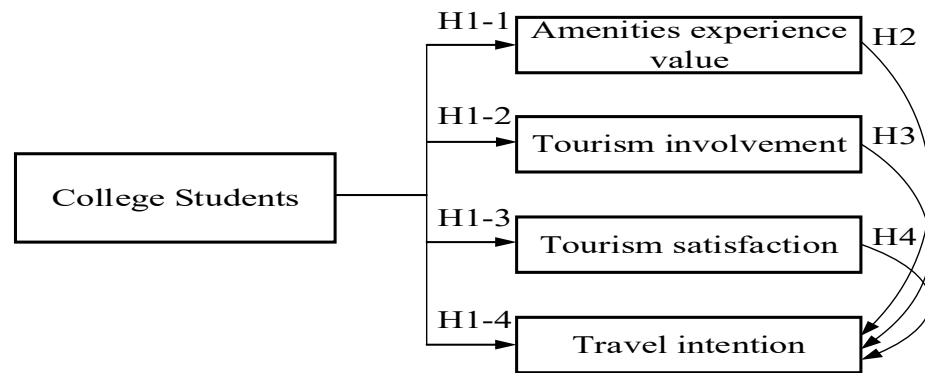


Figure 1. Study framework.

Based on the above literature and framework diagrams, this study proposed seven hypotheses.

Hypothesis 1 (H1). Assume that college students have consistent cognitions of the experience value of urban smart tourism transportation system, tourism involvement, tourism satisfaction, and willingness to participate in tourism.

Hypothesis 2 (H2). Assume that experience value and willingness to participate have a positive and significant impact.

Hypothesis 3 (H3). Assume that tourism involvement and willingness to participate have a positive and significant impact.

Hypothesis 4 (H4). Assume that tourism satisfaction and participation intention have a positive and significant effect.

3.2. Process and Methods

The research examined the development and actual effects of the urban smart tourism transportation system based on the perceptions of college students' experience value, tourism involvement, satisfaction, and willingness to participate. Although the research and development of related theories was quite mature, through the design of mixed research methods, quantitative research was used first to investigate [79,80], qualitative research was used to confirm [81], and finally, the multi-check method was used to obtain more in-depth answers [36–38,64,77–79].

Therefore, the research first referred to the relevant literature [37–62] to edit the questionnaire tool. First, three scholars with expertise in software application, tourism, and decision analysis conducted content validity checks and revised the first draft of the questionnaire. In July 2021, 100 questionnaires were collected, and SPSS 26.0 statistical software was used to verify the questionnaire tool and confirm the formal issues. From August to October 2021, 800 questionnaires were distributed, and 750 valid questionnaires were finally obtained, with a recovery rate of 93.75%. The questionnaires were analyzed by a basic statistics test, a t-test, ANOVA, and Pearson's product-moment correlation coefficient test (PPMCC). Then, the study used the semi-structured interview method to plan a purposeful and flexible way of talking and to obtain the opinions of experts and consumers based on the analysis results. We gathered all the data in a rigorous, orderly, and logical manner, and then summarized valuable information through summarizing, organizing, and arranging methods [82]. Finally, the analysis was carried out through the multi-check method in a multi-data and multi-perspective way [83,84].

3.3. Tools and Analysis

The questionnaire was divided into two parts. The first part was the basic background, software types, and frequency of use. Since men and women usually have different usage needs, we set gender options (male, female). At present, the public transportation connected by the smart transportation system is diverse. Bicycles, taxis, MRT, high-speed rail, and airplanes were all options. Therefore, we set the options of software types (electric bicycles, taxis, subways, high-speed trains, and airplanes). For people going out to use transportation for study, work, or leisure, the frequency of participation in the required activities varied, and we set the frequency of use options (rarely, occasionally, and often). The second part consisted of 31 questions regarding experience value, tourism involvement, tourism satisfaction, and tourism willingness, designed with a 5-point Likert scale (5 points represent very satisfied, 1 point represents very dissatisfied). The questionnaire was compiled in the relevant literature [58–80], and three experts were asked to check the content validity. Three invited users were willing to be interviewed to share their opinions on the results of the questionnaire analysis. The relevant background and interview topics are shown in Table 1.

Table 1. Respondent’s background information and an overview of the interview outline.

| Identity | Gender | Age or Years of Employment | Identity | Gender | Age or Years of Employment |
|-------------------------------|---|----------------------------|----------|--------|----------------------------|
| Information software | Male | 15 | Student | Male | 2 |
| Tourism analysis | Female | 28 | Student | Female | 3 |
| Decision analysis | Male | 22 | Student | Female | 4 |
| Construct | Issues | | | | |
| Impact of tourism development | 1. Please comment, how do you feel after using the urban smart travel transportation APP system? | | | | |
| | 2. Please evaluate college students’ use of the urban smart tourism transportation APP system to engage in tourism activities. What are the main reasons for their tourism involvement? Will it affect people’s willingness to participate in tourism activities? Please explain why. | | | | |
| | 3. Please comment on the use of the urban smart tourism transportation APP system by college students to engage in tourism activities? Please explain why. | | | | |
| | 4. Please comment on whether you are willing to use the urban smart tourism transportation APP system to engage in tourism activities? And what is hindering you? | | | | |

The quantitative questionnaire first used the Delphi method, and the content of the questionnaire was determined by the content validity check of scholars [85], and then the SPSS 26.0 statistical software was used to carry out statistical verification and measurement of reliability. The Kaiser–Meyer–Olkin (KMO) metrics compare simple and partial correlation coefficients between variables [86]. When the test results in Kaiser–Meyer–Olkin (KMO) >0.06, and the p -value in the Bartlett test was less than 0.01 ($p < 0.01$), the scale was suitable for continuous factor analysis [86]. α was mainly responsible for hypothesis testing. When the test question $p < 0.001$, the α value in this study was >0.3 (barely credible), >0.4 (credible), >0.5 (very credible), and >0.9 (very credible), which showed that the hypotheses were valid and could be adopted [87]. The issues with the test result α value greater than 0.60 represented good reliability [88], and their issues were used to continue the analysis. The follow-up was based on the order of experience value, tourism involvement, tourism satisfaction, and willingness to participate in the questionnaire analysis and discussion.

The experiential value questionnaire of the urban smart tourism transportation system was edited with reference to the literature [58–63], and there were 16 questions in this questionnaire. After analysis, KMO was 0.936, Bartlett’s approximate χ^2 value was 9476.15,

df was 120, and the significance was $p < 0.001$; the questionnaire was suitable for factor analysis. The amount of variance explained by the scale was 28.332%, 26.159%, and 20.315%, and the total amount of variance explained was 74.805%. After factor analysis, good and reliable issues were retained and named as aesthetic experience (6 questions), system quality (6 questions), and software experience value (4 questions). The α coefficients were 0.951–0.954, respectively, and the α coefficient of the total scale was 0.955. It could be seen that the experiential value questionnaire had good reliability.

Tourism involvement was edited regarding [64–73] literature, with nine questions. After analysis, KMO was 0.900, while Bartlett's approximate χ^2 value was 4950.754, df was 36, and the significance was $p < 0.001$, which was suitable for factor analysis. The amount of variance explained by the scale was 32.057%, 24.582%, and 24.198%, and the total amount of variance explained was 80.837%. After factor analysis, good and reliable topics were retained and named as attractiveness (2 questions), centrality (4 questions), and self-expression (3 questions). The α coefficients were 0.946–0.950, respectively, and the α coefficient of the total scale was 0.954. The tourism involvement questionnaire had good reliability.

Based on the literature [73–78], tourism satisfaction was edited with 12 questions. After analysis, KMO was found to be 0.941, while Bartlett's approximate χ^2 value was 5878.99, df was 66, and the significance was $p < 0.001$, which was suitable for factor analysis. The variance explained by the scale was 45.912%, 16.327%, 13.323%, 1.858%, 1.46%, and 1.033%, and the total explained variance was 79.912%. After factor analysis, good and reliable topics were retained and named as physiological (2 questions), psychology (2 questions), education (2 questions), social (2 questions), relaxation (2 questions), and aesthetics (2 questions). The α coefficients were 0.943–0.950, respectively, and the α coefficient of the total scale was 0.950. The tourism satisfaction questionnaire had good reliability.

The willingness to participate was edited regarding the literature [52–56], with 3 questions. KMO was 0.720, while Bartlett's approximate χ^2 value was 880.212, df was 3, and significance was $p < 0.001$, making it suitable for factor analysis. The total variance explained by the scale was 71.559%. After factor analysis, good and reliable topics were retained; the α coefficients ranged between 0.788 and 0.875, respectively; and the α coefficient of the total scale was 0.880. The willingness to consume the questionnaire had good reliability. The content of the questionnaire is shown in Table 2.

Table 2. Introduction to research tools.

| Facets | Subfactors | Issues |
|---|--------------------------|---|
| Gender | | male, female |
| Software Type Options | | electric bicycles, taxis, subways, high-speed trains, and airplanes |
| Frequency Options | | rarely, occasionally, and often |
| Facility and Environmental Experience Value | Aesthetic experience | the goods are comfortable, the design is creative, the consumer experience is happy, there is a desire to use other products, there is a need to improve social identity, there is a need to represent personal characteristics |
| | software system quality | navigation is clear, the system is stable, the information is clear, the information is reliable, online instructions, the system communication is smooth |
| | product experience value | it is great value for money, the description is detailed, the service experience is good, the choice is accurate |

Table 2. *Cont.*

| Facets | Subfactors | Issues |
|---------------------|---|--|
| Tourism Involvement | Attractivity | Important and dependent, very satisfying and fun |
| | Centrality | The tool is used to engage in tourism activities, take a big part in life, play an important role, topics for discussion and chats |
| | Self-expression | Friends also choose the same product, express one's own characteristics, normal natural behavior |
| Travel Satisfaction | Physiological factors | Heavy activity, like to engage in activities |
| | Psychological factors | Physically challenging, physical recovery |
| | Educational factors | Broaden horizons, learn new things through others |
| | Social factors | Meet new friends, develop friendly relationships |
| | Relaxation | Make me feel relaxed, stabilize my mood |
| | Aesthetics | Open and safe, well-planned |
| Happiness | Continuous consumption, share experience, recommend friends and relatives | |

3.4. Objects, Scope, and Limitations

This research took the urban smart tourism transportation system facilities as the theme and discussed the theories of experience value, tourism involvement, satisfaction, and willingness to participate [48–77]. It mainly investigated the experience of college students on the city's smart tourism transportation system and the degree of participation of individuals in tourism activities using this software.

Although the study firstly collected relevant literature for understanding and then used the convenience sampling method to collect questionnaires, it also used the online questionnaire platform and the snowball sampling method to entrust on-site respondents to recommend volunteers to participate in the research survey. In addition, a total of 6 respondents, including scholars with expertise in software application, tourism analysis, and decision analysis, as well as college students who volunteered to be interviewed, were invited. The interviewee's willingness to be interviewed was obtained using a mobile phone or computer video and communication systems. Then, a semi-structured interview was conducted to produce a survey and put forward opinions on the questionnaire analysis and results. A week of field research was obtained locally. After personal inspection and experience, all the data were compiled and discussed using a multi-check method.

4. Analysis

4.1. Background Analysis

A total of 750 questionnaires were obtained in the study. First, the basic background of the sample, the types of software, and the frequency of use of the samples were analyzed using descriptive statistics. The genders of the interviewed college students were mostly female (64.9%), with almost half the amount of males (35.1%). The most common software types were electric bicycles (54.3%), followed by taxis (40.4%), subway (2.1%), high-speed rail (1.7%), and airplanes (1.5%). The frequency of use was dominated by frequent users (71.3%), followed by occasional users (28.7%).

We can see that females represented the majority among all the samples tested by college students, and that the travel and transportation APP system of electric bicycles and taxis were the most commonly used types of all college students. The frequency of use was quite large. Therefore, we can see that the urban smart tourism and transportation APP system of electric bicycles became the choice of software and transportation tools for local college students to go out for life, leisure, and tourism activities.

4.2. Cognitive Analysis of Experience Value, Tourism Involvement, Tourism Satisfaction, and Consumption Willingness of Urban Smart Tourism Transportation System

According to the literature on experience value [58–63], tourism involvement [64–73], tourism satisfaction [62,63], and willingness to participate [52–56], the basic statistical test, the t-test method, the ANOVA test, and other methods were used to carry out, analyze, and verify the influence of college students on the experience value of urban smart tourism transportation system, tourism involvement, tourism satisfaction, and willingness to participate, and in line with research hypotheses 1–4. The data analysis of this chapter is presented in Table 3 at the end of the paper.

4.2.1. Cognition of Experience Value of Urban Smart Tourism Transportation System

According to the analysis, “clear information” (4.06), “detailed description” (4.05), and “wanting to use other products” (4.04) have the highest scores. At the same time, “the navigation function is clear” (3.92), “personal characteristics” (3.72), and “the price is excellent” (3.99) have the lowest.

Analysis of background cognition differences between different backgrounds, types of software, and frequency of use shows that gender has a significant impact ($p < 0.001$) in terms of price and value for money, i.e., males > females. In contrast, other issues have no significant difference. The software types are not significant ($p > 0.001$) in the options of system stability and clear information; however, all other items are significant ($p < 0.001$). Those who choose subway system software want to use other products. Furthermore, subway users believe that the facility has clear navigation functions and pleasant consumption experience, and that the system software can help improve social identity. Electric bicycle system users think the price is good value for money, whereas airplane system users think the service experience is good. The frequency of use is significant ($p < 0.001$) on issues, such as creative design, correct selection, desire to use other products, and frequently users > occasionally users, while other issues have no significant difference.

We can see that college students want to use other products because the information on the operating system is clear and detailed with the smart transportation system design. However, due to issues such as price and tour guide functions, it is impossible to fully carry out tourism activities and not represent personal characteristics. Furthermore, those who use it often think that the design is creative and the choice is accurate, and they want to use other products. Men are more likely to think that price setting is reasonable than women. Those who choose subway system software want to use other products. Furthermore, they believe that the facility has clear navigation functions and a pleasant consumption experience, and that the system software can help improve social identity. In contrast, the airplane system service experience is better.

4.2.2. Cognition of Tourism Involvement

According to the analysis, “people like to use this tool to engage in tourism activities” (4.10), “very satisfied and interesting” (4.07), and “normal and natural behavior” (4.03) have the highest scores, while “showing their own characteristics” (3.88), “a large part of life” (3.86), and “critical dependencies” (3.97) have the lowest.

Table 3. College students' cognition and cognition analysis of urban smart tourism transportation APP system experience value, tourism involvement, tourism satisfaction, and consumption willingness.

| Facets | Subfactors | Issues | M | SD | Rank | Gender | | Software Type | | | | | | Usage Frequency | | | | |
|---|---------------------------------|---|-------|-------|------|--------|--------|---------------|------------------|------|--------|-----------------|----------|--|--|--------------|------------|---------|
| | | | | | | Male | Female | p-Value | Electric Bicycle | Taxi | Subway | High-Speed Rail | Airplane | p-Value | Post Hoc | Occasionally | Frequently | p-Value |
| Facility and Environmental Experience Value | Aesthetic Experience | The goods are comfortable | 3.97 | 0.753 | 4 | 3.97 | 3.97 | 0.031 | 4.15 | 3.80 | 4.11 | 3.50 | 3.00 | 0.000 * | N.A | 3.25 | 4.03 | 0.021 |
| | | The design is creative | 3.98 | 0.810 | 3 | 4.06 | 3.93 | 0.929 | 4.14 | 3.83 | 4.56 | 3.00 | 2.91 | 0.000 * | N.A | 2.97 | 4.05 | 0.000 * |
| | | The consumer experience is happy | 4.03 | 0.789 | 2 | 3.97 | 4.06 | 0.006 | 4.18 | 3.88 | 4.56 | 2.50 | 3.64 | 0.000 * | Subway > electric bicycle, Taxi, High-speed rail, Airplane | 3.14 | 4.10 | 0.085 |
| | | Want to use other products | 4.04 | 0.790 | 1 | 4.09 | 4.01 | 0.002 | 4.18 | 3.89 | 4.44 | 3.00 | 3.55 | 0.000 * | Subway > electric bicycle, Taxi, High-speed rail | 3.33 | 4.09 | 0.000 * |
| | | Improving social identity | 3.92 | 0.889 | 5 | 3.98 | 3.88 | 0.010 | 4.14 | 3.70 | 4.11 | 3.50 | 2.55 | 0.000 * | Subway > electric bicycle, Taxi, Airplane | 3.03 | 3.98 | 0.003 |
| | | Representing personal characteristics | 3.72 | 1.01 | 6 | 3.86 | 3.64 | 0.037 | 3.93 | 3.52 | 4.11 | 2.50 | 2.36 | 0.000 * | N.A | 2.44 | 3.81 | 0.446 |
| | Software System Quality | Navigation is clear | 3.92 | 0.793 | 5 | 4.03 | 3.85 | 0.487 | 4.09 | 3.68 | 4.56 | 3.50 | 3.82 | 0.000 * | Subway > electric bicycle, Taxi | 3.33 | 3.96 | 0.827 |
| | | System is stable | 4.05 | 0.754 | 2 | 4.12 | 4.02 | 0.192 | 4.13 | 3.97 | 4.00 | 4.00 | 3.73 | 0.111 | N.A | 3.42 | 4.10 | 0.394 |
| | | Information is clear | 4.06 | 0.713 | 1 | 4.11 | 4.04 | 0.268 | 4.18 | 3.92 | 4.00 | 4.00 | 3.91 | 0.002 | N.A | 3.53 | 4.10 | 0.166 |
| | | Information is reliable | 4.04 | 0.734 | 3 | 4.09 | 4.01 | 0.093 | 4.16 | 3.93 | 4.00 | 3.50 | 3.73 | 0.001 * | N.A | 3.42 | 4.09 | 0.206 |
| | | Online instructions | 4.05 | 0.742 | 2 | 4.10 | 4.01 | 0.019 | 4.17 | 3.90 | 4.00 | 3.50 | 4.00 | 0.000 * | N.A | 3.42 | 4.09 | 0.154 |
| | System communication is smooth | 4.00 | 0.808 | 4 | 4.02 | 3.99 | 0.102 | 4.14 | 3.80 | 4.00 | 3.50 | 4.55 | 0.000 * | N.A | 3.50 | 4.03 | 0.013 | |
| | Product Experience Value | The value is great for money | 3.99 | 0.816 | 4 | 4.06 | 3.95 | 0.000 * | 4.08 | 3.83 | 4.56 | 3.50 | 4.45 | 0.000 * | electric bicycle > Taxi | 3.47 | 4.03 | 0.011 |
| | | The description is detailed | 4.05 | 0.840 | 1 | 3.97 | 4.10 | 0.142 | 4.18 | 3.92 | 4.56 | 3.00 | 3.91 | 0.000 * | Subway > electric bicycle, Taxi, High-speed rail | 3.39 | 4.10 | 0.052 |
| | | The service experience is good | 4.04 | 0.786 | 2 | 4.09 | 4.02 | 0.023 | 4.17 | 3.89 | 4.56 | 3.00 | 3.82 | 0.000 * | N.A | 3.17 | 4.11 | 0.158 |
| The choose is accurate | | 4.03 | 0.806 | 3 | 3.99 | 4.05 | 0.349 | 4.13 | 3.89 | 4.56 | 2.50 | 4.64 | 0.000 * | Airplane > electric bicycle, taxi, subway, high-speed rail | 3.50 | 4.06 | 0.000 * | |
| Tourism Involvement | Attractivity | Important and dependent | 3.97 | 0.909 | 2 | 4.13 | 3.88 | 0.008 | 4.15 | 3.71 | 5.00 | 4.00 | 4.27 | 0.000 * | N.A | 3.47 | 4.00 | 0.009 |
| | | Very satisfying and fun | 4.07 | 0.811 | 1 | 4.15 | 4.03 | 0.129 | 4.22 | 3.83 | 5.00 | 3.50 | 4.18 | 0.000 * | N.A | 3.81 | 4.09 | 0.000 * |
| | Centrality | Like to use this tool to engage in tourism activities | 4.10 | 0.813 | 1 | 4.14 | 4.08 | 0.467 | 4.23 | 3.89 | 5.00 | 3.00 | 4.55 | 0.000 * | N.A | 3.72 | 4.13 | 0.000 * |
| | | Take a big part in life | 3.86 | 0.995 | 4 | 4.08 | 3.75 | 0.000 * | 4.14 | 3.50 | 5.00 | 3.00 | 3.55 | 0.000 * | N.A | 3.00 | 3.93 | 0.003 |
| | | Play an important role | 3.94 | 0.924 | 3 | 4.10 | 3.85 | 0.000 * | 4.16 | 3.64 | 4.56 | 2.50 | 4.27 | 0.000 * | N.A | 3.22 | 3.99 | 0.034 |
| | | Topics for discussion and chats | 4.01 | 0.933 | 2 | 4.08 | 3.98 | 0.000 * | 4.19 | 3.77 | 4.56 | 2.50 | 4.64 | 0.000 * | N.A | 3.75 | 4.03 | 0.028 |
| | Self-expression | Friends also choose the same product | 4.00 | 0.939 | 2 | 4.03 | 3.99 | 0.140 | 4.23 | 3.74 | 4.11 | 2.50 | 4.09 | 0.000 * | N.A | 2.81 | 4.09 | 0.000 * |
| | | Express one's own characteristics | 3.88 | 0.899 | 3 | 4.05 | 3.79 | 0.000 * | 4.11 | 3.57 | 4.56 | 2.50 | 4.55 | 0.000 * | Subway > electric bicycle, taxi, high-speed rail, airplane | 3.39 | 3.92 | 0.008 |
| Normal natural behavior | 4.03 | 0.845 | 1 | 4.07 | 4.01 | 0.645 | 4.19 | 3.88 | 4.56 | 3.63 | 3.55 | 0.000 * | N.A | 2.86 | 4.12 | 0.000 * | | |
| Travel Satisfaction | Physiological factors | Heavy activity | 3.97 | 0.909 | 4 | 3.67 | 3.70 | 0.316 | 3.69 | 3.68 | 4.11 | 3.38 | 3.73 | 0.862 | N.A | 3.58 | 3.70 | 0.554 |
| | | Like to engage in activities | 4.07 | 0.811 | 1 | 3.81 | 3.75 | 0.328 | 3.83 | 3.70 | 4.22 | 3.50 | 3.64 | 0.365 | N.A | 3.64 | 3.78 | 0.731 |
| | Psychological factors | Physically challenging | 3.69 | 1.135 | 2 | 3.85 | 3.86 | 0.926 | 3.93 | 3.76 | 4.11 | 3.50 | 4.00 | 0.346 | N.A | 3.81 | 3.86 | 0.811 |
| | | Physical recovery | 3.77 | 1.111 | 1 | 3.91 | 3.92 | 0.898 | 3.87 | 3.96 | 4.33 | 3.88 | 4.09 | 0.421 | N.A | 3.89 | 3.91 | 0.607 |
| | Educational factors | Broaden horizons | 3.86 | 1.096 | 2 | 3.85 | 3.76 | 0.135 | 3.78 | 3.78 | 4.44 | 3.75 | 3.73 | 0.407 | N.A | 3.86 | 3.79 | 0.362 |
| | | Learn new things through others | 3.91 | 1.042 | 1 | 3.95 | 3.90 | 0.073 | 3.91 | 3.91 | 4.33 | 4.63 | 4.00 | 0.799 | N.A | 3.97 | 3.91 | 0.752 |
| | Social factors | Meet new friends | 3.79 | 1.003 | 2 | 3.87 | 3.89 | 0.416 | 3.95 | 3.75 | 4.11 | 4.75 | 4.09 | 0.101 | N.A | 4.08 | 3.87 | 0.271 |
| | | Develop friendly relationships | 3.92 | 1.068 | 1 | 3.88 | 3.97 | 0.262 | 4.02 | 3.75 | 4.22 | 3.38 | 4.55 | 0.006 | N.A | 4.19 | 3.92 | 0.180 |
| | Relaxation | Make me feel relaxed | 3.88 | 1.164 | 2 | 3.60 | 3.68 | 0.904 | 3.69 | 3.58 | 4.33 | 3.13 | 3.64 | 0.321 | N.A | 3.61 | 3.66 | 0.795 |
| | | Stabilize my mood | 3.94 | 1.158 | 1 | 3.73 | 3.76 | 0.527 | 3.79 | 3.70 | 4.33 | 3.38 | 3.82 | 0.212 | N.A | 3.58 | 3.76 | 0.024 |
| Aesthetics | Open and safe | 3.65 | 1.172 | 2 | 3.85 | 3.83 | 0.072 | 3.85 | 3.84 | 4.22 | 3.63 | 3.55 | 0.428 | N.A | 3.47 | 3.86 | 0.993 | |
| | Well-planned | 3.75 | 1.116 | 1 | 3.85 | 3.76 | 0.457 | 3.85 | 3.70 | 4.33 | 2.50 | 3.73 | 0.330 | N.A | 3.72 | 3.80 | 0.928 | |
| Happiness | Continuous consumption | 4.06 | 0.812 | 3 | 4.08 | 4.06 | 0.438 | 4.27 | 3.86 | 4.11 | 3.00 | 3.55 | 0.000 * | Electric bicycle > taxi, subway, high-speed rail | 3.03 | 4.14 | 0.994 | |
| | Share experience | 4.08 | 0.794 | 2 | 4.08 | 4.09 | 0.357 | 4.26 | 3.89 | 4.56 | 3.00 | 3.82 | 0.000 * | Subway > electric bicycle, taxi, high-speed rail | 3.28 | 4.14 | 0.007 | |
| | Recommend Friends and relatives | 4.14 | 0.870 | 1 | 4.11 | 4.16 | 0.004 | 4.28 | 3.98 | 4.56 | 3.00 | 4.18 | 0.000 * | N.A | 3.22 | 4.21 | 0.000 * | |

* $p < 0.001$.

Then, the background cognitive differences between different backgrounds, software types, and usage frequencies were analyzed. This revealed that gender accounts for a large part of life, plays an important role in discussing chat topics, and can express one's own characteristics, and that other topics are significant ($p < 0.001$), while other topics have no significant difference, i.e., male > female. The type of system is significant in every topic involved in tourism ($p < 0.001$), and those who use the subway system are more obvious in expressing their own characteristics, while there is no significant difference in other topics. Different frequencies are significant ($p < 0.001$) in topics such as being very satisfied and interesting, like to use this tool to engage in travel activities, friends also choose the same body selection software, and normal and natural behaviors ($p < 0.001$). Furthermore, "Frequently" is more significant than "Occasionally", while other topics have no significant difference.

We can see that college students think that it is normal and natural behavior to use the intelligent transportation system to engage in tourism activities, which is very satisfying and interesting, and they like to use this tool to engage in tourism activities. However, using related systems to engage in tourism cannot express its own characteristics, and it is not an important tool for tourism activities. Furthermore, users frequently think that using the urban smart tourism transportation system to engage in tourism activities is satisfying and interesting, and they like to use this tool to engage in tourism activities. "Friends also choose the same software" is a normal and natural behavior. Men think that it is the most important basis and role in tourism activities and life, and it is also a topic for friends to discuss, which can better express their own characteristics. Those who apply the subway system think they can express their own characteristics.

4.2.3. Cognition of Tourism Satisfaction

The analysis shows that "people who like to engage in activities" (4.07), "restore physical strength" (3.77), "learn new things through others" (3.91), "develop friendly relationships" (3.92), "can stabilize my mood" (3.94), and "plan well" (3.75) have higher scores. "Actively engaged" (3.97), "physically challenging" (3.69), "broadening knowledge" (3.86), "meeting new people" (3.79), "making me feel relaxed" (3.88), and "being open and safe" (3.65) have the lowest.

Then, the background cognition differences of different backgrounds, software types, and usage frequencies were analyzed, revealing that genders, system types, and different frequencies are not significant on all topics of tourism satisfaction ($p > 0.001$).

We can see that college students believe that the urban smart transportation system to assist tourism activities is well planned, and students can use this to understand new things, develop friendly relationships, restore physical strength, and stabilize emotions. However, this does not guarantee that they will expand their knowledge during the process or make new friends, and it does not remove doubts about health and safety. Physical fitness is challenging, students may not feel relaxed, and it is not their favorite way to engage in tourism activities. There are no differences in the perceptions of the results among different genders, types of systems, and different frequencies.

4.2.4. Cognition of Willingness to Participate

The analysis shows that the topic of recommending relatives and friends (4.14) has the highest score, and the continuous consumption (4.06) has a lower score.

Then, the background cognitive differences between different backgrounds, software types, and usage frequencies were analyzed. This shows that the types of systems have shown significant differences in topics such as continuous participation, sharing experience, and recommending relatives and friends ($p < 0.001$). Among them, users of the electric bicycle system have the highest awareness of continuous consumption, and users of the subway system have the highest awareness of sharing experience. Different frequencies have shown significant differences in recommending relatives and friends ($p < 0.001$), and frequently users have better feelings. There are no cognitive differences between genders.

We can see that after using the smart transportation system to engage in leisure or tourism activities, most college students recommend them to relatives and friends to inquire about transportation vehicle information when they engage in leisure or tourism activities in the future. However, they may not necessarily continue to use smart transportation systems for leisure or tourism activities. Among them, users of the electric bicycle system have the highest awareness of continuous consumption, and users of the subway system have the highest awareness of sharing experience. Frequent users have better feelings; there is little difference in cognition between genders.

4.3. Correlation Analysis of Experience Value, Tourism Involvement, Tourism Satisfaction, and Participation Willingness

Participation willingness is based on personal experience of the product and the corresponding effect of the product, and finally predicts the public's attitude towards the use of the product or commodity [19–36]. The literature points out that experience value, leisure involvement, and cognition of leisure satisfaction will affect the willingness to participate [68,69,73,77]. However, there are still errors between decision-making results and actual results, and it needs time and experiencers to verify this [37–39]. Therefore, we believe that experience value, leisure involvement, leisure satisfaction, and cognition of willingness to participate are positively correlated; thus, hypotheses 5 to 7 are valid. The PPMCC test method was used for analysis and verification. The data analysis of this chapter is presented in Tables 4 and 5 at the end of the paper.

Table 4. Correlation analysis of experience value, tourism involvement, and consumption intention cognition.

| | Aesthetic Experience | Information System Quality | Product Experience | Experience Value (Overall) | Attractive | Centrality | Self-Expression | Tourism Involvement (Overall) |
|----------------------------------|----------------------|----------------------------|--------------------|----------------------------|------------|------------|-----------------|-------------------------------|
| Continuous Consumption | 0.673 ** | 0.803 ** | 0.848 ** | 0.833 ** | 0.673 ** | 0.707 ** | 0.779 ** | 0.923 ** |
| Share experience | 0.731 ** | 0.756 ** | 0.760 ** | 0.793 ** | 0.707 ** | 0.756 ** | 0.640 ** | 0.866 ** |
| Recommend friends and relatives | 0.619 ** | 0.700 ** | 0.838 ** | 0.770 ** | 0.779 ** | 0.640 ** | 0.838 ** | 0.904 ** |
| Willingness to consume (overall) | 0.749 ** | 0.837 ** | 0.909 ** | 0.889 ** | 0.923 ** | 0.866 ** | 0.904 ** | 0.889 ** |

** $p < 0.001$.

Table 5. Correlation analysis of tourism satisfaction and consumption intention cognition.

| | Physiological Factors | Psychological Factors | Educational Factors | Social Factors | Relaxation | Aesthetics | Tourist Satisfaction (Overall) |
|----------------------------------|-----------------------|-----------------------|---------------------|----------------|------------|------------|--------------------------------|
| Continuous Consumption | −0.023 | −0.044 | −0.018 | 0.092 * | −0.045 | −0.021 | −0.010 |
| Share Experience | 0.076 | 0.042 | 0.037 | 0.149 ** | 0.051 | 0.058 | 0.082 |
| Recommend Friends and Relatives | −0.022 | −0.041 | −0.029 | 0.031 | −0.038 | −0.012 | −0.021 |
| Willingness to Consume (Overall) | 0.011 | −0.017 | −0.005 | 0.099* | −0.013 | 0.008 | 0.017 |

* $p < 0.05$, ** $p < 0.001$.

The analysis suggests that the overall experience value, leisure involvement cognition, and willingness to participate are positively significant ($p < 0.001$); however, the overall leisure satisfaction cognition is not significant ($p > 0.001$).

The analysis has found that commodity experience of experiential value has a positive effect on continuous participation, sharing experience, and recommending relatives and friends. Furthermore, self-expression of leisure involvement has a positive effect on continuous participation, recommending relatives and friends, and centrality related to sharing

experience, and social satisfaction of leisure has a significant positive effect on continuous participation and sharing experience ($p < 0.001$).

We can see that the experience value of the urban smart transportation system and the awareness of leisure involvement of college students will affect the willingness to travel. The willingness to continue to participate is the most significant, especially regarding product experience, centrality, and social influence. Commodity experience, centrality, and social influence have the greatest effect on sharing experience. Commodity experience and leisure involvement have the greatest impact on the willingness to recommend relatives and friends.

4.4. Discussions

4.4.1. Experience Value

The Chinese local government has used the Internet and AI systems to introduce the transportation system and constructed domestic airports for many years, as well as MRT, high-speed rail, buses, shared bicycles, and other smart transportation consumption models, effectively improving the current situation of public transportation and improving people's convenience [16–18]. With the long-term round-trip transportation needs of college students, the convenience of system management and monitoring, and the rapid flow of consumer information, college students think that the design of urban smart transportation systems should be clear and detailed, or they may want to use other commodities.

Although the system and facilities are closely intertwined with coastal cities, the system provides meticulous and convenient transportation services to solve the long-distance travel problems of most college students. However, the peak passenger load is high, the security check time is too long, the login system is cumbersome, and the connectivity of related facilities is low, resulting in a poor ride experience. Some operating software interfaces of smart transportation cannot be connected with leisure and tourism-related industries. As a result, college students believe that using an urban smart tourism transportation system cannot represent personal characteristics. Therefore, the results of the study have found that most people's perceptions of the value of facility experience are inconsistent, which is inconsistent with the literature [16–18]. Therefore, the research Hypothesis 1 is not valid.

Although the number of subway trains is large, the fares are cheaper for people, and many domestic flights and various ticketing systems support each other. However, the real-name system is required to log in to various booking systems, which is quite inconvenient for college students who are not of Chinese nationality or who are only staying for a short period of time. Airfare is high, and most college students cannot afford it. During the peak period, it is difficult to obtain a ticket for high-speed rail facilities, and even station tickets can only be purchased at the same price, which negatively impacts female college students' experience of the facilities. As a result, the frequent users think the design is creative, and they may want to choose the right one as well as other goods. Men are more likely than women to think that price setting is reasonable. Those who choose subway system software believe that the facility has clear navigation functions, and they have a pleasant consumption experience. In addition, they want to use other products, and have a higher social identity when they use the system. In contrast, the airplane system service experience is better.

4.4.2. Tourism Involvement

Although the smart transportation system can apply the urban smart transportation system in the purchase, sale, use, experience, and other services of public transportation vehicles, taxis, and shared bicycles [20,21], it provides Chinese college students with application in learning, to engage in leisure, recreation, or tourism activities for many years [35]. Moreover, it has become the main choice and living habit of round-trip transportation. As a result, college students think that it is normal and natural behavior to use the urban

smart tourism transportation system to engage in leisure activities. It is very satisfying and interesting, and students like to use this tool to engage in tourism activities.

Due to the local promotion of the urban smart tourism transportation system for many years, Chinese college students are quite proficient in operating systems and using facilities. There are also transportation facilities, such as personal bicycles and taxis, which can be used for short-distance transportation. Therefore, most college students do not think that using the relevant system to engage in leisure can express their characteristics, nor is it a necessary choice. Therefore, the results of the study are inconsistent with the literature [20,21,35]. Therefore, the results of the study have found that most people's feelings of tourism involvement are not consistent, which is inconsistent with the literature [20,21,35]. Therefore, the research hypotheses 1–2 are not valid.

Although the smart tourism transportation system has been established for a long time, the construction is perfect, the MRT routes are widely distributed, and there are many boarding points. Chinese college students have used it frequently. However, booking tickets for most public transportation systems is difficult, too many riders can make it crowded, and female college students can easily be made to feel uncomfortable. As a result, college students who use the smart transportation system often think it is satisfying and interesting to use the intelligent transportation system to engage in tourism activities, and they like to use this tool to engage in tourism activities. Male college students believe that it is the most important basis and role for engaging in tourism activities and life, and it is also a topic for friends to discuss, which can better express their own characteristics. Thus, those who apply the subway system think that they can express their own characteristics.

4.4.3. Tourism Satisfaction

Various countries have used cloud technology in the leisure, tourism industry, and activities for many years. The development and application of the current intelligent transportation system [41] and the effect of linking software systems with the development of related industries have had many years of successful experience [42]. China has tapped a large number of foreign high-tech talents, cultivated domestic manpower, and borrowed the country's scientific and technological experience, and the technology and technology of domestic urban smart transportation systems have gradually become stable and mature. These moves not only improve the convenience of people's life, leisure, and travel but also provide college students with time-saving, money-saving, safe, and convenient transportation vehicles. Therefore, it is an opportunity to participate in leisure and tourism activities with companions. Most college students believe that the smart urban tourism transportation system can effectively assist the planning of tourism activities and transportation, and they can use this to learn new things, develop friendly relationships, restore physical strength, and stabilize emotions.

Due to the fact that some public transportation booking systems are not able to identify the number of vacant seats and the number of passengers is large, there are still people who are unwilling to cooperate with wearing masks. Therefore, regarding the ride experience from a college student point of view, personal health and physical fitness are very challenging, there are doubts about hygiene and safety, it is difficult to relax, and it does not guarantee improved knowledge or new friends; therefore, it is not the best choice. Therefore, most college students believe that experiencing the urban smart transportation system will cause doubts about personal physical fitness, health, and safety, and they cannot relax, improve their awareness, or make friends. Moreover, there is little difference in the opinions of different genders, types of systems, and different frequencies within their results. Therefore, the results of the study have found that most people's feelings of tourism satisfaction are not consistent, which is inconsistent with the literature [41,42]. Therefore, the research hypotheses 1–3 are not valid.

4.4.4. Willingness to Participate

Although the smart transportation system is for college students who lack funds and transportation, it can meet the needs of round-trip transportation for study, entertainment, leisure, tourism, and other life [19–21]. This is enough to make experienced college students provide others with new options for visiting transportation when they are engaged in leisure or tourism activities in the future. Therefore, most college students believe that after using the smart transportation system to engage in leisure or tourism activities, they recommend them to their relatives and friends to engage in leisure or tourism activities in the future.

Due to the increase in similar software systems, by providing the public with more choices of transportation inquiry software under the influence of the epidemic, public transportation has uncertain factors such as infection risk, which can reduce the willingness of people to continue using smart transportation systems for leisure or tourism activities. As a result, most universities are less willing to take or use smart transportation systems for leisure or tourism activities.

Although many MRT trains and few college students can afford air tickets as round-trip transportation, the service is of high quality. In addition, the pandemic has not yet ended, and individuals are at high risk of infection when taking public transportation. Therefore, users of the electric bicycle system have the highest awareness of continuous consumption. Subway system users have the highest awareness of sharing experience, while frequently users have better feelings. Therefore, the results of the study have found that most people's feelings of tourism satisfaction are not consistent, which is inconsistent with the literature [19–21]. Therefore, the research hypotheses 1–4 are not valid.

4.4.5. Correlation Analysis of Experience Value, Tourism Involvement, Tourism Satisfaction, and Participation Willingness

By using systems to introduce local green, smart tourism, and transportation systems (such as the Internet and AI), and to construct smart transportation consumption models (such as domestic airports), MRT, high-speed rail, buses, and shared bicycles can effectively improve the current situation of public transportation as well as the convenience of people's lives and transportation [32–34]. As a result, after experiencing the urban smart tourism transportation system, most college students have gained positive experience value of facilities and awareness of tourism involvement, and their willingness to continue to consume has increased. Therefore, experience value, tourism involvement cognition, and participation willingness are positively correlated.

Although there are many types of urban smart transportation facilities, the number of trains or cars is large, and some of the system information queries and ticket booking are inconvenient. In the process of use, there is a lack of leisure and tourism-related link information; some public transport passengers have a large capacity and few seats; and there are still a small number of people who are unwilling to wear masks, who talk loudly, or who litter, thus increasing the risk of travel. Therefore, there is no correlation between tourism satisfaction and consumption intention. Furthermore, continuous participation and sharing experience are most affected by product experience, centrality, and social interaction, while referring to relatives and friends is most affected by product experience and travel involvement. Therefore, the research results have found that experience value, tourism involvement, and tourism intention appear to be positively correlated, which is consistent with the literature [65,73]. Therefore, research Hypotheses 2–3 are valid. However, there is no significant difference between tourism satisfaction and tourism intention, which is inconsistent with the literature [78]. Therefore, research Hypothesis 4 is not valid.

4.5. Strategic Models of City Using Intelligent Transportation System to Promote Tourism Activities

The study has found that the current intelligent transportation system in the case has many types of transportation facilities, and the booking operation is convenient, which can promote urban transportation planning and leisure planning among students, as well as the convenience of participating in tourism activities.

To improve the facility experience, we suggest improving the system login methods of various smart transportation facilities, adjusting the fares, providing a reserved area or seats for female college students, and searching for information on leisure and tourism-related theme pages to improve the deficiencies of the current facilities.

To improve the tourism involvement, we suggest that adjusting the ticketing service method of the smart transportation system, providing exclusive female student passenger compartments, providing train passenger flow query information, and separating the crowds could improve the inadequacies of the current facilities.

To improve tourism satisfaction, we suggest that adjusting the ticketing service method of the smart transportation system, providing exclusive female student passenger compartments, providing train passenger flow query information, and separating the crowds could improve the inadequacies of the current facilities.

To promote tourism intention, we suggest that strengthening the publicity of epidemic prevention measures, improving the environmental and sanitation literacy of the Chinese people, and strengthening the cooperation of public transportation passengers with personal epidemic prevention measures could improve the current problems and enhance the sense of security of college students taking public transportation.

We believe that if the local area continues to maintain good decision-making, but improves the lack of existing operating systems, combines information related to leisure and tourism activities, maintains a safe and hygienic space, and improves the perception of facility experience, satisfaction and tourism willingness can be improved. The results of the logical analysis of the study are illustrated in Figure 2.

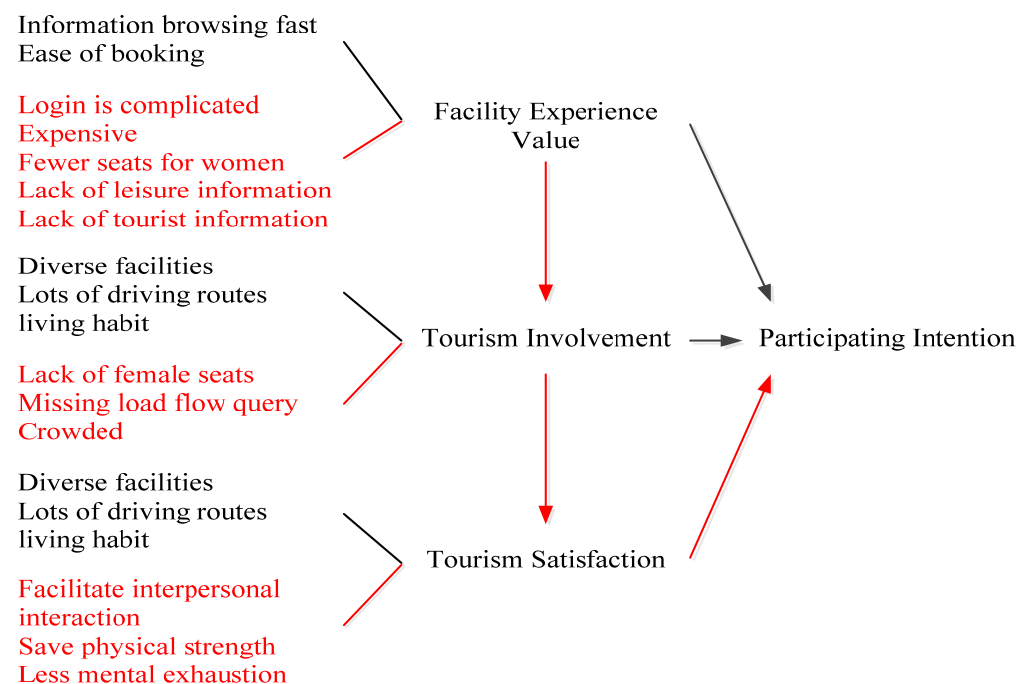


Figure 2. Strategic models of cities using intelligent transportation systems to promote tourism activities.

5. Conclusions and Suggestions

The study has found that due to the diverse selection of transportation facilities in the intelligent transportation system, it is convenient to book tickets, promote urban transportation planning, and improve the convenience of students' participation in leisure and tourism activities. However, during the peak period of the system, due to the large flow of people, long security check time, cumbersome login system, different fares, fewer seats and limited space for women, less travel information, low connectivity between travel and other transportation systems, and the real-name system requires, the software is not designed for use by local students or foreigners. In addition, during the experience, due to overcrowded people, a lack of seats, poor hygiene habits and epidemic prevention literacy, and safety concerns, the experience value, travel involvement, and travel satisfaction are low, affecting people's willingness to travel again.

5.1. For Decision-Making and Facilities

Based on the above results, we recommend increasing the publicity of pandemic prevention in public transport facilities, improving the pandemic prevention and control mechanism, increasing the crowd identification system for transportation vehicles, planning the ticket booking mechanism and boarding space for women, and improving the operation method and the convenience of the operating system for overseas college students may improve the system service quality.

5.2. For Passengers and College Students

We also suggest increasing personal hygiene and environmental literacy, improving cooperation with pandemic prevention measures (such as wearing masks), reducing the volume of calls on public transportation, and lowering the volume or using earphones for calls may improve the quality of the ride.

5.3. For Future Research

According to the structure and logic of this research, the researchers believe that conducting surveys in different regions and countries; investigating the perceptions of objects of different ages and identities; and verifying with different topics, perspectives, or research methods may fill the research gaps.

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