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Analyzing Student Satisfaction with Synchronous E-Learning on Robotic Process Automation Application for Finance in Guangdong, China

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Abstract

Purpose: This study aims to investigate student satisfaction with synchronous E-learning on robotic process automation (RPA) application for finance in Guangdong, China. **Research design, data, and methodology:** This study employed the Instrumental Organizational Culture (IOC) tool to assess effectiveness, with Cronbach's α coefficient used for reliability (n=30). Multiple Linear Regression (MLR) analysis was conducted on valid questionnaires from 80 students at the School of Accounting, Zhanjiang University of Science and Technology to confirm significant relationships between variables. Following this, a 16-week strategic plan involving 30 students was implemented. Quantitative data from the current and expected situations were compared using paired-sample t-tests. **Results:** Statistical validation confirmed the hypotheses regarding the correlation between course design quality, instructor attributes, interactive attributes, perceived usefulness, perceived ease of use, and student satisfaction. The research findings demonstrate significant changes in both current and expected variables. **Conclusions:** The course design quality, instructor attributes, interactive attributes, perceived usefulness, and perceived ease of use are critical factors affecting student satisfaction with synchronous E-learning on the RPA financial robot application course offered by the School of Accounting, Zhanjiang University of Science and Technology.

Keywords: Course Design Quality, Instructor Attributes, Interactive Attributes, Perceived Usefulness, Perceived Ease of Use, Student Satisfaction

JEL Classification Code: I23, J28, L2

1. Introduction

Synchronous E-learning refers to real-time network teaching and learning conducted in virtual classrooms via computer internet or mobile wireless networks. It aims to overcome the spatial limitations between teachers and students, establish a sense of presence, and replicate the traditional classroom teaching experience. In early 2020, the COVID-19 pandemic swept across the globe, with many countries implementing nationwide lockdown measures that prohibited large-scale face-to-face gatherings and affected various schools (Nikou & Maslov, 2023). In response, the Chinese government mandated the suspension of large-scale face-to-face gatherings to curb virus transmission, prompting schools to adopt alternative teaching methods while ensuring uninterrupted learning. According to the National Online Teaching Status and Quality Analysis Report, universities nationwide adopted various forms of online teaching, with synchronous E-learning accounting for over half, approximately 54% (Xie et al., 2020).

Despite its growing popularity, synchronous E-learning encounters several challenges. Firstly, many teachers need to be familiar with live online broadcasting platforms, which results in lecture-based teaching, limited interaction, and low student engagement. Secondly, insufficient awareness of remote interaction and ineffective organization result in limited communication between teachers and students. Thirdly, although synchronous E-learning emphasizes student autonomy, the separation between teachers and students can lead to feelings of loneliness and limited

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attention, self-control, and independent learning abilities among students, resulting in fatigue, low interest, and reduced satisfaction. Given these challenges and the widespread use of Robotic Process Automation (RPA) or financial robots in business, this study focuses on the satisfaction level of students enrolled in the RPA financial robot application course at the School of Accounting, Zhanjiang University of Science and Technology. It aims to explore the factors influencing student satisfaction with synchronous E-learning.

2. Literature Review

2.1 Student Satisfaction

Summarizing the definitions provided by previous scholars, student satisfaction is conceptualized as a psychological construct rooted in the assessment of needs and expectations (Yang et al., 2003; Vyas & Shirur, 2022). In this study, student satisfaction pertains to how students are content with educational institutions, schools, teaching content, teaching methods, instructors, and learning experiences, particularly concerning the synchronous E-learning on the RPA financial robot application course.

By drawing on the extensive body of literature, this study aims to construct a practical framework model that revolves around students. It integrates five key variables: course design quality, instructor attributes, interactive attributes, perceived usefulness, and perceived ease of use, to explore their connections with student satisfaction. The study's findings are expected to have significant implications for the design and delivery of synchronous E-learning on RPA financial robot application courses, thereby enhancing student satisfaction and learning outcomes.

2.2 Course Design Quality

The course design quality is pivotal in online teaching and learning, profoundly shaping the overall quality of instruction. Effective practices such as establishing clear objectives, crafting relevant content, organizing teaching methods, and providing practical teaching experiences significantly enhance teaching quality. According to Peng (2023), exemplary course designs should encompass clear teaching approaches, innovative methods, abundant teaching materials, well-structured instructional segments, appropriate assessment methods, and diverse learning activities.

Exceptional course design directly impacts students' learning experiences and satisfaction in various ways. Firstly, it ensures the clarity of learning objectives, aligning them with subject standards and student needs. This alignment facilitates students in achieving intended learning outcomes, thereby heightening their satisfaction with the course (Liang et al., 2023). Secondly, outstanding course design caters to diverse learning interests and styles by offering varied teaching content and methods. This adaptable approach engages students with the course content and adjusts instructional methods to suit their learning preferences, thus further bolstering student satisfaction (Huang et al., 2011). Moreover, effective assessment, feedback mechanisms, and a positive learning environment increase student satisfaction (Cai & Zhao, 2023; Lü, 2020; Zhao, 2020).

H1: Course design quality has a significant impact on student satisfaction with synchronous E-learning.

2.3 Instructor Attributes

Scholars suggest that instructor attributes encompass qualities and characteristics that influence their effectiveness in the classroom (Raza & Irfan, 2018). These attributes may include teacher personality, teaching style, student development, professional commitment, self-efficacy, values, organizational commitment, knowledge, teaching capabilities, personal traits, and social skills.

In the field of education, exploring the relationship between instructor attributes and student satisfaction is a crucial area of study. Research findings on the association between various teacher attributes and student satisfaction vary. Özgüngör and Duru (2015) found a positive link between instructor attributes and student satisfaction. Utilizing a combination of quantitative and qualitative methods, they identified characteristics of teachers and courses that received the highest and lowest student ratings in a Turkish university setting. Results indicated that teaching skills, teacher-student relationships, knowledge, and expertise were significant attributes of teachers who received the highest ratings. These attributes directly influenced students' learning outcomes and motivation, ensuring accurate knowledge transmission and deep understanding, thereby enhancing teaching quality and student satisfaction. However, it's important to note that some studies suggest a potential negative correlation between instructor attributes and student satisfaction. For instance, a negative relationship was observed between teachers' coercive communication and student satisfaction, with the credibility of the teacher acting as a mediator (Sidelinger & Bolen, 2016). This implies that teachers' communication styles and traits may impact student satisfaction, particularly when communication is overly coercive, potentially leading to adverse effects on satisfaction.

H2: Instructor attributes have a significant impact on student satisfaction with synchronous E-learning.

2.4 Interactive Attributes

Doyle (1986) is credited with introducing the concept of classroom ecosystems, which views the classroom as an organic system where teachers and students mutually influence and interact, thereby forming the classroom ecosystem. This concept underscores the importance of interactive attributes in designing instructional elements within this ecosystem (Lim et al., 2011).

Research suggests that interactivity, especially the level of teacher-student interaction, is vital in enhancing learning outcomes (Kobayashi, 2019). Positive interaction facilitates deeper understanding and retention of learned knowledge among students while promoting active learning (Sturmey et al., 2015). Interactive teaching methods, such as peer learning and collaborative teamwork, increase student engagement, improve learning effectiveness, and enhance the overall learning experience (Aggarwal, 2016). Additionally, positive interaction allows teachers to gain real-time insights into students' learning progress. It enables them to tailor teaching content and methods to meet diverse student needs, thus promoting deeper learning and increasing student satisfaction.

However, some studies suggest that certain aspects of teaching interaction may be negatively associated with student satisfaction (Sidelinger & Bolen, 2016). Nonetheless, the interactive attributes of teachers may not directly correlate with student satisfaction (Sturmey et al., 2015).

H3: Interactive attributes have a significant impact on student satisfaction with synchronous E-learning.

2.5 Perceived Usefulness

"Perceived usefulness" refers to an individual's perception and experience of the utility of certain information, technology, or systems. In an educational context, it pertains to students' perception and experience of the utility of instructional activities, teaching resources, or teaching methods (Yang, 2016). It focuses on students' cognitive assessment of instructional content and the learning environment. In this study, perceived usefulness denotes students' evaluation of the value and effectiveness of instructional content, teaching methods, or teaching resources in the learning process.

Researchers have explored the close relationship between perceived usefulness and student satisfaction. The Expectation-Confirmation Model (ECM) proposed by Bhattacherjee (2001) has investigated this relationship theoretically. It has been established that perceived usefulness is significantly and positively correlated with satisfaction, indirectly influencing users' intention to continue using a system through its positive impact on satisfaction. The revised Technology Acceptance Model (TAM), a widely used framework in research, has furthered our understanding of this relationship. Using the revised TAM, Qiang (2013) found a significant positive correlation between perceived usefulness and users' intention to continue using. Additionally, Mei et al. (2019) identified a positive correlation between university students' perceived usefulness in MOOC courses and their academic performance, employing the TAM framework.

H4: Perceived usefulness has a significant impact on student satisfaction with synchronous E-learning.

2.6 Perceived Ease of Use

Perceived Ease of Use (PEOU) refers to users' perception of the simplicity of operating a system (Davis et al., 1989). In an educational setting, it relates to students' subjective assessments of the ease of use of instructional processes, resources, tools, and learning environments (Liu et al., 2015). According to Barat et al. (2009), "Perceived Ease of Use" is the perception of a technology's usability in an educational environment.

In the field of information technology education, the research underscores the profound significance of perceived ease of use and perceived usefulness in influencing users' intention to continue using a technology. Liu et al. (2010) conducted a technology acceptance analysis to validate how learners' perceptions of the usefulness and ease of use of e-Learning impact their intention to use it. Similarly, Nicholas et al. (2021) suggested that educators' attitudes and intentions toward mobile applications may be shaped by their perceptions of the practicality and ease of use of mobile technology in classroom contexts.

Regarding teaching effectiveness, research indicates a direct relationship between perceived ease of use and teaching outcomes. Liaw (2008) found a positive association between learners' perceived usefulness and their motivation and learning achievements. Additionally, studies by Adobor and Daneshfar (2006) and Liaw (2008) have demonstrated a positive correlation between perceived ease of use and positive learning outcomes.

H5: Perceived ease of use has a significant impact on student satisfaction with synchronous E-learning.

3. Research Methods and Materials

3.1 Research Framework

The researcher applied three model theories from Cheng (2020), Daultani et al. (2021), and Gashi et al. (2021). All three theoretical frameworks above supported and developed the conceptual framework in Figure 1.

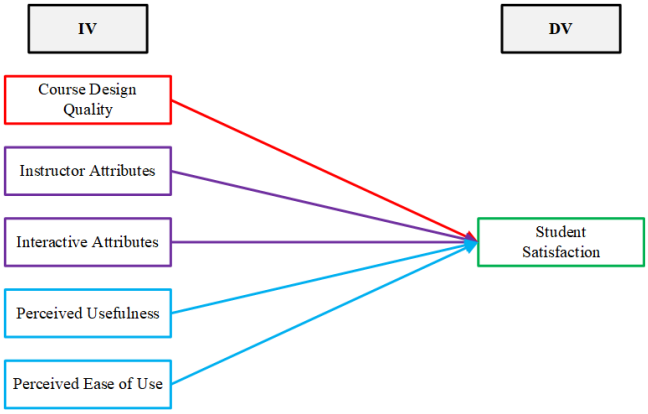

Figure 1: Conceptual Framework

H1: Course design quality has a significant impact on student satisfaction with synchronous E-learning.
H2: Instructor attributes have a significant impact on student satisfaction with synchronous E-learning.
H3: Interactive attributes have a significant impact on student satisfaction with synchronous E-learning.
H4: Perceived usefulness has a significant impact on student satisfaction with synchronous E-learning.
H5: Perceived ease of use has a significant impact on student satisfaction with synchronous E-learning.

3.2 Research Methodology

The study consisted of four distinct stages. Firstly, a survey was administered to the entire research population (n=80). Subsequently, based on the survey data, multiple linear regression analysis was conducted to assess the support for the hypotheses at a significance level of 95%. In the second stage, a current situation survey was carried out among the 80 students. The third stage entailed executing the strategic plan, with 30 students participating. Finally, the fourth stage involved an expected situation survey, where questionnaires were administered to the 30 students involved in the strategic plan. The data collected underwent paired-sample t-tests to compare the results between the current and expected situations.

3.3 Research Population, Sample Size, and Sampling Procedures

3.3.1 Research Population

This study's research subjects consist of students from the School of Accounting, Zhanjiang University of Science and Technology, who are currently enrolled in synchronous E-Learning on the RPA financial robot application course. This includes both sophomore and junior students, totaling 1,765 individuals. A quota sampling method was utilized to select 80 students, and survey questionnaires were distributed accordingly. Ultimately, 80 valid questionnaires were received, meeting the criteria for further analysis.

3.3.2 Sample size

During the initial diagnostic phase, ten students were randomly chosen for interviews. In the current situation, 30 students were selected to participate in implementing the strategic plan. In the expected situation, the same 30 students will be surveyed again using the same research methods. Thus, the final sample size for this study comprises 80 students.

3.3.3 Sampling Procedures

A stratified random sampling approach was employed to ensure sample representativeness and improve estimation accuracy. Initially, the target population included 1,765 students from the School of Accounting, Zhanjiang University of Science and Technology, enrolled in synchronous E-Learning on the RPA financial robot application course, divided into three majors: auditing, financial management, and accounting, across two grades: sophomore and junior. Subsequently, the sample size for each grade was determined using a stratified random sampling method. Eighty questionnaires were distributed to sophomore and junior students at the School of Accounting, Zhanjiang University of Science and Technology, who are currently enrolled in synchronous E-Learning on the RPA financial robot application course via the Wenjuanxing platform. All 80 questionnaires were deemed valid and suitable for further analysis. Finally, a subset of 30 students, 80 of whom participated in the questionnaire survey, was selected.

3.4 Research Instruments

3.4.1 Design of Questionnaire

This study designed the survey questionnaire through three steps.

Step 1: Identify questionnaire sources (Cheng, 2020; Gashi et al., 2022; Nguyen & Nguyen, 2020;).

Step 2: Adjust questionnaire items in conjunction with the background of Zhanjiang University of Science and Technology.

Step 3: We implemented the crucial process of Item-Objective Congruence (IOC), ensuring the alignment of our questionnaire with our research objectives.

3.4.2 Components of Questionnaire

The questionnaire is divided into two parts.

The first part includes general information about the respondents. This part collects basic background information

of students, such as gender, grade, major, and experience with E-Learning.

The second part includes factors related to student satisfaction (Cheng, 2020; Gashi et al., 2022; Nguyen & Nguyen, 2020).

3.4.3 IOC Results

To ensure the validity of the student satisfaction survey questionnaire's validity, this study enlisted five evaluators' expertise to assess its design. Among these evaluators, two (Expert 1 and Expert 4) were external to the university and specialized in vocational education. The remaining three experts (Expert 2, Expert 3, and Expert 5) were affiliated with Zhanjiang University of Science and Technology and held doctoral degrees in educational management and leadership. Each evaluator independently reviewed the measurement tool, utilizing an Item-Objective Congruence (IOC) process, assigning a score of +1 for Consistent, 0 for Dubious, and -1 for Inconsistent. During the evaluation process, Expert 2 marked item Int5 as 0, Expert 3 marked item PU4 as 0, and Expert 5 marked item CDQ4 as 0. It was unanimously decided to retain these items in the questionnaire after thorough deliberation with the experts regarding the doubtful assessment items.

3.4.4 Pilot survey and Pilot test results

Following the initial examination of items using Item-Objective Congruence (IOC) testing, the study progressed to the reliability testing phase. During this phase, the student satisfaction survey, consisting of 24 items, was administered to a sample of 30 students. Following the reliability test, all evaluation items were retained. The table below displays the test results along with their correlations.

Table 1: Pilot Test Result

Variables	Items	Cronbach's Alpha	Strength of Association
Course Design Quality	4	0.958	Good
Instructor Attributes	3	0.713	Good
Interactive Attributes	5	0.870	Good
Perceived Usefulness	4	0.907	Good
Perceived Ease of Use	4	0.766	Excellent
Student Satisfaction	4	0.870	Good

4. Results and Discussion

4.1 Results

4.1.1 Demographic Profile

This study demonstrated the demographic profile of the entire research population (n=80), followed by the selected student group (n=30), who participated in the strategic plan, as shown in Table 2.

Table 2: Demographic Profile

Entire Research Population (n=80)		Frequency	Percent
Gender	Male	22	27.50%
	Female	58	72.50%
Grade	Sophomore	37	46.25%
	Junior	43	53.75%
Major	Accounting	12	15.00%
	Financial Management	34	42.50%
	Auditing	34	42.50%
E-learning Experience	YES	10	12.50%
	NO	70	87.50%
Total		**80**	**100%**
Strategic Plan Participants (n=30)		**Frequency**	**Percent**
Gender	Male	12	40.00%
	Female	18	60.00%
Grade	Sophomore	11	36.67%
	Junior	19	63.33%
Major	Accounting	9	30.00%
	Financial Management	14	46.67%
	Auditing	7	23.33%
E-learning Experience	YES	6	20.00%
	NO	24	80.00%
Total		**30**	**100%**

4.1.2 Results of multiple linear regression

This study conducted multiple linear regression analysis (MLR) on 80 valid questionnaire responses to validate support for each hypothesis. Five research hypotheses are related to the dependent variable, Student Satisfaction (SS). Based on the analysis of variance inflation factors (VIF), all VIF values for the independent variables in this study are below 5, indicating the absence of multicollinearity among the independent variables (Hair et al., 2014). The multiple linear regression analysis (MLR) results are presented in Table 3. At the variable level, all independent variables have p-values less than 0.05, indicating significant effects on the dependent variable, student satisfaction. Notably, the p-value for course design quality is less than 0.01, indicating a higher significance level. Furthermore, the standardized regression coefficients of all independent variables are greater than 0, indicating significant positive effects on the dependent variable, student satisfaction, under p-values less than 0.05.

At the overall regression model level, the overall fit of the model, represented by R square, is 0.603, indicating that the cumulative explanatory power of the independent variables, including course design quality, on the dependent variable, student satisfaction, is 60.3%.

Table 3: The multiple linear regression of five independent variables on teacher's satisfaction

Variables	Standardized Coefficients Beta	t	P-value	R	R^2
Course Design Quality (CDQ)	0.410	2.85	0.009*	0.777	0.603
Instructor Attributes (Ins)	1.032	2.68	0.013*		
Interactive Attributes (Int)	0.725	2.23	0.036*		
Perceived Usefulness (PU)	0.267	2.07	0.049*		
Perceived Ease of Use (PEU)	0.415	2.15	0.042*		

Note: p-value <0.05*

Our study, based on a thorough analysis, has tested and found support for the research hypotheses. This validation has been achieved through the robust methodology of multiple linear regression (MLR). The following are the final research hypotheses related to the changes in all variables between the current situation and the expected situation:

H6: There is a significant mean difference in course design quality between the current and expected situations.

H7: There is a significant mean difference in instructor attributes between current and expected situations.

H8: There is a significant mean difference in interactive attributes between the current and expected situations.

H9: There is a significant mean difference in perceived usefulness between the current and expected situations.

H10: There is a significant mean difference in perceived ease of use between the current and expected situations.

H11: There is a significant mean difference in student satisfaction between the current and expected situations.

4.2 Strategic Plan Process

Based on the interview results from the current situation, this study formulated a strategic plan for the subsequent stage. Although students struggled to articulate the concept of student satisfaction precisely, their responses generally conveyed positive emotions, such as feeling happy and content. While most students expressed satisfaction with synchronous E-Learning from their perspectives, a minority indicated a lower preference for this learning mode. Consequently, the strategic plan was designed to focus on guidance, goal-setting, and assisting participants in forming clearer visions and identifying suitable methods for achieving their objectives.

Week 1 to 2: The strategic plan commenced in Week 1 by forming a team comprising 30 students selected from the pool of 80 valid questionnaires. Subsequently, team awareness was bolstered through group guidance sessions and SWOT analysis, followed by establishing reasonable goals for the team. In Week 2, opportunities for self-adjustment were facilitated for both the team and individuals to align with the set goals. During these weeks, instructors designed appropriate classroom activities based on existing materials and students' course proficiency, focusing on enhancing course design quality and instructor attributes.

Week 3 to Week 7: From Week 3 to Week 7, the activities centered around interactive attributes, perceived usefulness, and perceived ease of use. During this stage, the 30 participating students engaged in specific activities aligned with their practical plans and actively participated in synchronous E-learning. Researchers provided group guidance, individual consultations, and other forms of assistance to help students gradually achieve their goals.

Week 8 to Week 14: Weeks 8 to 14 were critical within the strategic plan timeline. Following the planning phase (Weeks 1-2) and initial practice (Weeks 3-7), students understood student satisfaction well, although some misconceptions may have arisen. Individual consultations, guided by experts, became pivotal during this phase, enabling students to refine their understanding and explore more effective strategies to enhance satisfaction.

Week 15 to 16: During Weeks 15 to 16, all participating students must reflect on goal-setting and method effectiveness and gain insights, which will serve as resources for future research.

4.3 Results Comparison between Current Situation and Expected Situation

To determine whether there are significant differences in student satisfaction and its influencing factors between the current and the expected situation, this study conducted paired sample t-tests for all variables. Please refer to Table 4 for details.

Table 4: Paired-Sample T-Test Results

Variables	Mean	SD	t-Value	df
Course Design Quality				
Current Situation	3.54	1.097	-10.2	29
Expected Situation	4.63	0.632		

Variables	Mean	SD	t-Value	df
Instructor Attributes				
Current Situation	2.20	0.551	-17.1	29
Expected Situation	3.94	0.567		
Interactive Attributes				
Current Situation	2.81	0.609	-18.7	29
Expected Situation	4.39	0.428		
Perceived Usefulness				
Current Situation	2.92	1.123	-10.3	29
Expected Situation	4.44	0.561		
Perceived Ease of Use				
Current Situation	2.29	0.740	-17.4	29
Expected Situation	4.14	0.564		
Student Satisfaction				
Current Situation	2.77	1.009	-15.3	29
Expected Situation	4.23	0.656		

Based on the data in Table 4, there is a notable increase in course design quality during the expected situation (M=4.63, SD=0.632) compared to student satisfaction in the current situation (M=3.54, SD=1.097). The t-value is -10.2, and the p-value is below 0.01, indicating a mean difference of 1.09. Therefore, the statistical findings support hypothesis 6: There is a significant difference in course design quality between the current and expected situations.

Based on the data provided in Table 4, student satisfaction (M=3.94, SD=0.567) significantly increased during the expected situation compared to the current situation (M=2.20, SD=0.551). With a t-value of -17.1 and a p-value below 0.01, indicating a mean difference of 1.74, the statistical analysis supports hypothesis 7: There is a significant difference in instructor attributes between the current and expected situations.

Based on the findings from Table 4, student satisfaction during the expected situation (M=4.39, SD=0.428) shows a significant increase compared to the current situation (M=2.81, SD=0.609). The t-value is -18.7, with a p-value below 0.01, indicating a mean difference of 1.59. Thus, the statistical analysis supports hypothesis 8: There is a significant difference in interactive attributes between the current and expected situations.

Based on the data presented in Table 4, it is apparent that student satisfaction during the expected situation (M=4.44, SD=0.561) demonstrates a notable increase compared to student satisfaction in the current situation (M=2.92, SD=1.123). The t-value is -10.3, and the p-value is below 0.01, indicating a mean difference of 1.52. Therefore, with a p-value of less than 0.05, the statistical results support hypothesis 9: There is a significant difference in perceived usefulness between the current expected situation.

Based on the data presented in Table 4, it is evident that student satisfaction during the expected situation (M=4.14, SD=0.564) demonstrates a substantial increase compared to student satisfaction in the current situation (M=2.29, SD=0.740). The t-value is -17.4, and the p-value is below 0.01, indicating a mean difference of 1.85. Therefore, with the p-value being less than 0.05, the statistical findings support hypothesis 10: There is a significant difference in perceived ease of use between the current and expected situations.

Based on the data presented in Table 4, student satisfaction during the expected situation (M=4.23, SD=0.656) demonstrates a notable increase compared to student satisfaction in the current situation (M=2.77, SD=1.009). The t-value is -15.3, and the p-value is below 0.01, indicating a mean difference of 1.46. Consequently, with the p-value being less than 0.05, the statistical findings support hypothesis 11: There is a significant difference in student satisfaction between the current and expected situations.

In summary, notable differences were observed in all variables between the current situation and the expected situation. Student satisfaction with synchronous E-learning on the RPA financial robot application course at Zhanjiang University of Science and Technology significantly improved.

5. Conclusions, Recommendations and Limitations

5.1 Conclusions & Discussions

This study takes students enrolled in the synchronous E-learning on RPA financial robot application course at the School of Accounting, Zhanjiang University of Science and Technology, as an example to explore in depth the impact of course design quality, instructor attributes, interactive attributes, perceived usefulness, and perceived ease of use on student satisfaction. This study employed a comprehensive research design, data collection, and methodology to draw meaningful conclusions.

The research design incorporated the use of the Item-Objective Congruence (IOC) index and Cronbach's Alpha coefficient to assess the validity and reliability of the questionnaire, enhancing the survey's credibility. Questionnaire data were collected from 80 students enrolled

in the synchronous E-learning on RPA financial robot application course at the School of Accounting, Zhanjiang University of Science and Technology. Multiple linear regression analysis was conducted on the questionnaire data to verify the significant relationships between the independent and dependent variables. Additionally, the study implemented a 16-week strategic plan with a selected group of 30 students. Expected situation questionnaire surveys were conducted, and the data were subjected to paired-sample t-tests to determine whether significant differences existed between the current and expected situations for each variable.

The study findings indicate that course design quality, instructor attributes, interactive attributes, perceived usefulness, and perceived ease of use significantly impact student satisfaction with the synchronous E-learning course on the RPA financial robot application course at the School of Accounting, Zhanjiang University of Science and Technology. Results from paired-sample t-tests demonstrate significant differences in course design quality, instructor attributes, interactive attributes, perceived usefulness, perceived ease of use, and student satisfaction between current and expected situations.

Overall, this study represents a meaningful exploration, demonstrating that within the context of the School of Accounting, Zhanjiang University of Science and Technology, student satisfaction with synchronous E-learning on RPA financial robot application course can be enhanced by altering factors such as course design quality, instructor attributes, interactive attributes, perceived usefulness, and perceived ease of use. These findings provide valuable insights for Chinese private universities seeking to achieve high-quality teaching practices.

5.2 Recommendations

Based on the research results and discussions on factors influencing student satisfaction, this study offers the following targeted suggestions:

Firstly, flexible and practical course design is crucial. Clear objectives and content help students understand the material and spark interest. An organized structure aids knowledge mastery, enhancing outcomes. Ensuring comprehension of goals and requirements enhances motivation and reduces anxiety, creating a positive learning environment.

Secondly, teachers' role in E-Learning is pivotal. They should guide students and provide multifaceted assistance, keeping them from exploring independently.

Thirdly, interaction is crucial in E-Learning. Real-time discussion platforms and group projects promote collaboration, enhancing engagement and satisfaction.

Fourthly, perceived usefulness is vital in student attitudes. Practical demonstrations and case studies illustrate real-world applications, elevating satisfaction.

Fifthly, enhance perceived ease of use by developing user-friendly platforms and providing technical support channels, reducing frustrations.

These suggestions are derived from a comprehensive exploration of factors influencing student satisfaction in synchronous E-Learning. Implementing them can enhance educational quality and teaching strategies, providing valuable guidance for decision-makers and educators.

5.3 Limitations for Future Research

Despite yielding valuable insights into student satisfaction and its influencing factors, this study has limitations and shortcomings. Future research could explore the following areas:

Firstly, expanding the sample scope: While the study focused on 1765 students enrolled in the RPA financial robot application course at the School of Accounting, Zhanjiang University of Science and Technology, generalizing the findings to other courses, departments, or institutions requires further validation. Including a broader range of students from diverse backgrounds and fields could enhance the universality and reliability of the research outcomes.

Secondly, the strategic plan period should be extended: The current study implemented the strategic plan over one semester. Extending this period for longer-term tracking and observation could provide insights into the sustained impact of factors like course design quality on student satisfaction. It would also enable a deeper exploration of the sustainability and stability of strategic plan effects, leading to more comprehensive research conclusions.

Thirdly, introducing additional strategic plan factors: While the study primarily focused on the influence of course design quality on student satisfaction, future research could incorporate other strategic plan factors, such as community culture and individual student characteristics. This holistic approach would offer a more comprehensive understanding of the collective impact of various factors on student satisfaction and facilitate the development of more precise strategies for instructional improvement.

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