A Survey on The Satisfaction of College General Education Network Courses

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Abstract

The use of network platform to carry out general education courses has become a more common way in China's general education. In the Internet era, how to effectively use network platform resources, better carry out general education courses, and improve the learning satisfaction of general education is an important issue that needs to be solved. Based on previous studies, this study takes three dimensions of self-efficacy, teacher guidance and curriculum quality as factors affecting learning satisfaction, and introduces learning engagement as a mediating variable. Using the method of empirical research, this paper adopts convenient sampling to select some students from 10 universities in Guangxi which offer online courses of general education.Through the sample data, it is verified that self-efficacy, teacher guidance and curriculum quality have significant positive effects on learning satisfaction. Learning engagement has a partial mediating effect.

Keywords: General Education, Online Course, Learning Satisfaction, Learning Engagemen

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บทคัดย่อ

การใช้แพลตฟอร์มเครือข่ายในการดำเนินการหลักสูตรการศึกษาทั่วไปได้กลายเป็นวิธี ที่ทั่วไปมากขึ้นในการศึกษาทั่วไปของจีนในยุคอินเทอร์เน็ตวิธีการใช้ทรัพยากรแพลตฟอร์มเครือข่ายอย่างมีประสิทธิภาพดำเนินการหลักสูตรการศึกษาทั่วไป และปรับปรุงความพึงพอใจในการเรียนรู้ของการศึกษาทั่วไปเป็นประเด็นสำคัญที่ต้องได้รับการแก้ไขจากการศึกษาก่อนหน้านี้ การศึกษานี้ ใช้สามมิติของประสิทธิภาพตนเอง คำแนะนำครู และคุณภาพหลักสูตรเป็นปัจจัย ที่ส่งผลกระทบต่อความพึงพอใจในการเรียนรู้ และแนะนำการมีส่วนร่วมในการเรียนรู้เป็นตัวแปร ที่มีความหลากหลายรายงานนี้ ได้รับการยกตัวอย่างที่สะดวกเพื่อเลือกนักเรียนบางส่วนจาก 10 มหาวิทยาลัยในกวางซี ที่มีหลักสูตรออนไลน์ของการศึกษาทั่วไปผ่านข้อมูลตัวอย่างจะได้รับการยืนยันว่า ประสิทธิภาพตัวเองคำแนะนำครู และคุณภาพของหลักสูตรมีผลในเชิงบวกต่อความพึงพอใจในการเรียนรู้การมีส่วนร่วมในการเรียนรู้มีผลต่อการไกล่เกลี่ยบางส่วน

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Introduction

Colleges and universities shoulder the responsibility of delivering more high-level talents to the society, and general education plays a more important role in improving the quality of college talent training. Promoting general education is one of the important ways to improve the quality of college education and cultivate comprehensive talents (Xiang, 2020). Network technology guarantees the establishment of cross-university course selection, course sharing and course alliance, which brings opportunities to the teaching reform of China's general education. General education network courses can break through various restrictions and share high-quality course resources. General education network courses provide a new way to carry out general education (Gao et al., 2020). Universities are also constantly introducing high-quality online course platforms to promote the popularization and promotion of general education. The online course platform provides a wealth of general education online courses jointly with universities and social institutions, such as Chinese university MOOC, Super Star Erya and Wisdom Tree. As a brand new teaching model, general education online courses can not only make college students become the leader of learning, but also choose the courses they need to learn according to the needs of students, no longer subject to the restrictions of traditional general education courses. For example, in addition to high-quality teaching resources and auxiliary materials, online courses for general education also include a variety of disciplines and categories of online courses, which can provide students with a variety of course choices (L.Y. Zhao,2022). It can be seen that the promotion of general education network courses has played a great role in promoting the development of quality education in colleges and universities, and its importance is reflected in strengthening curriculum construction, optimizing structure, promoting education and teaching reform, improving teaching quality and promoting students' independent learning (Yao & H. B. Zhao, 2016).

The study of general education curriculum mainly focuses on curriculum quality, curriculum reform, learning satisfaction and its influencing factors.

A study on the curriculum quality of general education courses. Zhang & Gong (2021) follows up and evaluates curriculum quality from three steps and six links.G. Liu & Zou (2023) believed that the teaching ability and level of individual teachers need to be improved, and students' lack of understanding of the value of the curriculum leads to their neglect of the curriculum, which are the two main reasons for the low quality of the current curriculum.L.Li & H.Li (2022) put forward constructive suggestions on curriculum quality from the perspectives of effectively improving students' learning input, building high-quality courses, and dealing with the relationship between academic burden and learning mode transformation.

Research on curriculum reform of general education course. As for the direction of curriculum reform, Jiang(2022) should take the interests of students as the starting point, emphasize the dominant position of teachers in the classroom, and give full play to the initiative and creativity of students. Chen(2021) conducted a study on curriculum reform of general courses of aesthetic education in colleges and universities, and proposed reform strategies of clarifying teaching ideas, diversifying course content and professionalizing teaching staff. Jin (2022) from the perspective of following the law of education and teaching, put forward suggestions from three perspectives: building the teaching structure of general education courses, optimizing the curriculum setup, and reforming teaching methods.

A study on improving learning satisfaction and influencing factors in general education courses. L.M.Huang & Nan(2020) found that factors affecting undergraduates' satisfaction with general education courses include unreasonable assessment forms, conflict between general education courses and professional courses, etc. H.F.Huang et al. (2019) pointed out that the satisfaction of general education should be improved from the aspects of curriculum system and teaching content optimization, teaching methods improvement, strengthening course management and creating a good general education atmosphere. L.Wang (2018) pointed out that explanatory variables include course characteristics, personal characteristics and other variables when studying the influencing factors of MOOC learners' learning. Zhong (2015) pointed out that schools, teachers and students are the factors that affect the satisfaction of general education courses. J.Wang & C.X.Wang(2020) pointed out that the cognitive attitude, the appropriateness of content, the degree of achievement of educational goals, the heuristic of teaching methods, and the scientific nature of curriculum design and management of general education courses are the main factors influencing the satisfaction of general education courses. The evaluation of these aspects can promote the quality improvement of general education and the improvement of students' quality.

There are few researches on online courses of general education, and more researches focus on online learning satisfaction. L.Yang et al. (2019) believes that universities of science and technology need to build and introduce general education online courses. The research finds that the main factors affecting the satisfaction of general education online courses include teaching methods, assessment forms, course management and course content, and the impact of individual student differences is not significant. Ren (2021) takes some undergraduates of Y University as research objects and finds that students' satisfaction with online learning needs to be further improved. The research shows that students' learning expectation and perceived quality have an impact on perceived quality, learning satisfaction can affect their learning intention, and individual characteristics also affect satisfaction.

To sum up, there are few studies on the learning satisfaction of online courses of general education at present, which mainly focus on the quality of courses, curriculum reform, learning satisfaction and its influencing factors, etc. The relevant studies are mainly on the satisfaction of online courses, which provides a reference for us to study the learning satisfaction of online courses of general education. This research can analyze the current situation of general education online courses, understand the main factors affecting their learning satisfaction, and then put forward relevant opinions and suggestions to improve satisfaction, which is conducive to improving the overall quality of college students. General education is responsible for the main mission of cultivating a complete person in university education. Xie et al. (2018) believes that general education is a kind of human nature education, which reflects humanistic care and aims to promote interpersonal communication in cross-cultural and cross-social environments and cultivate all-round personality quality. In addition, general education is also a way of thinking education, emphasizing the training of students to analyze knowledge and scientific thinking methods, rather than just mastering the knowledge of a certain subject. As a part of general education, general education network courses are worthy of our research in their field. Xu et al. (2021) believes that general education network courses are aimed at cultivating students' overall quality, emotional intelligence and team responsibility, and shaping them to have a high sense of social responsibility, diversified knowledge structure and personality traits. Therefore, it has extremely important social significance. Then, the study on their learning satisfaction has found a breakthrough point

for us to study general education online courses. Kanwar Anita et al. (2022) Students' learning and development is the core of higher education career, and students are indispensable stakeholders in any educational institution. Students' learning satisfaction can measure the teaching quality and effect of educational institutions, reflect whether educational institutions can meet the needs and expectations of students, and is also an important basis for the sustainable development of educational institutions.

Literature Review

General Education online courses

The digital form of general education provides a new path for the development of general education courses, and networking provides technical means for general education courses. Various colleges and universities introduce general education network courses one after another, and the degree of network courses is gradually improved, but the teaching effect of network courses still needs to be improved (Y.D.Li & Shao, 2021). Internet technology provides rich teaching resources and strong technical support for the effective penetration of general education concepts (M.Wen, 2022). General education in this context can fully solve the problem of insufficient knowledge of college students and promote the accumulation of rich cultural knowledge qualities of college students (L.L.Yang, 2023). In order to better promote the implementation of general education network courses in colleges and universities, it is necessary to strengthen the publicity of online general education, so that people can better understand the importance of general education to the development of students' comprehensive literacy, and thus better promote the implementation and development of general education in colleges and universities (X.R.Zhao,2022). It can be seen that the prevailing online courses of general education continue to expand the innovative teaching mode of colleges and universities and realize the diversity of higher education content (Zhan et al., 2022).

Customer satisfaction and learning satisfaction

It is generally recognized in the academic community that satisfaction is a psychological reaction, which refers to people's judgment on whether the quality of the products or services they receive can meet their needs and expectations, which has been defined in detail by Oliver (Tian,2021). When the theory of customer satisfaction was rapidly spread and

applied in many countries, researchers began to introduce customer satisfaction into the field of education for research and application, and the United States was the first to study students' learning satisfaction (Qin, 2022). The concept of learning satisfaction is originally borrowed from "customer satisfaction". Simply put, learning satisfaction is a certain emotional state generated by comparing students' learning gains with expected results after a period of learning. (Ma, 2022). Improving online learning satisfaction is an important means to realize the substantial equivalence between online teaching and classroom teaching quality. The construction of the hypothesis model of online learning satisfaction, which comprehensively applies the theories such as customer satisfaction index model, technology acceptance model, system information continuous use model and self-determinism, involves multiple disciplines (F.Q.Sun, 2022). The research content of customer satisfaction in the commercial field is introduced to study the influencing factors of MOOC learners' satisfaction. Learners are the main body and users of the MOOC platform, and ensuring learners' satisfaction with the current MOOC platform is an important topic in the current development of MOOC (Y.Zhang, 2018). To sum up, customer satisfaction theory will be the main theoretical basis of this study. On the basis of customer satisfaction, there is learning satisfaction, and the level of learning satisfaction will affect students' learning interest and curriculum quality.

Hypotheses Development

About the learning satisfaction of learners in network general studies, this study puts forward Relevant assumptions.

X.J.Liu et al. (2023) pointed out that teachers' after-school tutoring for college students in online courses is an important factor affecting their course learning satisfaction. Effective tutoring can enhance college students' mastery of knowledge, answer questions and solve doubts for students, facilitate the communication between teachers and students, and contribute to the improvement of students' study satisfaction.L.W.Hu et al. (2022) pointed out that it is necessary to enhance the satisfaction of online learning and strengthen teachers' tutoring for students' after-school learning from the perspective of improving teachers' methods and methods. Wu (2023) found from the study of online learning in vocational education that teachers' guidance and control of courses, overall course design structure and students' autonomous learning ability all play a certain role in promoting

students' learning participation. Especially in the area of teacher guidance, tutoring and tracking of lesson planning, communication, and process can promote student engagement in learning. Therefore, it can be inferred that teacher guidance is one of the influencing factors of learning satisfaction, so the hypothesis is proposed:

H1: Teacher guidance has a significant positive impact on learning satisfaction.

The influencing factors of students' self-learning efficacy and learning satisfaction are highly consistent. Colleges and universities should use various teaching means to enhance students' self-efficacy and continuously improve students' learning satisfaction (Y.L.Hu, 2018). Y.Y. Li et al. (2020) pointed out that self-efficacy affects college students' online learning satisfaction. When studying the relationship between academic self-efficacy and learning satisfaction, Tan (2016) proposed that there is a positive correlation between academic self-efficacy and learning satisfaction, so he proposed the following hypothesis:

H2: Students' self-efficacy has a significant positive impact on learning satisfaction.

curriculum quality is the reflection of students' learning experience and learning perception after they truly participate in professional learning, which is the real feeling of students combined with their own reality, and will have a direct impact on their learning satisfaction. Yin et al. (2023) studied the impact of curriculum quality perception on learning satisfaction from the perspective of curriculum quality. Through testing, the author found that curriculum quality had a significant impact on college students' online learning satisfaction. The research results have a certain reference significance for improving the quality of online courses for college students. Lu et al. (2022) pointed out that curriculum quality is the reflection of students' learning experience and learning perception after they truly participate in professional learning, which is the real feeling of students combined with their own reality, and will have a direct impact on their learning satisfaction. curriculum quality has a positive correlation with learning satisfaction (He et al., 2021). Therefore, the following hypothesis is proposed:

H3: curriculum quality has a significant positive impact on learning satisfaction.

Qi et al. (2021) studied the relationship between college students' participation, learning engagement and learning satisfaction in online learning. It is found that there is a significant positive correlation between learning engagement and learning satisfaction. It can be assumed that:

H4: Students' learning engagement has a significant positive impact on their learning satisfaction.

Students' learning engagement has a direct impact on teaching quality, and teacher guidance factors have the most obvious impact on learning engagement, including teacher-student interaction, teacher feedback and teaching activity arrangement (H.Y.Sun & Pan et al., 2022). R.W. Huang et al. (2019) pointed out that the factors affecting MOOC learning engagement can be summarized into six aspects: learner main factor, teacher guidance factor, platform support factor, curriculum construction factor, learner peer factor and policy support factor. Therefore, it can be inferred that teacher guidance is one of the factors affecting student participation, so the hypothesis is proposed:

H5: Teacher guidance has a significant positive impact on learning satisfaction through student engagement.

Ge (2021) found that high school students' online learning participation was positively correlated with self-efficacy. According to the research of Zimmerman et al. (2011), learning engagement belongs to the behavioral level, while self-efficacy belongs to the motivational level, both of which play a role in the learning process and outcome. In addition, Wen & C.L.Zhu (2021) found that there is a positive correlation between students' self-efficacy, learning satisfaction and learning engagement, and learning engagement plays an intermediary role between them. It can be assumed that:

H6: Student self-efficacy has a significant positive impact on learning satisfaction through student engagement.

In the online learning environment of MOOCs, the quality of MOOCs is one of the factors that affect the participation of MOOCs online learning (Guo, 2020).L.J. Qu & L.Sun (2019) pointed out that curriculum quality has a significant impact on the improvement of students' participation in course learning. It can be assumed that:

H7: curriculum quality has a significant positive impact on learning satisfaction through student participation.

Based on the above, this study takes teacher guidance, students' self-efficacy and curriculum quality as independent variables, students' learning engagement as intermediary variables, and learning satisfaction as outcome variables, to build a theoretical model of learning satisfaction for online courses of general education (as shown in Figure 1).

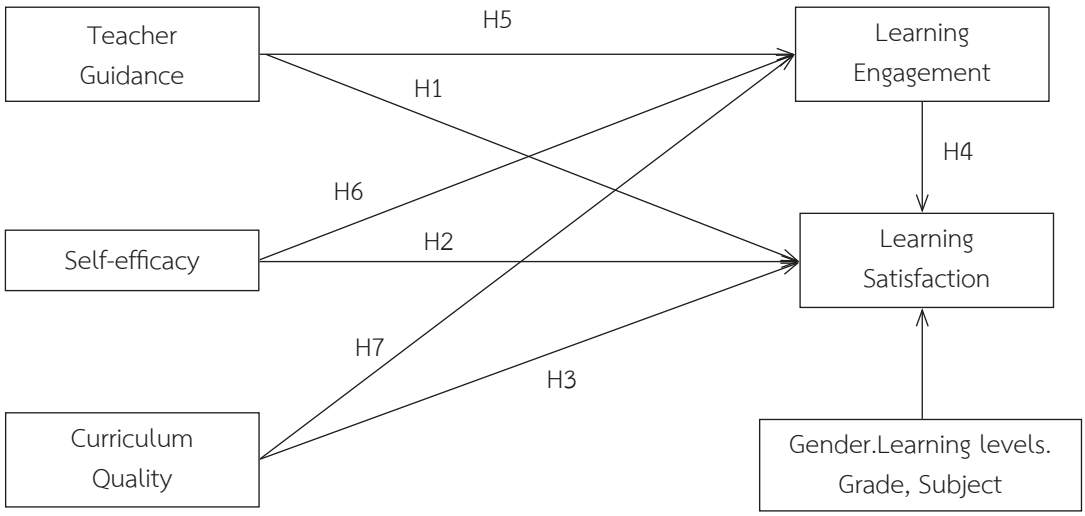

Figure 1: Proposed Hypothesized Model

Research Methodology

Research object

In this study, students in universities in Guangxi, which offer online courses of general education, will be selected as the research objects. Guangxi is located in the southwest ethnic minority region, and the development of higher education in Guangxi is slower than that in the central and eastern regions (Y. Huang, 2021). General education is a crucial part of higher education. Its positive role in improving the comprehensive quality of college students has been widely recognized in universities (Wei & H.Ding 2022). Therefore, this study takes college students in Guangxi as the research object, which has certain practical significance for studying the learning satisfaction of general education online courses in Guangxi colleges and universities, and can start from studying the learning satisfaction to find ways to improve the quality of general education online courses.

Sampling methods and sample collection

At present, there are 85 colleges and universities in Guangxi, among which 38 are undergraduate colleges and 47 are junior colleges. By the end of 2022, there will be 1.408 million undergraduate and junior college students (Education Department of Guangxi Zhuang Autonomous Region, 2023). Considering objective reasons such as time and cost, this study will use convenient sampling method to select research objects. Firstly, 10 universities in Guangxi that offer online courses of general education will be contacted through various channels as research samples. Secondly, a certain number of students are randomly selected as research objects in the contacted universities. Finally, according to the sampling results, the relevant statistical analysis is carried out.

According to Xiong & J.L.Liu (2022), the sample size of the questionnaire effectively recovered should be at least five times more than the number of questionnaire questions. The questionnaire in this study has 35 questions, so the sample size should be at least 175.

Instruments

In this study, quantitative methods are used to test the proposed model. An online self-filling questionnaire was used to collect data. The questionnaire was divided into two parts. The first part is the demographic data, including the student's gender, learning levels (undergraduate/junior college), grade, subject, whether they have participated in the study of General education network courses and the school they attended; In the second part, a 5-point Likert scale (from 1 = strongly disagree to 5 = strongly agree) was used to measure the psychological perception of the respondents, and 35 items were adjusted from Y.B.Li et al. (2021), Jessica Li et al. (2015), Shi et al. (2023). Fredricks et al. (2004) and C.L Wang (2020). In addition, after the questionnaire was designed, a small range of pre-test was conducted in Beihai Campus of Guilin University of Electronic Science and Technology, and 102 questionnaire data were collected. Among them, 9 points were students who had not participated in online courses of general education, so 93 effective pre-test questionnaires were collected. Cronbach's alpha test results showed that the reliability of all dimensions was greater than 0.8 (as shown in Table 1). KMO test and Bartlett sphericity test were used to test the validity of the scale (as shown in Table 2). The analysis found that KMO = 0.812 > 0.7 and Bartlett sphericity test was significant ($p < 0.001$), indicating that the overall validity of the scale was good.

Table 1: Reliability analysis

Variable	Number of terms	Cronbach's Alpha
Teacher guidance	6	0.897
Self-efficacy	6	0.941
Curriculum quality	7	0.923
Learning engagement	6	0.915
Learning satisfaction	4	0.926

Table 2: KMO and Bartlett tests

KMO		0.812
Bartlett sphericity test	Approximate chi-square	2448.695
	Degree of freedom (df)	406
	significance (p)	0.000

Results

Analysis of the Measurement Model

Before the structural model assessment, all the required criteria should be satisfied (Hair et al., 2019). The reliability and validity of the measurement model were measured as follows: the factor loadings, Cronbach's alpha (CA), composite reliability (CR), average variance extracted (AVE), and discriminant

validity as illustrated in Table 3 and Table 4.

Firstly, the reliability analysis is carried out. The reliability of each dimension of the sample data scale is greater than 0.8, so the scale has good stability and certain credibility.There are two important indicators of convergence validity, namely, combination reliability (CR) and mean variance extraction (AVE). When CR>0.7 and AVE>0.5, it indicates that the measurement dimension has good convergence validity. In general, the standardized factor load coefficient is used to express the variable relationship between the factor and the analysis item. If it is significant and the standardized factor load coefficient is greater than 0.6, it indicates a strong correlation. As can be seen from Table 2, CR values are both greater than 0.8, and AVE values are greater than 0.5, indicating that the sample data

of this scale has good convergence validity.Discrimination validity requires that AVE square root value is greater than the correlation coefficient between this factor and other factors. As can be seen from the table, the arithmetic square root of AVE value of all variables is greater than the correlation coefficient between this factor and other factors, indicating that the sample data of this scale has good discrimination validity.

Table 3: Construct Reliability and Validity

		Factor load	CA	CR	AVE
A1	F1	0.717	0.881	0.886	0.566
A2	F1	0.767			
A3	F1	0.872			
A4	F1	0.817			
A5	F1	0.668			
A6	F1	0.648			
B1	F2	0.871	0.928	0.928	0.683
B2	F2	0.878			
B3	F2	0.769			
B4	F2	0.784			
B5	F2	0.827			
B6	F2	0.825			
C1	F3	0.825	0.951	0.951	0.734
C2	F3	0.756			
C3	F3	0.829			
C4	F3	0.909			
C5	F3	0.900			
C6	F3	0.893			
C7	F3	0.876			
D1	F4	0.852	0.929	0.929	0.687
D2	F4	0.771			
D3	F4	0.836			
D4	F4	0.821			
D5	F4	0.853			
D6	F4	0.838			
F1	F5	0.795	0.915	0.917	0.735
F2	F5	0.915			
F3	F5	0.897			
F4	F5	0.815			

Table 4: Discriminative validity

	1	2	3	4	5
Teacher guidance	0.752				
Self-efficacy	0.652**	0.827			
Curriculum quality	0.522**	0.628**	0.857		
Learning engagement	0.691**	0.762**	0.645**	0.829	
Learning satisfaction	0.510**	0.519**	0.455**	0.598**	0.857

Correlation analysis

Correlation analysis is used to show the strength of the relationship between two or more variables. Through correlation analysis, we can understand the correlation between variables. Since the scale data in this study met the normal distribution, Pearson correlation coefficient was used and its significance was marked, and the relevant results were shown in Table 5.Teacher guidance has a positive correlation with both learning engagement and learning satisfaction, and the correlation coefficients R are 0.691 and 0.510, respectively, and both are significant at $p<0.01$ level. Self-efficacy has a positive correlation with both learning engagement and learning satisfaction, and the correlation coefficients R are 0.762 and 0.519, respectively, and both are significant at $p<0.01$ level. curriculum quality has a positive correlation with learning participation and learning satisfaction, and the correlation coefficients R are 0.645 and 0.455, respectively, and both are significant at $p<0.01$ level. Learning engagement has a positive correlation with learning satisfaction, and the correlation coefficient R is 0.598, and all of them are significant at $p<0.01$ level. The above test results show that there is a strong correlation between the study variables

Table 5: Correlation analysis

	Teacher guidance	self-efficacy	Curriculum quality	Learning engagement	learning satisfaction
Teacher guidance	1				
Self-efficacy	0.652**	1			
Curriculum quality	0.522**	0.628**	1		
Learning engagement	0.691**	0.762**	0.645**	1	
Learning satisfaction	0.510**	0.519**	0.455**	0.598**	1

Regression analysis

The regression analysis of teacher guidance, self-efficacy and curriculum quality on learning satisfaction was conducted, and the results are shown in Table 6. In the equation obtained by regression of teacher guidance, self-efficacy and curriculum quality on learning satisfaction, F value is 33.973 and significance is 0.000 ($p<0.001$), indicating that the regression model constructed is significant. The standard regression coefficient of teacher guidance on learning satisfaction was 0.253, and the significance was 0.000 ($p<0.001$), indicating that teacher guidance had a positive impact on learning satisfaction, and the impact was significant. The standard regression coefficient of self-efficacy on learning satisfaction was 0.267, and the significance was 0.000 ($p<0.001$), indicating that self-efficacy had a positive impact on learning satisfaction, and the impact was significant. The standard regression coefficient of curriculum quality on learning satisfaction is 0.161, and the significance is 0.001 ($p<0.005$), indicating that self-efficacy has a positive impact on learning satisfaction, and this impact is also significant. Based on the above analysis, it is assumed that H1, H2 and H3 are all valid.

Table 6: Regression analysis of teacher guidance, self-efficacy and curriculum quality on learning satisfaction

Dependent variable	Independent variable	Standard regression coefficient	Sig.	VIF	R square	The adjusted R square	F	Sig.
Learning satisfaction	sex	0.007	0.858	1.139	0.342	0.332	33.973	0.000
	level	0.035	0.431	1.338				
	grade	-0.065	0.120	1.214				
	discipline	-0.023	0.592	1.261				
	Teacher guidance	0.253	0.000	1.835				
	Self-efficacy	0.267	0.000	2.325				
	Curriculum quality	0.161	0.001	1.727				

The regression analysis of teacher guidance, self-efficacy and curriculum quality on learning engagement is conducted, and the results are shown in Table 7. In the equation obtained by regression of teacher guidance, self-efficacy and curriculum quality on learning engagement, F-value is 136.181 and significance is 0.000 ($p<0.001$), indicating that the regression model constructed is significant. The standard regression coefficient of teacher guidance on learning participation was 0.291, and the significance was 0.000 ($p<0.001$), indicating that teacher guidance had a positive effect on learning participation, and this effect was significant. The standard regression coefficient of self-efficacy on learning satisfaction was 0.442, and the significance was 0.000 ($p<0.001$), indicating that self-efficacy had a positive impact on learning engagement, and the impact was significant. The standard regression coefficient of curriculum quality on learning engagement is 0.219, and the significance is 0.000 ($p<0.001$), indicating that self-efficacy has a positive impact on learning engagement, and this impact is also significant. Based on the above analysis, it is assumed that H5, H6 and H7 are all valid.

Table 7: Regression analysis of teacher guidance, self-efficacy and curriculum quality on learning engagement

Dependent variable	Independent variable	Standard regression coefficient	Sig.	VIF	R square	The adjusted R square	F	Sig.
Learning engagement	sex	0.034	0.232	1.139	0.676	0.671	136.181	0.000
	level	0.035	0.431	1.338				
	grade	-0.065	0.120	1.214				
	discipline	-0.023	0.592	1.261				
	Teacher guidance	0.253	0.000	1.835				
	Self-efficacy	0.267	0.000	2.325				
	Curriculum quality	0.161	0.001	1.727				

The regression analysis of learning engagement on learning satisfaction is carried out, and the results are shown in Table 8. In the equation obtained by regression of learning engagement to learning satisfaction, F value is 52.198 and significance is 0.000 ($p<0.001$), indicating that the regression model constructed is significant. The standard regression coefficient of learning participation on learning satisfaction is 0.601, and the significance is 0.000 ($p<0.001$), indicating that learning participation has a positive impact on learning satisfaction, and this impact is significant, so hypothesis 4 is valid.

Table 8: Regression analysis of learning engagement and learning satisfaction

Dependent variable	Independent variable	Standard regression coefficient	Sig.	VIF	R square	The adjusted R square	F	Sig.
Learning satisfaction	sex	-0.023	0.555	1.112	0.362	0.356	52.198	0.000
	level	0.035	0.431	1.338				
	grade	-0.065	0.120	1.214				
	discipline	-0.023	0.592	1.261				
	Learning engagement	0.253	0.000	1.835				

An examination of the mediating role of learning engagement

In order to more accurately compare the results of each effect size of the three groups of intermediary models, the process plug-in was used to calculate the direct and indirect effects of the model, and the bootstrap method was used to sample 5000 times for deviation correction. The calculation results show that the mediating effect sizes of teacher guidance, self-efficacy and curriculum quality on learning satisfaction through learning engagement are 0.3417, 0.3920 and 0.3547, respectively, and the 95% confidence intervals of direct effects and mediating effects in the three groups of paths do not contain 0, which further verifies the hypothesis of some mediating effects in the model.The results are shown in Table 9.

Table 9: Intermediate analysis result

Effector process	Effect coefficient	95% confidence interval	
		LLCI	ULCI
Direct effect (Teacher Guidance ⟶ Learning satisfaction)	0.1873	0.005	0.827
Indirect effect (Teacher guidance ⟶ Learning engagement ⟶ Learning satisfaction)	0.3417	0.2460	0.4355
Direct effect (Self-efficacy ⟶ Learning satisfaction)	0.1840	0.035	0.610
Indirect effect (Self-efficacy ⟶ Learning engagement ⟶ learning satisfaction)	0.3920	0.2530	0.5278
Direct effect (Curriculum quality ⟶ Learning satisfaction)	0.1275	0.0135	0.0264
Indirect effect (Curriculum quality ⟶ Learning engagement ⟶ Learning satisfaction)	0.3547	0.2640	0.445

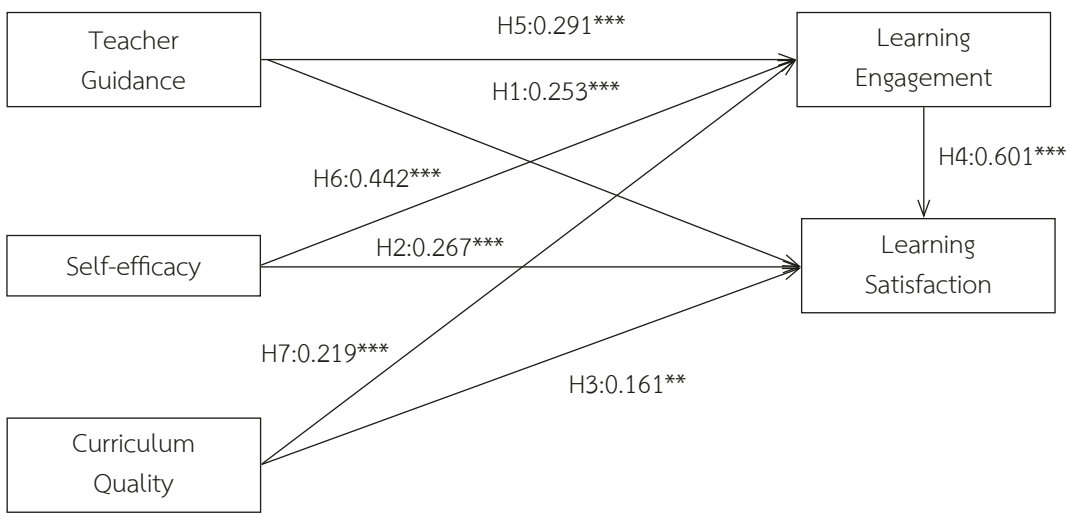

Figure 2: Path analysis result

Discussion and Conclusion

The sample data collected in this study were analyzed by statistical methods, and the following results were obtained:

Teacher guidance has a significant positive impact on learning satisfaction (the standard regression coefficient is 0.253, and $p<0.001$), indicating that there is a positive correlation between the two. This test result is consistent with the conclusion of Wu (2023). Students' self-efficacy has a significant positive impact on learning satisfaction (the standard regression coefficient is 0.267, and $p<0.001$), indicating a positive correlation between the two. This test result is consistent with the conclusion of Y.Y. Li et al.(2020).curriculum quality has a significant positive impact on learning satisfaction (the standard regression coefficient is 0.161, and $p<0.001$), indicating a positive correlation between the two. This test result is consistent with the conclusion of He et al. (2021).In conclusion, assuming that H1, H2 and H3 are supported, self-efficacy, teacher guidance and curriculum quality all have significant positive effects on learning satisfaction.

Teacher guidance has a significant positive impact on students' learning engagement (the standard regression coefficient is 0.291, and $p<0.001$), indicating a positive correlation between the two. This test result is consistent with the conclusion of R.W. Huang et al. (2019). Students' self-efficacy has a significant positive impact on students' learning engagement (the standard regression coefficient is 0.442 and $p<0.001$), indicating a positive correlation between the two. This test result is consistent with the conclusion of Wen & C.L.Zhu (2021). curriculum quality has a significant positive impact on students' learning engagement (the standard regression coefficient is 0.219, and $p<0.001$), indicating a positive correlation between the two. This test result is consistent with the conclusion of L.J. Qu & L.Sun (2019). In summary, assuming that H5, H6 and H7 are supported, self-efficacy, teacher guidance and curriculum quality all have significant positive effects on learning engagement.

Students' learning engagement has a significant positive impact on their learning satisfaction (the standard regression coefficient is 0.601, and $p<0.001$), indicating a positive correlation between the two. This test result is consistent with the conclusion of Qi et al. (2021) .

Limitations

Although this study has been proved by empirical evidence, there are still some deficiencies and limitations.

First, there are certain limitations in the selection of samples. This study only conveniently sampled 10 universities in Guangxi, and the number of undergraduate universities is more than that of junior colleges. At present, there are 38 undergraduate universities and 47 junior colleges in Guangxi, which may affect the representativeness of the samples to some extent.

The second is in the dimension of research. This study is conducted from three dimensions: learners, teachers and platform curriculum quality, but only studies self-efficacy at the learner level, without considering the influence of other factors of learners on learning satisfaction.

The third is the influence of other intermediaries. This study only considers the mediating effect of learning engagement on teacher guidance, self-efficacy, curriculum quality and learning satisfaction, and does not consider the influence of other mediating variables. The effects of other mediating variables on teacher guidance, self-efficacy and curriculum quality on learning satisfaction were ignored. Moreover, the influence of other mediating variables can not be ignored.

Fourth, the research depth is not enough. This study mainly refers to the core papers in China, with little reference to literatures from countries other than China. Moreover, there are few literatures specializing in the study of online courses of general education. The literatures mainly refer to literatures on learning satisfaction of online courses of general education, which are still different from those of online courses of general education.

Conclusion

This paper takes the learning satisfaction of the network course of general education in Guangxi university as the research object, and finds through the empirical study that: teacher guidance has a significant positive impact on the learning satisfaction; Students' self-efficacy has a significant positive impact on learning satisfaction. curriculum quality has a significant positive impact on learning satisfaction; Students' learning engagement has a significant positive impact on their learning satisfaction. Learning engagement plays an enhanced mediating role among teacher tutoring, self-efficacy, curriculum quality and learning satisfaction.

Suggestion

The learning engagement of general education network courses has an important influence on the learning satisfaction. In the online learning environment, learners usually need more autonomy and self-discipline, so the influence of learning engagement on learning satisfaction is particularly important. Universities should make efforts in learning engagement to improve learning satisfaction.

Self-efficacy has a certain influence on learning engagement. Colleges and universities can improve learners' learning engagement by stimulating their self-efficacy, for example, by providing support and encouragement, providing positive feedback, and cultivating learners' self-learning ability. At the same time, helping learners to establish and improve self-efficacy is also an important way to improve learners' learning participation and learning satisfaction.

The way and method of teachers' guidance in the study of general education network courses have a certain influence on students' learning participation. The learning environment of the general education network course is different from the traditional classroom, and students need more independent learning and self-management ability. Therefore, the ways and methods of teachers' tutoring need to be appropriately adjusted for the e-learning environment. By providing clear learning goals and feedback, creating interactive opportunities by using online tools, providing diversified learning resources and strategies, and personalized tutoring, students' learning participation can be effectively improved.

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