A Framework for Evaluating Online Degree Programs Through Student Satisfaction

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Abstract

Student satisfaction is a key performance indicator in evaluating any degree program's performance. In light of the vast difference between online and traditional degree programs, factors that may significantly affect student satisfaction and thus contribute to the success of online degree programs still need to be explored. Previous literature on student satisfaction either focused on the course level or researched the factors for traditional face-to-face degree programs. This study shifts the focus to online degree programs by integrating the existing literature and proposing a new conceptual framework for evaluating online degree programs. The proposed conceptual framework includes six big categories of factors and three outcome variables related to student satisfaction. The theoretical underpinning of the conceptual framework was supported by a comprehensive literature review regarding each of the six factors. Data were collected from two online engineering degree programs in a large public university to assess the underlying relationships and identify the key factors affecting student satisfaction. This research contributes to the existing literature in the following four aspects: 1) it integrates the existing literature and proposes a new framework for evaluating online degree programs; 2) it identifies critical factors for evaluating online degree programs through student satisfaction; 3) it extends the definition and construct of student satisfaction, and assesses the construct from three dimensions; and 4) it provides suggestions to the policymakers such as school administrators and accreditation bodies.

Keywords: Online degree program, student satisfaction, key factors, perceived learning, program recommendation

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The outbreak and spread of COVID-19 changed many people's lifestyles, significantly affecting traditional face-to-face education (Dhawan, 2020). More and more universities have shifted to the online teaching format to accommodate this changing educational environment, and the number of fully online degree programs is expected to experience rapid growth in the coming years (Crawford et al., 2020). Online educational platforms such as Canvas and Blackboard and video conferencing solutions such as Zoom and Webex have been widely adopted to facilitate online teaching and communication (Chaka, 2020). Technology companies have significantly improved online educational platforms and video conferencing solutions over the past few years to embrace this trend.

The online degree program differs considerably from traditional face-to-face education in many ways, including but not limited to 1) interactions, 2) course structure and organization, 3) use of technologies, and 4) student motivation. First, it is different in terms of how students interact with the instructors and how they interact with each other (Alqurashi, 2019; Kuo et al., 2014). For instance, students interact directly with instructors and other students in traditional classroom settings, while less communication and fewer interactions may be observed in an online learning environment.

Second, how online courses are organized and structured (Gray & DiLoreto, 2016) differs from traditional face-to-face education. For instance, the classes may be designed and delivered weekly in traditional education settings, while in an online learning environment, lectures may be prepared and posted early and made available to all at once, and students may be allowed to study at their own pace.

Third, online education differs from traditional face-to-face education in terms of the use of technologies (Freeman & Urbaczewski, 2019). For instance, students must use specific learning management systems (LMS) or video conferencing software to take classes in an online learning environment, whereas the use of specific technologies might not be a requirement in a traditional classroom setting. The use of technologies may lead to particular issues, such as whether the LMS and software are helpful or easy to use.

Finally, how students are motivated in online instruction differs from traditional face-to-face education (Suhre et al., 2007; Tseng et al., 2019). In a traditional educational setting, students are usually surrounded by their instructors and classmates. They are more likely to be motivated by such an immersive environment and be pushed to pursue their learning objectives, while in online education, students are often required to be more self-regulated and self-motivated (Wong et al., 2019).

Considering the significant differences between the online degree program and traditional face-to-face education, and in light of the ongoing trend of online learning, it is imperative to understand what key implications may be addressed and what factors may significantly contribute to the success of online degree programs.

Significance of This Study

Previous literature either focused on the factors at the course level or researched the factors for the traditional face-to-face degree programs. This study shifts the focus to online

degree programs by integrating the existing literature and proposing a new theoretical framework for evaluating them. We review the factors affecting student satisfaction at the course and traditional degree program levels. A new conceptual framework will be proposed, and a comprehensive literature review on each factor will be conducted.

Student satisfaction is a key performance indicator for the success of any online degree program (e.g., Alqurashi, 2019; Blau et al., 2019; Gray & DiLoreto, 2016). In light of the vast difference between online and traditional degree programs, how student satisfaction is evaluated and what factors may significantly affect student satisfaction and thus contribute to the success of online degree programs are still underexplored (Freeman & Urbaczewski, 2019).

This study has been developed to answer the following research questions (RQs):
RQ1: What conceptual framework can be used to evaluate online degree programs?
RQ2: What critical factors may affect student satisfaction in online degree programs?
RQ3: How is student satisfaction defined and assessed?

By responding to the above research questions, this research contributes to the existing literature in the following four aspects: 1) it integrates the existing literature and proposes a new framework for evaluating online degree programs; 2) it identifies critical factors in evaluating online degree programs through student satisfaction; 3) it extends the definition and construct of student satisfaction by evaluating it from three dimensions; and 4) it provides suggestions to policymakers such as school administrators and accreditation bodies.

Literature Review

Previous Literature Focused on the Factors at the Course Level

Previous research on distance learning or online education often focused on the factors at the course level. For instance, Wei and Chou (2020) investigated a general-education undergraduate online course; they suggested the positive effects of computer/internet self-efficacy (CIS) and motivation for learning (ML) on student satisfaction and online learning performance. Alqurashi (2019) studied the impact of online learning self-efficacy (OLSE), learner-content interaction (LCI), learner-instructor interaction (LII), and learner-learner interaction (LLI) on student satisfaction and perceived learning at the course level.

Gray and DiLoreto (2016) summarized the factors into four categories that may affect student satisfaction and perceived learning in online classes, including 1) course organization, 2) student engagement, 3) learner interaction, and 4) instructor presence. Bolliger (2004) suggested the use of an online survey (OCSS) to evaluate student satisfaction with online course delivery, which included six distinct factors: 1) instructor, 2) technology, 3) course management, 4) course website, 5) interactivity, and 6) general issues.

Previous Literature Studied the Factors for the Traditional Degree Programs

On the other hand, previous research also studied the factors that affect student satisfaction in traditional face-to-face degree programs. For instance, Letcher and Neves (2010) adopted eight factors from the Undergraduate Business Exit Assessment (UBEA) to evaluate student satisfaction in a traditional face-to-face business degree program. Those factors are 1)

self-confidence, 2) curriculum, instruction, and classes, 3) satisfaction with teaching in subject matter, 4) extra-curricular activities and career opportunities, (5) advising, (6) quality of teaching and feedback, (7) computing resources, and (8) fellow students.

Sears et al. (2017) identified ten factors as predictors of student satisfaction in a traditional face-to-face psychology undergraduate program. The ten factors are 1) quality of teaching in lectures, 2) quality of teaching in labs, 3) student-faculty interaction, 4) level of academic challenge, 5) opportunities for research experience, 6) variety of courses available, 7) opportunities for class discussions, 8) opportunities to write about views and ideas, 9) program advising, and 10) career information.

Blau et al. (2019) conducted the research in a traditional face-to-face business degree program, in which they classified the factors that affect student satisfaction into three categories: 1) background variables, 2) curriculum-related variables, and 3) professional development variables. The traditional classroom offers opportunities—often unavailable online—for students to engage with the instructor and their classmates. It allows a different set of predictors to evaluate student satisfaction.

A Shift to Focus on the Online Degree Programs

As suggested in the review above, previous literature on student satisfaction either focused on online course level factors or researched the factors for the traditional face-to-face degree programs. Fewer studies have integrated these two perspectives and targeted the factors influencing online degree programs. The growing trend in online education requires that the focus of research shift from traditional face-to-face programs to online degree programs. In this study, we summarize and propose a new conceptual framework containing the factors tailored to online degree programs based on existing literature.

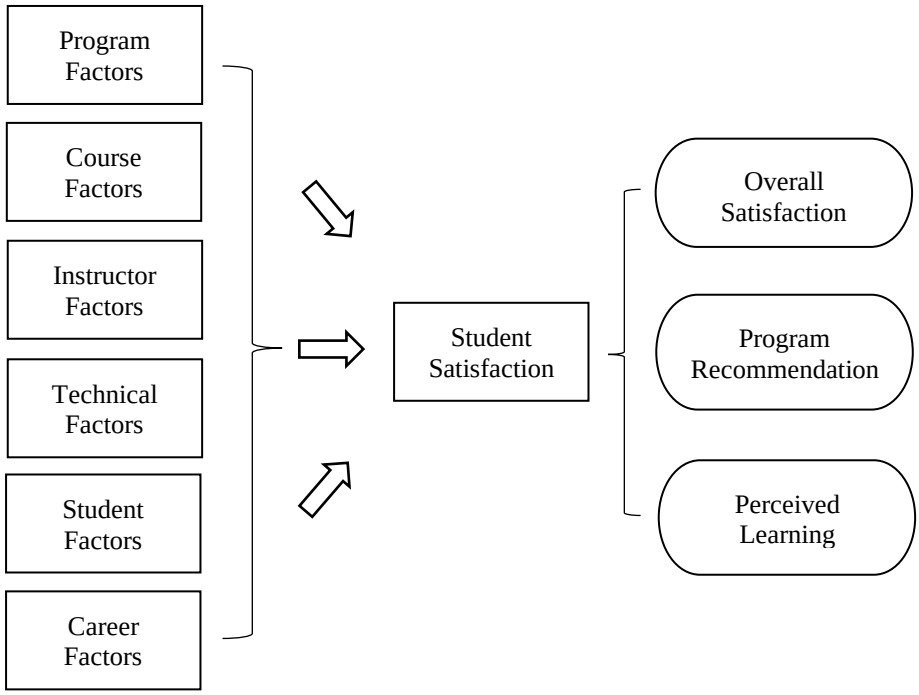
A New Conceptual Framework

Several studies have investigated the factors affecting student satisfaction with online degree programs. For instance, Freeman and Urbaczewski (2019) evaluated seven factors that affect student satisfaction with an online business degree program, including 1) course quality, 2) interactivity, 3) faculty, 4) learning style, 5) learning management systems (LMS), 6) course availability, and 7) advising. Kucuk and Richardson (2019) suggested that teaching presence, cognitive presence, emotional engagement, behavioral engagement, and cognitive engagement positively predicted student online learning satisfaction. Malik (2010) proposed a conceptual framework for student online learning satisfaction that identified five factors: 1) student factors, 2) instructor factors, 3) design factors, 4) course factors, and 5) technical factors.

In this study, we integrate and expand on the research listed above and propose a conceptual framework that consists of six categories, including 1) program factors, 2) course factors, 3) instructor factors, 4) technical factors, 5) student factors, and 6) job factors (Figure 1). These proposed factors and variables under each category are tailored explicitly to online degree programs and their importance and relevance will be reviewed in the following sections.

Figure 1

A Framework for Evaluating Online Degree Programs

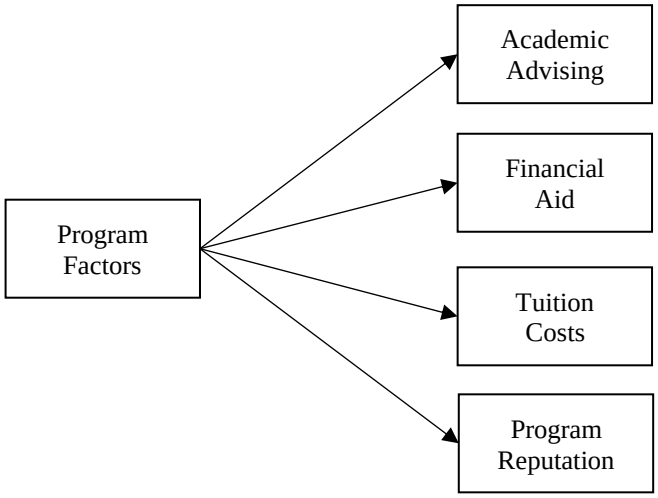


Program Factors

Program factors affect student satisfaction at the program level, such as academic advising, financial aid, tuition costs, and program reputation (Figure 2). These program-level factors are important because they provide fundamental support to online students from a broader perspective to help them achieve their academic goals or learning objectives during their studies (Farahmandian et al., 2013; Sears et al., 2017).

Figure 2

Program Factors



Previous research has studied these variables' effects on student satisfaction and provided evidence of the relationships between various program-related factors and student satisfaction. For instance, Sears et al. (2017) suggested that program advising was one of the predictors of student satisfaction in a large psychology undergraduate program. Freeman and Urbaczewski (2019) studied seven critical success factors for online program satisfaction, and advising was one of the seven factors. Farahmandian et al. (2013) found that advisory services, financial assistance, and tuition costs positively and significantly impacted student satisfaction. In another study, Khosravi et al. (2013) identified academic advising and financial aid effectiveness as two of the seven factors affecting higher education student satisfaction.

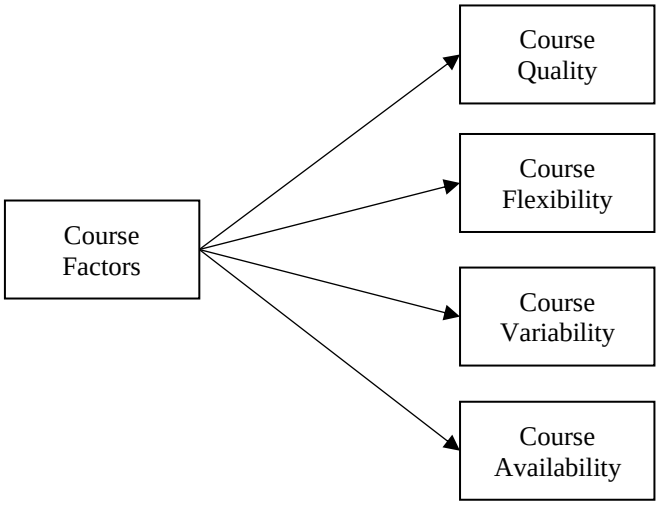
Additionally, Parahoo et al. (2016) found that university reputation was the most determinant predictor of student satisfaction in online learning. Al Hassani and Wilkins (2022) suggested that an institution's reputation significantly affects student satisfaction. Other factors, such as the facilities (Farahmandian et al., 2013) and campus life (Khosravi et al., 2013), may be attributed to the category of program factors as well but were eliminated from the investigation in this study because facilities and campus life may not apply to the online degree programs.

Course Factors

Course factors evaluate students' perceptions of course delivery, including course quality, flexibility, variability, and availability (Figure 3). Ensuring the quality of the course delivery is an important long-term strategy for higher education institutions and the key to the success of any online degree programs (Kucuk & Richardson, 2019), while making the online courses flexible, variable, and available may positively affect student satisfaction (Freeman & Urbaczewski, 2019; Letcher & Neves, 2010).

Figure 3

Course Factors



Several studies have provided evidence to support the classification of course factors. For instance, Letcher and Neves (2010) included course quality, variability, and availability within two of the eight factors in evaluating online student satisfaction. Freeman and Urbaczewski (2019) assessed the effects of course quality and availability on student satisfaction with the online degree program. Malik (2010) proposed that student satisfaction with online learning was positively influenced by course flexibility and course quality.

Past research often studied course factors in terms of various course interactions in individual online courses, such as learner-content interaction (LCI), learner-instructor interaction (LII), and learner-learner interaction (LLI) (Alqurashi, 2019; Kuo et al., 2014). This research focuses on online degree programs rather than individual online courses. We define course factors as those course-related variables positively affecting student satisfaction with the online degree program, such as course quality, flexibility, variability, and availability.

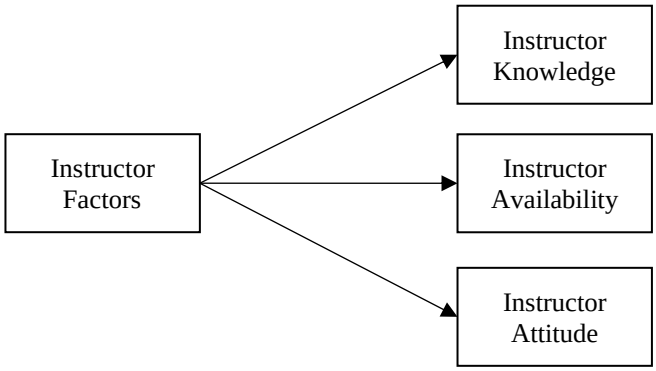
Specifically, course quality refers to students' overall perceptions regarding the quality of the courses, while course flexibility pertains to students' perceptions of the time flexibility of the courses offered. Course variability assesses students' perceptions regarding the breadth or variability of the courses offered, and course availability evaluates students' perceptions concerning the depth or the level of difficulties of the courses provided.

Instructor Factors

The instructor is often considered one of the critical factors in the success of online teaching activities (Roddy et al., 2017) because they can affect students' attitudes and motivation toward their learning behaviors (Cole et al., 2017; Gares et al., 2020). This study investigated three instructor-related factors that may affect student satisfaction with online degree programs, including instructor knowledge, instructor availability, and instructor attitude (Figure 4).

Figure 4

Instructor Factors



Instructor knowledge refers to the extent to which the instructor is knowledgeable of the subject matter and capable of coordinating the online students' learning activities using technology. It is believed to positively affect student satisfaction in traditional face-to-face and online education (Bolliger, 2004).

Instructor availability refers to how the instructor is available to provide assistance and timely response to the students when needed. It is critical because direct interaction between instructors and students is usually uncommon in an online learning environment (Freeman & Urbaczewski, 2019; Letcher & Neves, 2010).

Finally, instructor attitude refers to the instructors' friendly behaviors and understandability when dealing with potential issues with online students. It was suggested that instructors with a positive attitude were more likely to motivate the students, get along with them well, and positively influence student satisfaction (Gares et al., 2020).

Technical Factors

Compared to traditional degree programs, online education relies heavily on technology. Bolliger (2004) suggested that technology was vital in determining student satisfaction with online learning. Thus, it is crucial to study the effects of those technical factors on the success of online degree programs.

Learning management systems (LMS) are widely used in an online learning environment. LMS refers to the software applications used for the administration, documentation, tracking, reporting, automation, and delivery of online courses or learning programs (Ellis, 2009). Examples of LMS include educational platforms such as Canvas and Blackboard and video conferencing solutions such as Zoom and WebEx (Chaka, 2020).

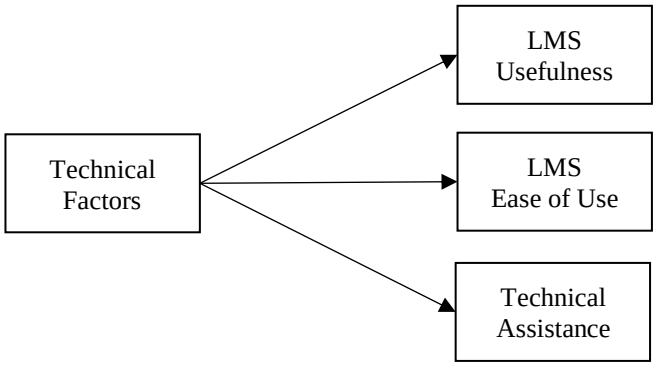
Some previous studies have investigated the importance of technology for student satisfaction. For instance, Freeman and Urbaczewski (2019) evaluated the effects of LMS on student satisfaction from six different aspects, including dashboard, software, uploading,

downloading, discussions, and assessments. Avcı and Ergün (2019) argued that online students more actively participating in LMS would improve academic performance. Malik (2010) proposed that the availability of technical assistance played an important role when online students encountered technical issues, and it may positively affect student satisfaction.

In this study, we incorporate the technology acceptance model (TAM) (Davis et al., 2020) and the variables suggested in previous literature to evaluate technical factors' effects on student satisfaction. The technological factors assessed in this research consist of three factors: LMS usefulness, LMS ease of use, and technical assistance (Figure 5). LMS usefulness evaluates students' perceptions regarding the efficiency and usefulness of the LMS in delivering online courses. LMS ease of use refers to the extent to which students feel the LMS is easy to use, and technical assistance assesses whether it is convenient to get technical help when having issues with the LMS.

Figure 5

Technical Factors



Student Factors

Online learning usually requires students to be more self-motivated and self-regulated and take more responsibilities and autonomy in learning activities than traditional face-to-face education, especially for students who take asynchronous online classes (Wong et al., 2019; Zhou & Wang, 2023). Thus, it is important to understand how student-related factors, such as students' personalities and experiences, affect student satisfaction in an online learning environment.

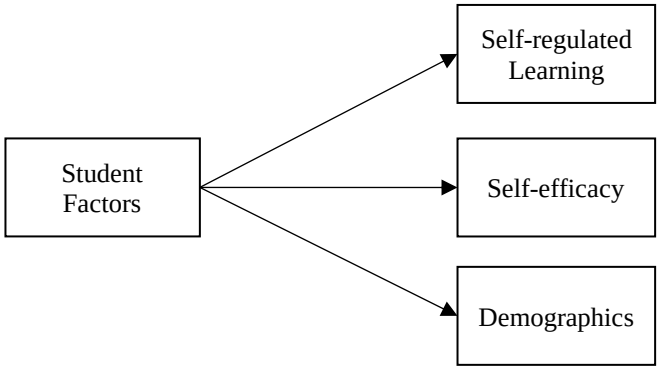
Many previous studies suggested that factors related to online students' personalities and experiences might affect student satisfaction positively. For instance, self-regulated learning and self-efficacy were two key factors frequently investigated in online learning literature (e.g., Alqurashi, 2019; Kuo et al., 2014).

Self-regulated learning refers to activities guided by metacognition, strategic action, and learning motivation. Self-regulated students are more likely to be self-motivated, set up plans

and goals, and take strategic actions to monitor and evaluate their learning progress (Moller & Huett, 2012).On the other hand, self-efficacy refers to a student's confidence level when they need to fulfill the requirements or achieve goals (Alqurashi, 2016). Students with a higher level of self-efficacy are more likely to make efforts and take the necessary steps to overcome challenges and obstacles, leading to better learning outcomes and higher satisfaction in the online learning environment (Alqurashi, 2019). Besides the abovementioned factors, students' experience or educational background may also affect their satisfaction with online degree programs (Li, 2019). This study defines students' demographic information as one of the student factors (Figure 6).

Figure 6

Student Factors



Career Factors

Career factors are those factors related to students' job searching, job placement, and career development. It is crucial to study the effects of career factors because students may seek job placements or potential promotion opportunities after graduation, and factors related to students' future careers may significantly impact their satisfaction with online degree programs (Letcher & Neves, 2010; Weerasinghe & Fernando, 2017).

Previous literature has investigated various career-related factors. For instance, Hanssen and Solvoll (2015) suggested that job prospects greatly influenced student satisfaction in countries with relatively low employment rates. Letcher and Neves (2010) found that career opportunities positively affected student satisfaction in an online business degree program. Sigala et al. (2006) proposed that student satisfaction heavily depended on job placement chances after graduation in Italian universities. Sears et al. (2017) included career information as one of the key predictors for student satisfaction in a large psychology undergraduate program.

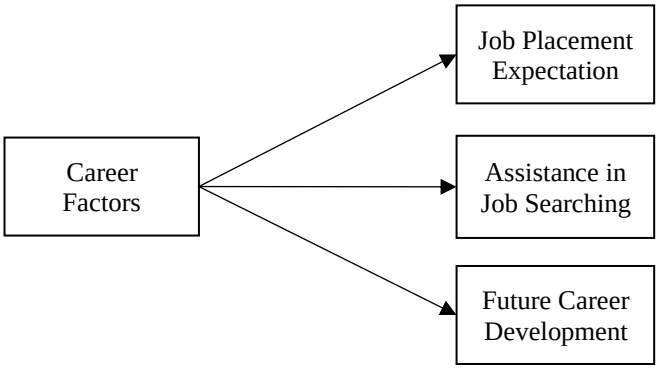
Blau et al. (2019) found that degree program satisfaction was positively associated with assistance in job searching, such as resume critiques, job search strategies, business etiquette, mock employer interviews, and internship opportunities. DeShields et al. (2005) suggested that

career development was one of the determinants of business students' satisfaction. This determinant is especially true for students with jobs while attending online degree programs because they might look for career development opportunities rather than job placement. In this case, students' perceptions of career development may significantly impact their online degree program satisfaction.

Based on the previous literature, we propose three career factors: job placement expectation, assistance in job searching, and future career development (Figure 7). Job placement expectation refers to whether the students feel optimistic or pessimistic about their future job placement. Assistance in job searching evaluates if the students can obtain enough help while searching for jobs during their studies. Future career development assesses whether the students feel optimistic or pessimistic about future career development opportunities (such as job changes or promotion opportunities) after they graduate from the programs.

Figure 7

Career Factors

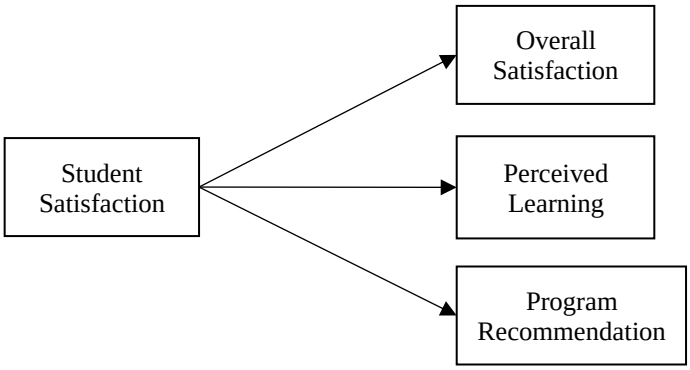


Student Satisfaction

Student satisfaction may be evaluated from different angles. For instance, Sears et al. (2017) suggested using two items to evaluate student satisfaction with the program. One measures overall satisfaction, and the other assesses the likelihood of recommending the program to others. Students may feel satisfied with the online degree program but unwilling to recommend it to others. On the other hand, students may indicate a good level of perceived learning but a lower level of satisfaction with the program. In this sense, perceived learning and program recommendation may be included as the additional dimensions under the construct of student satisfaction (Alqurashi, 2019; Blau et al., 2019; Sears et al., 2017). This study proposes three dimensions in evaluating student satisfaction: overall satisfaction, perceived learning, and program recommendation (Figure 8).

Figure 8

Student Satisfaction



Method

Design and Recruitment Procedures

Drawing upon the literature review and the proposed conceptual framework (Figure 1) in evaluating the online degree programs, the survey was developed regarding each of the six factors and student satisfaction. Qualtrics Online Survey Platform was used to house and deliver the survey to the potential respondents. To improve the quality of the responses, we also incorporated three attention-check questions in the survey.

The potential respondents were online students enrolled in two industrial engineering online degree programs (either graduate or undergraduate) at a 4-year public university in the southern region of the United States. The online degree programs have an average enrolment of 250 undergraduate and 25 graduate students over the past three years.

The research design and survey were developed and submitted to the Institutional Review Board (IRB). Upon the approval of the IRB, an email announcement was sent to all the online students enrolled in these two programs; it briefly described the purpose and procedure and the potential benefits and risks of the study to the students. All the online students were encouraged to participate in the survey to earn extra credits for their classes as a potential reward for their participation. The survey took about 15-20 minutes to complete, and the survey link from the Qualtrics Online Survey Platform was included in the email announcement.

Participants

A total of 229 responses were received, of which 158 were valid answers after screening the incomplete responses and the three attention-check questions. Of these 158 students, 40 were females, and 115 were males; the other three preferred not to answer. Most of the students came

from the undergraduate online degree program (81.6%), aged between 25 to 44 years old (71.5%), and identified their culture as English-speaking (69%) and ethnicity as Caucasian (65.2%). Concerning the student type, 93 were transfer students, 38 were returning students, and 27 were in the "other" category. The prior online learning experience across these 158 students varied, with 22.2% indicating no experience and 25.9% suggesting over ten online courses completed before entering the program. Only a small number of students earned bachelor's degrees or above (18.4%) and had a GPA below 3.0 (12%). A detailed summary of demographic information is presented in Table 1.

Table 1

Demographic Information

Characteristics		N	%
Variables	Category		
Gender	Female	40	25.3
	Male	115	72.8
	Prefer not to answer	3	1.9
Age	15-24	29	18.4
	25-34	57	36.1
	35-44	56	35.4
	45-54	11	7.0
	55+	3	1.9
	Prefer not to answer	2	1.3
Ethnicity	Caucasian	103	65.2
	African American	29	18.4
	Latino or Hispanic	6	3.8
	Asian	6	3.8
	Native American	1	0.6
	Two or More	7	4.4
	Other/Unknown	1	0.6
	Prefer not to answer	5	3.2
Culture	African-Islamic	3	1.9
	Baltic	2	1.3
	Catholic Europe	11	7.0
	English Speaking	109	69.0
	Latin America	3	1.9
	Orthodox Protestant Europe	5	3.2
	South Asia	3	1.9
	Other/Unknown	12	7.6
	Prefer not to answer	10	6.3
Degree Program	Undergraduate Program	129	81.6
	Graduate Program	6	3.8
	Other Undergraduate Programs	23	14.6
Semester Enrolled	First Semester	30	19.0
	Second Semester	12	7.6
	Third Semester	19	12.0
	Fourth Semester	15	9.5
	Fifth Semester	12	7.6
	Sixth Semester	19	12.0
	More than Six Semesters	51	32.3
Student Type	Transfer Student	93	58.9
	Returning Student	38	24.1
	Other	27	17.1

Online Learning Experience	Completed less than 5 online courses before joining the program	50	31.6
	Completed 5 - 10 online courses before joining the program	32	20.3
	Completed more than 10 online courses before joining the program	41	25.9
	No online courses were taken before joining the program	35	22.2
Degree Earned Before Joining the Program	Some college credit, no degree	43	27.2
	Associate's degree	73	46.2
	Bachelor's degree	21	13.3
	Master's degree	8	5.1
	Other	13	8.2
Current GPA	Above 3.5	87	55.1
	Between 3.0 to 3.5	52	32.9
	Below 3.0	19	12.0
Total		158	100.0

Measures

Dependent Variables

In this study, we proposed three dimensions (dependent variables) to assess student satisfaction with online degree programs, including overall satisfaction, perceived learning, and program recommendation. The survey question for overall satisfaction was "Please rate your overall satisfaction with your experience in the program using a 5-point scale ranging from extremely satisfied to extremely dissatisfied." The one for program recommendation was "How likely are you to recommend the program to others using a 5-point scale ranging from extremely likely to extremely unlikely". Perceived learning was measured through one item revised based on Sebastianelli et al. (2015) research, "Please indicate your perceived learning from the degree program using a 5-point scale ranging from far exceeds expectations to far short of expectations."

Independent Variables

The independent variables were divided into two categories: demographic and non-demographic. The demographic variables were categorical variables regarding students' background information as described in the previous section, including age, ethnicity, culture, degree program, semester enrolled, student type, online learning experience, degree earned before joining the program, and current GPA (Li, 2019). The demographic information was classified as one of the student factors in our research framework (Figure 6).

The non-demographic variables referred to the continuous variables included in each of the six categories: 1) program factors, 2) course factors, 3) instructor factors, 4) technical factors, 5) student factors, and 6) job factors.

Program factors included academic advising, financial aid, tuition costs, and program reputation. Based on previous literature, we adopted one item to evaluate each of the four program factors (Farahmandian et al., 2013; Khosravi et al., 2013). The sample item was "Please rate your satisfaction with the academic advising of the program using a 5-point scale ranging from extremely satisfied to extremely dissatisfied."

Course factors consisted of course quality, course flexibility, course variability, and course availability. Like the program factors, we used one item to measure each course factor (Freeman & Urbaczewski, 2019; Letcher & Neves, 2010). One sample item was "Please rate your satisfaction with the overall quality of the courses offered using a 5-point scale ranging from extremely satisfied to extremely dissatisfied."

Instructor factors included instructor knowledge, instructor availability, and instructor attitude. We applied one item from Bolliger (2004) to measure instructor knowledge, two items from Freeman and Urbaczewski (2019) to assess instructor availability, and two items from Volery and Lord (2000) to evaluate instructor attitude. One sample survey item was "Please indicate the level of agreement with the following statement using a 5-point scale ranging from strongly agree to strongly disagree: Instructors are knowledgeable about their respective disciplines."

Technical factors included LMS usefulness, ease of use, and technical assistance. One item was used to assess each technical factor (Freeman & Urbaczewski, 2019). A sample item was written as "Please indicate the level of agreement with the following statement using a 5-point scale ranging from strongly agree to strongly disagree: Overall, the learning management system (Canvas) is easy to use."

Student factors included self-regulated learning, self-efficacy, and students' demographic data. We adopted two separate measures to evaluate self-regulated learning and self-efficacy, respectively. First, one survey question was employed based on the previous literature (Alqurashi, 2019; Kuo et al., 2014). The sample question for self-regulated learning was "Please indicate the level of agreement with the following statement using a 5-point scale ranging from strongly agree to strongly disagree. I am a self-motivated and self-regulated learner for online classes." Secondly, we implemented a 24-item QSLQ survey developed by Barnard et al. (2009) and an 8-item OLSE survey suggested by Alqurashi (2019) to validate self-regulated learning (QSLQ) and online learning self-efficacy (OLSE). The results of QSLQ and OLSE were highly correlated to that of the first measure. Thus, we took the average of these two measures for self-regulated learning and self-efficacy ratings.

Career factors comprised job placement expectation, assistance in job searching, and future career development. One survey item was used to measure each of the three career factors, respectively (Blau et al., 2019; DeShields et al., 2005; Sigala et al., 2006). A sample item was "Please rate your satisfaction with the job placement after you finish the program using a 5-point scale ranging from extremely satisfied to extremely dissatisfied."

In addition to the 5-point Likert scale, we added one "not applicable" option to each survey question because some factors, such as financial aid and technical assistance, may not apply to all students. For instance, those who have never considered financial aid or technical assistance may select "not applicable" to this question. Whenever "not applicable" was chosen, it was coded as three, the same as "neither agree nor disagree" on the 5-point Likert scale. Please refer to the Appendix for a complete list of survey questions.

Statistical Analysis

The proposed conceptual framework included six factors: program factors, course factors, instructor factors, technical factors, student factors, and career factors. Different variables were listed within each of these six factors, and the measurement for each of the variables was developed (see Appendix). In general, there were ten demographic variables (categorical variables) such as gender, age, ethnicity, culture, etc. (Table 1) and 19 non-demographic variables (continuous variables) such as academic advising, course quality, instructor knowledge, etc.

Demographic and non-demographic variables' effects on student satisfaction (overall satisfaction, perceived learning, and program recommendation) were evaluated separately. To test the effects of 19 non-demographic variables on student satisfaction, structural equation modeling and path analysis were initially used for the data analysis (Kline, 2015). However, the confirmatory factor analysis (CFA) results did not indicate a good fit for the measurement model, suggesting that using structural equation modeling and path analysis might not be appropriate. Thus, multiple linear regression analysis was employed to evaluate the effects of non-demographic variables on student satisfaction.

To evaluate the effects of demographic variables on student satisfaction, we applied univariate analysis. In addition, we dummy-coded demographic variables into the multiple linear regression models to test the collective effects of both demographic and non-demographic variables. Finally, paired-comparison t-tests were performed to evaluate the difference among three dependent variables regarding student satisfaction (Denis, 2018). IBM SPSS 28 was used for the data analysis.

Results

Zero-Order Correlation Matrix and Measurement Model

We first constructed the zero-order correlation matrix between the non-demographic (continuous) variables and three dependent variables (overall satisfaction, perceived learning, and program recommendation). The results suggested that all 19 non-demographic variables were significantly correlated with three dependent variables, indicating that each may significantly contribute to the variations in overall satisfaction, perceived learning, and program recommendation (Table 2).

Table 2

Zero-Order Correlation Matrix

Variables	Mean	S.D.	Overall Satisfaction	Perceived Learning	Program Recommend	Academic Advising	Financial Aid	Tuition Costs	Program Reputation	Course Quality	Course Flexibility	Course Variability	Course Availability
Overall Satisfaction	4.39	.812	1										
Perceived Learning	3.63	.855	.637**	1									
Program Recommend	4.39	.895	.702**	.614**	1								
Academic Advising	4.55	.692	.458**	.409**	.462**	1							
Financial Aid	3.78	1.073	.330**	.275**	.208**	.341**	1						
Tuition Costs	3.44	1.085	.426**	.307**	.312**	.292**	.504**	1					
Program Reputation	4.24	.825	.697**	.614**	.613**	.347**	.455**	.456**	1				
Course Quality	4.23	.904	.718**	.606**	.610**	.393**	.368**	.432**	.633**	1			
Course Flexibility	4.57	.726	.457**	.349**	.370**	.437**	.224*	.244**	.408**	.426**	1		
Course Variability	4.27	.849	.530**	.472**	.521**	.481**	.428**	.310**	.569**	.538**	.542**	1	
Course Availability	4.20	.927	.652**	.590**	.644**	.407**	.318**	.299**	.646**	.659**	.514**	.668**	1

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
Sample Size N = 158

Table 2

Zero-Order Correlation Matrix (continued)

Variables	Mean	S.D.	Overall Satisfaction	Perceived Learning	Program Recommend	Instructor Knowledge	Instructor Availability	Instructor Attitude	LMS Ease of Use	LMS Usefulness	Technical Assistance
Overall Satisfaction	4.39	.812	1								
Perceived Learning	3.63	.855	.637**	1							
Program Recommend	4.39	.895	.702**	.614**	1						
Instructor Knowledge	4.45	.921	.661**	.535**	.596**	1					
Instructor Availability	4.38	.885	.542**	.435**	.480**	.643**	1				
Instructor Attitude	4.45	.790	.592**	.439**	.546**	.500**	.708**	1			
LMS Ease of Use	4.68	.587	.271**	.325**	.274**	.335**	.253**	.281**	1		
LMS Usefulness	4.67	.535	.339**	.375**	.352**	.367**	.328**	.352**	.741**	1	
Technical Assistance	3.92	1.013	.307**	.446**	.370**	.296**	.256**	.262**	.291**	.342**	1

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
Sample Size N = 158

Table 2

Zero-Order Correlation Matrix (continued)

Variables	Mean	S.D.	Overall Satisfaction	Perceived Learning	Recommend Program	Self-Regulated Learning	Self-Efficacy	Job Search Assistance	Job Placement	Career Development
Overall Satisfaction	4.39	.812	1							
Perceived Learning	3.63	.855	.637**	1						
Program Recommend	4.39	.895	.702**	.614**	1					
Self-Regulated Learning	4.22	.545	.315**	.375**	.346**	1				
Self-Efficacy	4.57	.567	.209**	.183*	.202*	.669**	1			
Job Search Assistance	3.42	.883	.245**	.323**	.275**	.198*	-.031	1		
Job Placement Expectation	3.99	.987	.305**	.314**	.342**	.220**	.162*	.398**	1	
Future Career Development	4.20	.949	.460**	.390**	.498**	.252**	.166*	.377**	.742**	1

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
Sample Size N = 158

Next, confirmatory factor analysis (CFA) was used to evaluate the measurement model in our research framework. There were six factors in the measurement model, including program, course, instructor, technical, student, and career factors. The model fit indices showed that the value of CMIN/DF was less than 3.0, and both TLI and CFI values were above .90, indicating an acceptable fit between the hypothetical model and sample data. In addition, the RMSEA value was less than .08, and the PCLOSE value was greater than .05, further providing evidence of a close model fit (Kline, 2015).

Concerning the standardized regression weights, all factor loadings were positive and statistically significant. Research suggested that a factor loading above .70 was ideal, but an item can still be retained with a loading of .40 or above as long as the average variance explained was greater than .50 (Hair Jr et al., 2021). A summary of the model fit indices and the factor loading values are presented in Table 3.

The results of the factor loadings suggested that the latent variables loaded well on the course and instructor factors. In contrast, technical and career factors had poorly loaded items, such as technical assistance (.39) and job placement expectation (.44). Due to these poorly loaded items, treating 19 non-demographic variables as latent variables for each of the six categories may not be appropriate. As a result, structural equation modeling and path analysis were not used for further data analysis. Instead, multiple regression analysis was employed to evaluate the effects of non-demographic variables on three dependent variables.

Table 3

Confirmatory Factor Analysis for the Measurement Model

Model fit indices						
	CMIN/DF	TLI	CFI	RMSEA	PCLOSE	
	1.571	.931	.946	.060	.139	
Factor loadings						
Factors	Program factors	Course factors	Instructor factors	Technical factors	Student factors	Career factors
Academic advising	.65					
Financial aid	.53					
Tuition costs	.51					
Program reputation	.85					
Course quality		.80				
Course flexibility		.61				
Course variability		.81				
Course availability		.82				
Instructor knowledge			.85			
Instructor availability			.78			
Instructor attitude			.90			
LMS usefulness				.80		

LMS ease of use	.92			
Technical assistance	.39			
Self-regulated learning		1.00		
Self-efficacy		.62		
Job placement expectation				.44
Job searching assistance				.81
Career development				.91

The Effects of Demographic Variables on Three Dependent Variables

Demographic variables were considered part of the student factors in our research framework. The effects of demographic variables on three dependent variables were evaluated separately from non-demographic (continuous) variables because they were categorical data. We applied univariate analysis in SPSS to test the effects of each demographic variable on three dependent variables individually (Table 4). Because some categories had a small sample size, we regrouped and recoded the data for those demographic variables. For instance, there were only five respondents in the last two "age" categories, and we regrouped "age" into four categories instead of six. In addition, 69% of the respondents identified their "culture" as "English-speaking," and thus, "culture" was recoded into two groups as "English-speaking" and "other." Most respondents identified themselves as "Caucasian" or "African American," and the variable of "ethnicity" was therefore regrouped into three categories.

Table 4

The Effects of Demographic Variables on Three Dependent Variables

Dependent Variables	Demographic Variables	Category	N	Mean	S.D.	F statistics	P value
Overall Satisfaction	Program Enrolled	Undergraduate Program	129	4.44	.770	1.900	.153
		Graduate Program	6	4.33	.816		
		Other Undergraduate Programs	23	4.09	.996		
Perceived Learning		Undergraduate Program	129	3.67	.849	1.609	.203
		Graduate Program	6	3.83	.983		
		Other Undergraduate Programs	23	3.35	.832		
Program Recommendation		Undergraduate Program	129	4.54	.729	12.408	<.001**
		Graduate Program	6	4.17	.983		
		Other Undergraduate Programs	23	3.61	1.270		
Overall Satisfaction	Degree Earned	No degree	43	4.42	.731	6.098	<.001**
		Associate	73	4.44	.707		

	Bachelor	21	4.43	.676		
	Master	8	3.13	1.553		
	Other	13	4.69	.630		
Perceived Learning	No degree	43	3.67	.919	3.821	.005*
	Associate	73	3.60	.740		
	Bachelor	21	3.86	.793		
	Master	8	2.63	1.408		
	Other	13	3.92	.494		
Program Recommendation	No degree	43	4.23	1.065	5.191	<.001**
	Associate	73	4.48	.648		
	Bachelor	21	4.62	.590		
	Master	8	3.25	1.753		
	Other	13	4.77	.599		

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
Sample Size N = 158

The results were presented in Table 4, suggesting that most demographic variables did not significantly affect three outcome variables, except for "program enrolled" and "degree earned." Specifically, the students enrolled in our undergraduate and graduate programs indicated a relatively strong preference in recommending the program to other people (Mean = 4.54, SD = .729 and Mean = 4.17, SD = .983) compared to the students from other undergraduate programs (Mean = 3.61, SD = 1.270) who took the courses as their electives ($F = 12.408$, $p < .001$). In addition, those who earned master's degrees before enrollment provided significantly lower ratings in terms of all three outcome variables, including overall satisfaction (Mean = 3.13, SD = 1.553 vs. Mean = 4.39, SD = .812, $p < .001$), perceived learning (Mean = 2.63, SD = 1.408 vs. Mean = 3.63, SD = .855, $p < .05$), and program recommendation (Mean = 3.25, SD = 1.753 vs. Mean = 4.39, SD = .895, $p < .05$).

To further control the impacts of non-demographic variables, we incorporated those variables as covariates into the univariate model and retested the effects of "program enrolled" and "degree earned" on three dependent variables. The results from the adjusted estimates suggested that after controlling for the non-demographic variables, the students in our undergraduate programs still indicated a relatively strong preference in recommending the program (Mean = 4.49, SD = .048) compared to those from other undergraduate programs (Mean = 3.90, SD = .123) who took the courses as their electives ($F = 9.505$, $p < .001$).

However, this was not the case for the students in our graduate program (Mean = 4.28, SD =.233). For "degree earned," students with master's degrees before entering our program indicated significantly lower ratings for overall satisfaction (Mean = 3.95, SD = .189 vs. Mean = 4.34, SD = .052, $p < .05$) and program recommendation (Mean = 3.99, SD = .229 vs. Mean = 4.37, SD = .063, $p < .05$), but not for perceived learning (Mean = 3.38, SD = .248 vs. Mean = 3.63, SD = .068, $p > .10$).

The Effects of Non-Demographic Variables on Three Dependent Variables

Non-demographic variables were measured on a 5-point Likert scale and considered continuous variables. Our research framework included 19 non-demographic variables: four in program and course factors, three in instructor, technical, and career factors, and two in student factors. The zero-order correlation matrix suggested that all 19 non-demographic variables were significantly correlated with three dependent variables, indicating that each may individually contribute to overall satisfaction, perceived learning, and program recommendation.

We used multiple linear regression to evaluate the collective impacts and identify the significant factors within these 19 variables. Three separate multiple linear regressions were performed on three dependent variables. In the first model, overall satisfaction was the dependent variable, while the other 19 non-demographic variables were the independent variables. At the same time, perceived learning and program recommendation were the dependent variables for models 2 and 3 (Table 5).

Table 5

The Effects of Non-Demographic Variables on Three Dependent Variables

Model	Dependent Variable	Independent Variables	R square	Adjusted R square	F statistics	P value	
Model 1	Overall Satisfaction	All Non-Demographic Variables	.714	.675	18.151	<.001**	
		Parameter Estimates with Robust Standard Errors					
		Significant IVs	Coefficient	Robust Std. Error	t statistics	P value	Partial Eta Squared
		Program Reputation	.297	.096	3.109	.002*	.065
		Course Quality	.221	.094	2.359	.020*	.039
		Instructor Knowledge	.226	.118	1.914	.058	.026
Model 2	Perceived Learning	All Non-Demographic Variables	.562	.502	9.331	<.001**	
		Parameter Estimates with Robust Standard Errors					
		Significant IVs	Coefficient	Robust Std. Error	t statistics	P value	Partial Eta Squared
		Technical Assistance	.144	.065	2.220	.028*	.034
		Course Quality	.221	.106	2.072	.040*	.030
		Program Reputation	.214	.107	1.998	.048*	.028

Model 3	Program Recommendation	All Non-Demographic Variables	.643	.594	13.099	<.001**	
		Parameter Estimates with Robust Standard Errors					
		Significant IVs	Coefficient	Robust Std. Error	t statistics	P value	Partial Eta Squared
		Financial Aid	-.178	.052	-3.411	<.001**	.078
		Course Depth	.238	.099	2.397	.018*	.040
		Career Development	.206	.098	2.101	.037*	.031

**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).
Sample Size N = 158

Testing the potential collinearity issues and the four linear regression analysis assumptions is essential for multiple linear regression analysis. The assumptions include linearity, homoskedasticity, independence, and normality (Darlington & Hayes, 2016). The results from the collinearity test showed that all VIF values were less than 3, suggesting no evidence for the collinearity issue. In addition, the histogram and normal P-P plot indicated no clear evidence of fairly extreme non-normality in the residuals. Further investigation in studentized residual plots indicated that the linearity assumption was not violated (Pituch & Stevens, 2015). Moreover, the assumption of independence might not be an issue since the dependent variables in this study were not measured on one or more cases over time (Fidell & Tabachnick, 2018).

The modified Breusch-Pegan test and White's test were performed to evaluate the homoskedasticity assumption for the multiple linear regression. The results of the modified Breusch-Pegan test for the first and third models were significant, suggesting that there might be evidence of heteroskedastic residuals. To overcome the issue of heteroskedasticity, we retested the multiple linear regression models using the parameter estimates with robust standard errors, which were considered heteroskedasticity-consistent standard errors (Astivia & Zumbo, 2019). The results indicated that program reputation ($\beta = .297$, $p = .002$) and course quality ($\beta = .221$, $p = .020$) were the significant factors affecting overall satisfaction, while instructor knowledge ($\beta = .226$, $p = .058$) was marginally significant in model 1. In model 3, financial aid ($\beta = -.178$, $p = .001$), course depth ($\beta = .238$, $p = .018$), and career development ($\beta = .206$, $p = .037$) significantly affected program recommendation.

For model 2, the modified Breusch-Pegan and White's test results were insignificant, suggesting no evidence of heteroskedastic residuals. Both the parameter estimates with and without robust standard errors indicated that program reputation ($\beta = .214$, $p = .048$), course quality ($\beta = .221$, $p = .040$), and technical assistance ($\beta = .144$, $p = .028$) had significant effects on perceived learning. The adjusted R^2 for the three models were .675, .502, and .594, respectively. A summary of the results is shown in Table 5.

The Effects of Both Demographic and Non-Demographic Variables on Three Dependent Variables

To test the collective effects of demographic and non-demographic variables, we dummy coded two demographic variables (degree earned and program enrolled) identified as significant in previous analysis and incorporated these two categorical variables into three multiple linear regression models. After entering these two dummy variables, program reputation ($\beta = .273$, $p = .011$) and course quality ($\beta = .200$, $p = .049$) were still the significant factors for overall satisfaction in model 1.

However, instructor knowledge was not marginally significant ($\beta = .205$, $p = .104$). In model 2, technical assistance ($\beta = .157$, $p = .027$) was still significant, but program reputation ($\beta = .210$, $p = .080$) and course quality ($\beta = .181$, $p = .112$) did not significantly affect perceived learning. For model 3, financial aid ($\beta = -.125$, $p = .015$), course availability ($\beta = .228$, $p = .015$), and career development ($\beta = .171$, $p = .026$) still significantly affected program recommendation after incorporating these two dummy variables. In all three multiple regression models, two dummy coded variables (degree earned and program enrolled) were not statistically significant on three dependent variables.

The Significant Difference Among Dependent Variables

Paired-comparison t-tests were performed to evaluate the difference among three dependent variables. The results suggested that the average rating of perceived learning was significantly lower than that of overall satisfaction or program recommendation (Table 6). To explore the potential causes leading to the lower average rating of perceived learning, we created two new dependent variables, d_1 and d_2, where d_1 represented the difference between overall satisfaction and perceived learning, and d_2 referred to the difference between program recommendation and perceived learning. The multiple linear regression models were used to assess the effects of both demographic and non-demographic variables on d_1 and d_2. The results suggested that self-regulated learning was the significant factor for both d_1 ($\beta = -.427$, $p = .020$) and d_2 ($\beta = -.375$, $p = .045$).

Table 6

Paired Comparison t-Tests Among Three Dependent Variables

Dependent Variable	N	Mean	S.D.	Paired comparison t-tests	Mean difference	S.D.	t statistics	P value
Overall Satisfaction	158	4.39	.812	Overall Satisfaction vs. Perceived Learning	.753	.711	13.315	<.001**
Perceived Learning	158	3.63	.855	Overall Satisfaction vs. Program Recommendation	.006	.663	.120	.905
Program Recommendation	158	4.39	.895	Program Recommendation vs. Perceived Learning	.759	.769	12.413	<.001**

**Correlation is significant at the 0.01 level (2-tailed).

Discussion

Implication One: Propose a Conceptual Framework for Evaluating Online Degree Program

The first goal of this study is to propose a conceptual framework for evaluating the online degree program. We proposed a conceptual framework comprising six categories based on the existing literature to achieve this objective. The six categories included program factors, course factors, instructor factors, technical factors, student factors, and job factors. Following a thorough literature review, various sub-factors were identified within each of the six categories. Aside from ten demographic variables, 19 non-demographic variables were suggested for evaluating the online degree program. The measurement for each demographic and non-demographic variable was also proposed based on previous literature.

In addition to the six-category framework, we proposed three outcome variables as the dependent variables for evaluating the online degree program from students' perspectives, including overall satisfaction, perceived learning, and program recommendation. The results from the zero-order correlation matrix suggested that all 19 non-demographic factors were significantly correlated with three dependent variables, supporting the use of our proposed framework to evaluate online degree programs.

To further evaluate the measurement model proposed, a confirmatory factor analysis (CFA) was conducted to extract the factor loadings on six different categories. The overall model fit indices suggested that the measurement model was acceptable regarding the relationship between the hypothetical model and sample data. However, the factor loadings results showed that most categories did not have decent loadings across different latent variables. The measurement model may need further improvement, and we used multiple regression models to assess the effects of demographic and non-demographic variables. In summary, the proposed framework may provide a valuable portfolio for evaluating online degree programs from students' perspectives.

Implication Two: Identify Key Factors in Evaluating Online Degree Programs Through Student Satisfaction

The second goal of this study is to identify the critical factors in evaluating online degree programs through student satisfaction. Based on our proposed framework, we collected the responses from the college students in two engineering online programs and used multiple regression models to test the effects of various demographic and non-demographic variables on three outcome variables (overall satisfaction, perceived learning, and program recommendation). The following discussion lists key variables identified from the data analysis.

Program Enrolled

Concerning the demographic variables, only "program enrolled" and "degree earned" significantly impacted three outcome variables. Specifically, the students enrolled in our undergraduate program seemed more inclined to recommend the program to others than those from other programs for elective courses. The possible explanation was that the students enrolled in our program were generally satisfied, given the relatively high ratings (4.39 out of 5) for overall satisfaction and program recommendation. However, since there was no significant

difference in overall satisfaction and perceived learning among the students enrolled in different programs, this implication should be treated cautiously. The actual effect of "program enrolled" may be limited.

Degree Earned

Aside from "program enrolled," the students who earned master's degrees before joining the online degree program suggested a fairly consistent lower overall satisfaction and program recommendation ratings. The plausible explanation was that those who had already obtained a high-level degree might be more likely to have higher expectations and less likely to feel satisfied and recommend the program to others. However, considering the small number of students who earned master's degrees in our sample, further validation is needed for this implication.

Program Reputation

Key non-demographic variables were identified in three dependent variables besides the demographic variables listed above. Specifically, program reputation and course quality were the main contributors to the variations in overall satisfaction, whereas technical assistance was the significant factor for perceived learning. The most critical factors affecting the program recommendation were financial aid, course depth, and career development. Though the above results were generated based on the sample collected in two specific online degree programs, they may still have meaningful implications.

Online students usually perceive the program's reputation as one of the keys because it may affect their initial expectations or future job applications. For instance, the students were asked if they had any additional comments at the end of the survey. One student stated, "This was my first degree. I am extremely satisfied with the program. I like the fact that the program is ABET certified." The other one suggested, "Being an online student in the program, I am afraid that I will have to transfer out due to the school losing its ABET accreditation for the program." In this regard, it would be beneficial if efforts could be made to promote the reputation of online degree programs, such as obtaining the program certification from prestigious accreditations.

Course Quality

Course quality refers to students' overall perceptions regarding the quality of the courses, which is often considered the key to any online degree program. One student suggested in her additional comments, "The quality of my courses has varied greatly. Some classes have been exceptional, while others have been atrocious. Some standardization for the courses within the program would be very beneficial." Another one mentioned, "I have been incredibly disappointed with the quality of education in this program. I have really only 1 or 2 quality classes."

Improving the overall quality of courses is usually challenging because different instructors may teach the classes differently. Especially in asynchronous online programs, most of the lectures are pre-recorded, and some instructors may fail to update the lecture videos in a timely manner. Therefore, it is crucial to implement specific standards for online courses. For instance, introducing and incorporating the standards suggested by Quality Matters (QM) or the Association of College and University Educators (ACUE) may be a good option.

Technical Assistance

Technical assistance refers to whether it is convenient for online students to get the proper assistance when having trouble with the learning management system (LMS). It is crucial for those new to the online program and unfamiliar with LMS. Many students indicated an excellent learning experience using the Canvas LMS during their studies. For instance, one student suggested, "I feel that Canvas is a simple and easy program or platform to use, much simpler and more user-friendly than other platforms I have seen compared to other students from other universities." Another stated, "I feel that the Canvas system overall is designed perfectly for the user to be as successful as possible."

However, the data analysis results suggested that technical assistance was the key contributor to the variation of perceived learning among online students. Likely, students needing help with LMS did not receive proper assistance, which may result in poor learning experiences among those students. In dealing with this issue, proper training for using LMS may be provided, and resources regarding technical assistance should be announced once the students are enrolled in the online degree program.

Financial Aid

One of the interesting implications of the data analysis was the effect of financial aid on program recommendation. The results suggested that financial aid significantly contributed to the variation in program recommendation. In addition, it affected program recommendation in a reverse way ($\beta = -.178$, $p < .001$). It was probably because most students in our program did not receive financial aid and provided low ratings on this item. In other words, though they might not be satisfied with the financial aid provided, they were still willing to recommend the program to others, contrary to our expectations. Financial aid might be essential when students apply for the online degree program. However, when students entered the program, this might not significantly affect their overall satisfaction, perceived learning, and willingness to recommend the program.

Course Availability

Course availability refers to the depth or the level of difficulties of the courses offered. When the course lacks challenges, it is likely that the students are not satisfied with the learning outcomes. On the other hand, if the course is too challenging, the students may feel overwhelmed with learning.

For instance, one student suggested, "The online Calculus II class is by far the most difficult course I have ever taken, and it is my understanding that there is only one professor who teaches that course online. I think it would be helpful to online students if there were more professor options. Not everyone will learn Calculus II the way that the professor teaches." Another student mentioned, "There are two classes specifically that I have found extremely challenging: the computer science class with lab and the Calculus II class. They are extremely difficult, and the failure rate seems far too high for the number of students putting forth legitimate effort."

The results of the data analysis indicated that the students who were more satisfied with the level of difficulty of the courses were more likely to recommend the program to others. It

was an important finding that setting the proper difficulty level for course design and development was crucial and imperative. Therefore, we recommend that the courses' depth be tailored to the average level of students enrolled in the online degree program.

Future Career Development

Future career development refers to the students' expectations regarding future career opportunities, such as job change and promotion opportunities. We proposed three career factors: job placement, job searching assistance, and future career development. The results suggested that students might value future career development rather than the other two factors. It was probably because most students in online programs were non-traditional students. One of the primary reasons students choose to study in an online program is that they may have more flexibility in making time arrangements to accommodate their daily job responsibilities.

Most students enrolled in our program were working professionals who not only expected to receive a higher-level degree but also expanded their knowledge base in their professional field and sought opportunities for their future career development. In this sense, assistance in job searching or job placement expectation might be a minor consideration for these non-traditional students. In addition, traditional higher education might focus more on teaching fundamental theories in various domains rather than emphasizing the importance of practices and applications. We suggest online degree programs focus more on practical knowledge when designing and developing the curriculum. It may better align the course delivery with the students' expectations for future career development.

Implication Three: Propose Three Dimensions of Student Satisfaction and Assess the Differences Among Them

Another potential contribution of this study is to propose three dimensions of student satisfaction and assess the differences among them. Evaluating student satisfaction from different perspectives and identifying the causes that may lead to potential inconsistencies is crucial. In this study, we proposed three dimensions of student satisfaction in our research framework: overall satisfaction, perceived learning, and program recommendation. In addition, the differences among these three dimensions were assessed, and the key factor affecting the differences was identified.

Self-Regulated Learning

The results from the data analysis suggested that the average rating of perceived learning was significantly lower than that of overall satisfaction or program recommendation. After further investigations, we found that the significant differences were likely attributed to the variations in students' self-regulated learning behaviors. Specifically, self-regulated learning was negatively associated with the difference between overall satisfaction and perceived learning ($\beta = -.427$, $p = .020$) or between program recommendation and perceived learning ($\beta = -.375$, $p = .045$).

In other words, the results suggested that students with lower self-regulated learning behaviors were more likely to provide inconsistent ratings among three outcome variables. Self-regulated learning is a key determinant in online education because online learning usually requires more self-autonomy, self-motivation, and self-regulation (Zhou & Zhang, 2023). In a

traditional classroom, students may receive more pressure from the surrounding environment, while in online learning, students usually have more freedom and flexibility in making study arrangements. Therefore, promoting self-regulated learning behaviors in online students through proper training would be beneficial. The online degree program may provide training workshops to the students enrolled before they start to take the online courses.

Implication Four: Implications to School Administrators and Accreditation Bodies

One of the critical implications of this study is to provide valuable references to school administrators or accreditation bodies. During the past decade, universities have continuously devoted their efforts to developing online programs, and online learning has become a significant portion of higher education worldwide (Seaman et al., 2018). Statistics show that distance education enrollments in universities across the United States have consistently increased over the past twenty years (Muljana & Luo, 2019). According to the National Center for Education Statistics, the percentage of undergraduate students taking at least one online course increased from 15.6% to 74%, and taking distance education courses exclusively increased from 4.9% to 45.5% from the year 2003 to the year 2020 (*Digest of education statistics*, 2021). To adapt to this trend, school administrators may use the proposed framework to evaluate their online degree programs. In addition, revisions can be made to tailor the evaluation framework to their needs. The ultimate goal is to make continuous improvements in the delivery of online degree programs based on the data collected from the students.

On the other hand, this study may also provide meaningful implications for accreditation bodies. Accreditation bodies accredit programs by setting standards worldwide to assure that a college or university program meets the quality standards of the profession for which that program prepares graduates. The results of this study may offer students' perspectives in evaluating the online degree programs and thus provide references for standard setting carried out by accreditation bodies such as the Association to Advance Collegiate Schools of Business (AACSB) and Accreditation Board for Engineering and Technology (ABET).

Limitations and Future Research

This study proposed a framework for evaluating online degree programs. Data was collected from an existing online program in higher education to assess the underlying relationships and identify the key factors. In addition, several implications were suggested based on the data analysis. Apart from the potential contributions, a few limitations associated with this study are worth mentioning. First, the sample was collected from a 4-year public university in the southern region of the United States. The key factors identified and the conclusions addressed may not apply to other online degree programs with different circumstances. Different key factors may be specified in a diverse sample. The underlying goal of this study was to provide a framework and an example for evaluating the online degree program. Secondly, the framework proposed was an initiative in the field, which consists of six big categories of factors and three dimensions regarding student satisfaction. The overall framework needs to be improved, and more elements may be added to both sides to expand on this proposed initiative.

Additionally, this study was developed to evaluate the online degree program only from the students' perspectives. Higher education is considered a part of the service industry, and students are the customers whose opinions are the key to success (Canning, 2017). However,

looking at the issue from only one angle may be limited, while seeing the problem from different perspectives (e.g., faculty or administrators) may broaden the horizons. Finally, most of the students who completed the survey were undergraduates, while the sample collected from the graduate students was tiny. As a result, we could not test the framework in evaluating the online degree program at the graduate level.

Future research may focus on various aspects to expand on this study. First, the proposed framework may be implemented in various online degree programs (e.g., business, education, or health programs) with different circumstances. Based on the various samples collected, we may better understand the key factors affecting online degree program satisfaction in other conditions. Secondly, key factors identified in this study may be used as control variables to investigate the effects of these factors in future intervention studies. Thirdly, evaluating online degree programs from different perspectives is essential. Research frameworks may be developed from faculty or school administrators' perspectives in assessing online degree programs.

Additionally, samples targeting diverse populations may be collected, and comparisons can be made across samples. For instance, future research may compare the effects of students from different cultures or educational backgrounds. Finally, more factors may be added to the six big categories, and additional dimensions under student satisfaction can be identified. It is expected to modify and expand the existing conceptual framework to improve the evaluation of online degree programs from students' perspective.

Ethical Approval

This study was approved by the Institutional Review Boards (IRB) at the University of Southern Mississippi, Mississippi, United States, and the protocol number is 22-208.

Disclosure Statement

The author reported no potential conflict of interest.

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Appendix

Survey Items

Factors	Variables	Items on survey
Program Factors	Academic advising	Please rate your satisfaction with the academic advising of the program.
	Financial aid	Please rate your satisfaction with the financial aid of the program.
	Tuition costs	Please rate your satisfaction with the tuition costs of the program.
	Program reputation	Please rate your satisfaction with the reputation of the program.
Course Factors	Course quality	Please rate your satisfaction with the overall quality of the courses offered.
	Course flexibility	Please rate your satisfaction with the time flexibility of the courses offered.
	Course variability	Please rate your satisfaction with the breadth of the courses offered (a variety of courses).
	Course availability	Please rate your satisfaction with the depth of the courses offered (the level of difficulty).
Instructor Factors	Instructor knowledge	Instructors are knowledgeable about their respective disciplines.
	Instructor availability	Instructors have been available for questions and assistance.
		Instructors have responded to my emails in a timely manner.
	Instructor attitude	Instructors have been friendly toward the students.
		Students felt welcome to seek advice or help.
Technical Factors	LMS ease of use	Overall, the learning management system (Canvas) is easy to use.
	LMS usefulness	Overall, the learning management system (Canvas) is efficient and useful in delivering online classes.
	Technical assistance	It is convenient to get technical assistance when you have issues with the learning management system (Canvas).
Student Factors	Self-regulated learning	I am a self-motivated and self-regulated learner of online classes.
	Self-efficacy	I can overcome most of the challenges and obstacles in online classes.
Career Factors	Job placement expectation	Please indicate whether you feel optimistic or pessimistic about the future job.
	Assistance in job searching	Please rate your satisfaction with the assistance in job searching during your study in the program placement opportunities after you finish the program.
	Future career development	Please indicate whether you feel optimistic or pessimistic about future career development opportunities (such as job changes or promotion opportunities) after you finish the program.
Outcome Variables	Overall satisfaction	Please rate your overall satisfaction with your experience in the program.
	Program recommendation	How likely are you to recommend the Program to others?
	Perceived learning	Please indicate your perceived learning from the degree program.
QSLQ	24-item	Barnard et al. (2009)
OLSE	8-item	Alqurashi (2019)