Information Systems (IS) Student Perspectives on Acceptable Online Courses

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ABSTRACT

It is important to know what students value in their online learning experiences and how different types of students value quality aspects differently. This study examines the significant factors in creating a high-quality online learning experience from IS students' perspective; second, investigates the importance of those factors for IS students in relation to their acceptance of online classes; and third, examines the difference between IS and non-IS students regarding their perceptions of online teaching quality. Using exploratory factor analysis and regression analysis the results suggest that all business students (IS and non-IS students) found that basic competence in online teaching, good instructional design, teacher presence during the class, intellectual stimulation, and good student-to-student interaction were important and significant. All business students rated higher-end online teaching tools such as prerecorded videos as being relatively important descriptively, but they were not empirically significant in predicting online course acceptance (although IS students thought high-end interaction using technology was more important than non-IS students). Cognitive presence was slightly more important as a predictor of online course acceptance than social presence for IS students compared to non-IS students. Implications and study limitations are discussed.

Key words: Online Education, Information Systems, Online Teaching, Online Class Acceptance.
JEL Classification: M1, M19

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1. INTRODUCTION

Students' perceptions of online learning are vitally important to study in this age of online education in order to inform better practice. Understanding students' expectations are even more relevant when new teaching approaches and new technologies are evolving (Arthur, 2009; Crews and Butterfield, 2014; Van Wart, Ni, Ready, Shayo, and Court, 2020a). Some of the ways in which students evaluate quality as reviewed in the literature include: sense of learning achievement, satisfaction with support received, technical proficiency of the process, intellectual and emotional stimulation, comfort with the process, and sense of learning community (Van Wart et al. 2020a), among others.

However, the literature has been fragmented about what factors are most important to which student groups, often dividing between education-focused and technology-focused perspectives. Another problem has been the simplicity of some models, which may provide heuristic succinctness, but fail to provide deeper analytical insights. Therefore, the field has struggled to provide comprehensive models that are empirically supported and nuanced enough to provide rigorous comparative disciplinary insights. Building on a series of previous studies, Van Wart et al. (2020b) provided a model that successfully integrated a diverse set of factors from the different schools of thought and can effectively examine more nuanced disciplinary differences where they exist.

This study uses the Van Wart et al. (2020b) model to focus on the perspectives of IS students. That is, what are the significant factors in creating a high-quality online learning experience from IS students' perspectives, what are their relative importance, and do they differ from other business students? This paper is organized as follows. A literature review provides an overview of online education quality from the student perspective as well as a theoretical basis for it. The rest of the paper is divided into the research questions, methods, results, discussion, and study limitations sections.

2. LITERATURE REVIEW

In investigating students' perceptions of quality online education, researchers have used: (1) a variety of theories (and their purposes), (2) simple versus more comprehensive factor models, and (3) a broad learner focus versus ones focusing on the differences among student groups. Here we briefly review each of these dimensions to situate our specific approach of examining student perspectives, particularly IS students, regarding online education.

2.1 Theories

Theories are designed and refined largely growing out of purpose, intended audience, etc. Here we simplify that review to two broad schools of thought about online education: *technology adoption theory* and *education-based theory*.

Technology adoption theories tend to focus on the reasons for the adoption of technology, recruitment of users or customers to a technology, and the retention of users (Panigrahi, Srivastava and Sharma, 2018; Buche et al., 2012; Al-Gahtani, 2016; Yakubu and Dasuki, 2019). The major thrust is the (potential) improvement of the technological system which includes teaching/learning utilization patterns (e.g., Huang et al., 2019a; Wingo, Ivankova, and Moss, 2017), but also other factors such as reputation, ease of use, and faculty support (Islam, Beer and Slack, 2015; Mohammadi, 2015). In the online education context, this approach tends to be most useful to programs and institutions seeking out the most impactful practices to promote (e.g., Freeman and Urbaczewski, 2019), and to those with a special interest in the robust use of technology for non-teaching reasons such as increased flexibility, access, cost reduction, market reach and so on

(Martins et al., 2019; Tove, Kåre, and Boge, 2020; Bin and Cheng, 2021).

Education-based theories related to online teaching/learning tend to focus on how educational outcomes are maximized, only a portion of which is directly related to technologies themselves (Paechter and Maier, 2010; Jung, 2011). The factors identified tend to be recognizable to those interested in education such as cognitive stimulation (Durabi et al., 2011), motivation (Fidalgo et al., 2020), facilitation (Cacciamani et al., 2012), online quizzes (Cook and Babon, 2017), or engagement (Chen, Lambert, and Guidry, 2010; Huang et al., 2019b; Farrell and Bruton, 2020). They tend to be more focused on the teaching methods, strategies, and assessment used by faculty, training programs for faculty, and those interested in disciplinary education (e.g., Espana and Meneses, 2010; Crews and Butterfield, 2014; Jaggars and Xu, 2016; Takamine, 2017).

Two prominent technology adoption modes are the unified theory of acceptance and use of technology or UTAUT (Venkatesh et al., 2003; Sangeeta, and Tandon, U. (2020), and the IS success model (DeLone and McLean, 2003; Petter and McLean, 2009; Díaz et al., 2010; Kay, MacDonald, and DiGiuseppe, 2019). The independent variables proposed by the UTAUT model include social influence, performance expectancy, effort expectancy, and facilitating conditions. The IS success model proposes only three independent variables: information quality, system quality, and service quality. Note that the bulk of the instructor-focused concerns related to design and implementation of courses loads in the performance expectancy factor in the Venkatesh et al. model, and in the content factor in the DeLone and McLean model.

Two examples of education-based approaches are the Community of Inquiry or CoI (Garrison, Archer and Archer, 2000; Arbaugh et al., 2008; Kozan and Caskurlu, 2018) and the expanded teaching principles model (Van Wart et al. 2020b). In contrast to technology adoption models, the education-based factors in this approach are descriptively familiar to the education literature. The CoI model uses teaching presence, cognitive presence, and social presence which has been theoretically used to promote cognitive and social presence (e.g., le Roux and Nagel, 2018; Martin, Wang, and Sadaf, 2018), but empirically whose variance is largely captured by the single factor, teaching presence (Arbaugh et al., 2008). Because the CoI was not designed to investigate the online environment per se, none of its factors specifically test for that dimension without adaptation. The expanded online teaching principles model uses teaching presence, cognitive presence, and social presence, but adds instructional support to teaching presence, and adds three categories that are reflective of the online environment itself: basic online functionality, advanced online functionality, and online social comfort. These factors were derived from exploratory factor analysis and confirmed as significant through regression analysis (Van Wart et al., 2020b). The major innovation of the model is that it utilizes a degree of quality by factor with various adoption thresholds, thereby integrating the education and technology perspectives.

The independent variables for the technology adoption models include—intention to use, actual usage, voluntariness, and benefits. In contrast, the independent variables of the education models are based on student perceptions of importance, learning achievement, and satisfaction. (See Table 1 for a comparison of technology adoption and education-based approaches.)

All in all, studies focusing on students' perceptions of quality online education fall under two schools of thought: technology adoption theory and education-based theory. The first focuses on the reason for the adoption of technology, and the latter on how educational outcomes are maximized. Two examples of education-based approaches are the Community of Inquiry (CoI) and the expanded teaching principles model. CoI was not designed to investigate the online environment per se without adaption. Meanwhile, the expanded online teaching principles model adapted the simplistic CoI factors (teaching presence, social presence, and cognitive presence) by adding

factors reflective of the online environment such as basic online functionality, advanced online functionality, and instructional support. Therefore, because of our focus on applied teaching strategies, we utilize an education-based theory with well-articulated quality factors but which has a dependent variable incorporating acceptance as a combination of enjoyment, comfort, learning performance, and integrity (as discussed later and identified in Table 6).

Table 1. Technology Adoption Versus Education-Based Approaches to Online Education (presented as Weberian ideal types)

	Primary purposes	Most common audience	Articulation of quality teaching	Examples of independent variables considered	Examples of moderating and dependent variables considered
Technology adoption approaches	--improvement in adoption, recruitment, and retention systems --improvement of technological system of which the education component is a portion	--programs --institutions --those focused on technology	--embedded in a model that also includes quality of reputation, ease of use, support systems of faculty --education factors tend to focus on broad characteristics rather than traditional education concepts	--*Venkatesh* social influence, performance expectancy, effort expectancy, and facilitating conditions. --*DeLone and McLean* information quality, system quality, service quality	*Venkatesh* --intention to use --actual usage --voluntariness *DeLone and McLean* --intention to use/ actual usage --user satisfaction --net benefits
Education-based approaches	--improvement in online teaching quality --improvement of the online educational system of which technology is a part	--faculty --faculty training and programs --those focused on education	--embedded in the fields of teaching, learning of which online education is a part --factors identified tend to recognizable to those interested in disciplinary education	--*Community of Inquiry* teaching presence, cognitive presence, social presence --*Van Wart et al. 2020b* teaching presence, cognitive presence, social presence, instructional support, basic online modality, interactive online modality	*Community of Inquiry* --importance of factors (a combination of learning achievement and satisfaction) *Van Wart et al 2020b.* --minimum for enrollment --acceptance by average student --expectations by choosiest students

2.2 Simplicity versus Complexity in Analyses

The parsimony principle in modeling is to strive for the fewest logical factors to explain or predict with the most accuracy. Importantly, however, it dictates the fewest, not necessarily just a few, factors depending on purpose and complexity. Simple models with fewer parameters tend to be easier to understand and explain, and are therefore excellent for heuristic purposes. They can be applied to a wide range of new datasets, but must be adapted to do so (King and He, 2006). Some phenomena that are investigated are more complex, or investigated with a broader

perspective, necessitating more factors (e.g., Asoodoar et al., 2016). For example, a study examining the explanation of variance derived from the Quality Matters matrix was approximately 80% when considering the top eight factors (Sadaf, Martin, and Ahlgrim-Delzell, 2019). The UTAUT, IS success, and CoI are designed to be relatively simple, and yet powerful, models of overarching factors. However, simple models are weaker at explaining differing sets of conditions or environments.

On the other hand, more complex models can tease out significant temporal, subgroup, or process distinctions and provide useful applied insights. For example, some researchers, while noting the parsimony of the CoI framework in some contexts, also note the need for more refinement (Shea et al., 2012; Anderson, 2016; Kozan and Caskurlu 2018). Some researchers develop conglomerate frameworks by bringing together eclectic factors from multiple domains related to teaching, learning, adoption, personality, etc. to form conglomerate frameworks (Asoodoar et al., 2016; Baragash and Al-Samarraie et al., 2018). The Van Wart et al. 2020b model focuses on student perceptions only, incorporates CoI factors, and is somewhat more complex by adding four additional factors, enabling a more detailed perspective on teaching. Because of our interest in a refined understanding of the online teaching process, we use the Van Wart et al. 2020b survey instrument although it should be noted that we have somewhat adjusted the language used for the factors they found. The factors are teaching presence, cognitive presence, social presence, instructional support, basic online functionality, and advanced online functionality. Teaching Presence refers to students' perceptions on the quality of communication in lectures, directions, and individual feedback including encouragement (Jaggars & Xu, 2016; Marks et al., 2005). Online instructors provide clear instructions on how to participate in course learning activities, clearly communicate important course goals, clearly communicate important due dates/time frames for learning activities, help to focus discussion on relevant issues, help keep students on task in a way that helps them learn efficiently, provide feedback that helps students understand their strengths and weaknesses relative to the course's goals and objectives, encourage students to explore new concepts, and provide feedback in a timely fashion (Abdulla, 2004; Baillie, 2006, 2011; Smith, 2005; Varvel, 2007; Marks et al., 2005). Cognitive Presence relates to how instructors encourage students to explore new concepts, and how they organize learning activities to help students explore problem-solving opportunities. Cognitive Presence refers to how students perceive they are stimulated by the material and instructor to reflect deeply and critically and understand different perspectives (Garrison, Anderson, and Archer 2003). Social Presence refers to students' perceptions on the quality of student-to-student interaction, specifically on providing an environment where students can collaborate and express their opinions safely (le Roux and Nagel, 2018; Martin, Wang, and Sadaf, 2018; Garrison et al., 2003). Instructional Support refers to students' perceptions on the techniques used by the instructors for rehearsal, feedback, and communication. It has been consistently supported as an element of student perceptions of quality (Espasa & Meneses, 2010). Basic Online Functionality refers to the instructor's competence on the use of basic online tools such as the announcement function, online grade book, online grading, and allowing students to make online submissions (Van Wart et al., 2020b). Advanced Online Functionality refers to the "high-end" usage of online functionality including video conferencing platforms, chatrooms, video lectures, and small group discussions.

2.3 Focus on All Students or IS Students

High-level disciplinary similarities are very common in online education research. The purpose is to focus on overarching principles, essentially controlling for age, gender, discipline,

etc. to achieve as much generalizability as possible across a wide range of learners.

However, other studies purposely investigate the more subtle, or sometimes not-so-subtle, differences among different groups of learners by age, gender, economic status, level of study, personality, etc. (Artino, 2010; Xu and Jaggars, 2014; Koper, 2015; Ventura and Moscoloni, 2015; Dang et al. 2016; Eastman, Aviles and Hanna, 2017; Clayton, Blumberg, and Anthony, 2018; Wang et al., 2019). Prior research has suggested that, given the different motivations and learning styles of higher education learners, students may value success factors differently (Tiwana & Ramesh, 2001; Fogel & Nehmad, 2009). King and He (2006) also reported that user context (student users vs. non-student users) has a key moderating influence on various issues that govern system adoption and recommended that one cannot generalize findings specific to student users to non-student users.

In some cases, the field of study focuses on a narrower range of learners' opinions based on discipline. According to Smith et al. (2008) "discipline is often overlooked in research on the instructional design of e-learning." Arbaugh (2009) argued that students' preferences for online education should not be assumed similar across disciplines, and specifically pointed out that the quality of online education and student's satisfaction needed to be examined within their respective discipline. Recently, researchers have started to look into academic discipline as a differential factor such as public administration (Ni, et. al. 2021), or management (Zhang, et. al. 2020). In the case of IS, Schwieger & Ladwig (2021) in their study on the use of social media tools on the Management Information Systems (MIS) curriculum found that MIS students have a tendency to learn on their own, therefore, the authors suggest using tools such as video lectures. Wan et al. (2007) stated that IS scholars have not studied student characteristics and learning outcomes sufficiently. In line with this concern, we wish to explore not only what their learning profile is, but also if and how it contrasts with other types of business students. While there are numerous studies that use IS students' perceptions as a means of studying their preferences, none do so with a comprehensive educational focus that has been rigorously supported analytically.

3. RESEARCH QUESTIONS

There are three research questions that have to do with the factors of quality, their relative importance, and differences between IS students and non-IS students.

The first research question is: *What are the significant factors in creating a high-quality online learning experience from IS students' perspectives?* This question looks for the identification of the set of factors that encompass the full range of students' expectations.

The second research question is: *What is the relative importance of those factors for IS students related to their acceptance of online classes?* The purpose of this question is to provide a sense of the importance that IS students perceive in terms of acceptance of online classes.

The last question is: *Is there a difference between IS and non-IS students and their perceptions of online teaching quality related to their acceptance of online classes?* For this study, the comparison is only between IS and other business students, so we would not expect major differences. However, some differences seem likely, and it would be useful to know what those differences are.

4. METHODS

4.1 Research Methods

We use the Van Wart et al. 2020b survey instrument measuring students' perceptions about the importance of various techniques and indicators leading to high-quality online classes.

Additionally, demographic information (age, year in the program, distance from the University, number of online classes taken, high school experience with online classes, and communication preferences) was collected to evaluate their effects on students' level of acceptance of online classes.

4.2 Sample

Subjects are from a public Western U.S. University enrolled in information systems (IS), management, accounting and finance, marketing, and public administration courses within a School of Business and Public Administration. The Western U.S. University enrollment is considered representative of other institutions enrollment in IS programs. All participants completed a survey via Qualtrics. The data collection was in the spring of 2019. The total (usable) population analyzed was 1,298: 144 IS students, and 1,154 non-IS students.

Data from the National Center for Education Statistics (2018) shows that the percentage of undergraduate students in the business/management field of study showed a steady increase from 2003 (18.7%) to 2016 (51.3%). From institutional data, at the same time frame, the data for this study was collected, the number of students enrolled in online courses by department ordered from lowest to highest was public administration (214), marketing (473), accounting and finance (493), management (514), and information systems (940). These values show that the number of IS students enrolled in online courses is almost double that of the second highest department. This tendency continues in the Spring 22 semester with public administration (880), marketing (911), accounting and finance (1455), management (1841), and information systems (2605).

Most of the students were young, 80% being under 28 years (82.0% IS, and 80.6% Non-IS). In addition, 75% of the sample were taking upper-division (junior and senior level) courses (97.2 IS, and 75.6% Non-IS). IS and non-IS students were similar in the number of hybrid or online courses taken in high school. In terms of the number of hybrid or online courses taken at the university level, 48.6% of the IS students but only 29.8% of non-IS students had taken more than four online courses at the University (a difference of 18.8%). Eighty-nine percent of the IS students and 64.22% of the non-IS student population live no more than 25 miles away from campus (a difference of 25.28%). Seventy percent of the IS students were working (39.6% part-time and 30.6% full-time), while seventy-four percent of the non-IS population were working (43.7% part-time and 31.2% full-time). Ninety-seven percent of IS students were at the junior level, while only seventy-five of the non-IS students were at the same level. For more details, see Table 2.

Table 2. Demographic Information of the Participants (n = 144 IS Students; n = 1,154 – Non-IS Students)

	IS Students		Non-IS Students			IS Students		Non-IS Students	
	Freq.	Valid %*	Freq.	Valid %*		Freq.	Valid %*	Freq.	Valid %*
Age					# of HD/OL classes taken at the University				
17-22	59	41.0	574	49.7	0	4	2.8	26	2.3
23-28	59	41.0	357	30.9	1-2	35	24.3	464	40.2
29-34	12	8.3	111	9.6	3-4	35	24.3	320	27.7
35-40	5	3.5	45	3.9	5-6	39	27.1	184	15.9
41 or older	9	6.3	67	5.8	7 and above	31	21.5	160	13.9

Year in Program					Working Status				
Freshman	0	0	26	2.3	Not working	43	29.9	290	25.1
Sophomore	4	2.8	45	3.9	Part-Time	57	39.6	504	43.7
Junior	39	27.1	406	35.2	Full-time	44	30.6	360	31.2
Senior	101	70.1	466	40.4					
Other	0	0	211	18.3	Race				
					White	33	22.9	197	17.1
Had HD/OL classes in high school					African American	3	2.1	60	5.2
Yes	29	20.1	248	21.5	Asian Pacific Islander	19	13.2	127	11.0
No	115	79.9	906	78.5	Latino	71	49.3	688	59.6
					Other	18	12.5	82	7.1
Distance to University									
Less than 1 mile	9	6.3	75	6.5					
1 to 5 miles	22	15.4	175	15.15					
6 to 10 miles	15	10.5	69	5.97					
11 to 25 miles	82	57.34	422	36.56					
More than 25 miles	15	10.5	413	35.78					

*Percentage eliminating missing values; HD = Hybrid; OL = Online

Among the reasons for IS students to take online/hybrid courses, 94.5% rated convenience as a major reason for taking online/hybrid class while it was 84.2% for the non-IS students, representing a difference of 10.3%. Convenience is based on distance and flexibility. Results from the regression analysis (See Table 7) show that Distance to University was not significant for IS students. Therefore, IS students value flexibility more than average non-IS students.

Table 3. Reasons for Taking Online/Hybrid Classes (n = 144 IS Students; n = 1,154 – Non-IS Students)

	IS Students		Non-IS Students	
Reasons	Count	Percent of Respondents	Count	Percent of Respondents
It is convenient (e.g., distance, flexibility)	113	94.5	973	84.2
I like the style of teaching done	27	18.8	256	22.1
It helps with challenges in face-to-face scheduling	42	29.2	350	30.2
Other	28	19.5	160	13.8
Total	200*	133.6*	1,739*	150.12*

*Multiple responses allowed

4.3 Measures and Procedures

Using SPSS 27.0, a principal component method with Varimax rotation was applied to explore the factor constructs from the students' perspective. Only factors with Eigen values greater than one, and item correlations of student perceptions of importance coefficients greater than .40 were included.

5. RESULTS

5.1 Exploratory Factor Constructs

IS student population. Twenty-nine items loaded on six coherent factors. All factors were logically consistent. The first factor, with eight items we labeled Teaching Presence and includes items such as providing clear instructions, helping students to keep on track, clear deadlines, and customized feedback on strengths and weaknesses. All items under Teaching Presence are related to the instructor's participation as director, monitor, and learning facilitator. The second factor is labeled Cognitive Presence, with six items. It includes providing opportunities for reflection, stimulating curiosity, and the applicability of the material. The third factor with five items is labeled Social Presence. Items included developing a sense of collaboration, forming impressions of other students, and interacting with other students. The fourth factor is labeled Instructional Support and has four items. It includes providing sufficient rehearsal, techniques for communication, instructor providing feedback, and having enthusiasm. The fifth factor is labeled Basic Online Functionality with three items. It included allowing students to make online submissions, use of online gradebook, and online grading. The sixth factor is labeled Advanced Online Functionality with three items, which include use of videoconferencing, pre-recorded instructor video lectures, and small group discussions. The six factors explained 71% of the variance which is considered very good for this type of study (Hair, Black, Babin and Anderson, 2014). See Table 4a for full details.

Table 4a. Factors Loadings for IS Students' Online Learning Priorities*

Survey Items	Factor 1 Teaching Presence	Factor 2 Cognitive Presence	Factor 3 Social Presence	Factor 4 Instructional Support	Factor 5 Basic Online Functionality	Factor 6 Advanced Online Functionality
Online instructors provide clear instructions on how to participate in course learning activities.	.816					
Online instructors clearly communicate important due dates/time frames for learning activities.	.771					
Online instructors clearly communicate important course goals.	.705					
Online instructors help to focus discussion on relevant issues.	.679					
Online instructors help keep students on task in a way that helps them learn efficiently.	.652					
Online instructors provide	.645					

feedback that helps students understand their strengths and weaknesses relative to the course's goals and objectives.					
Online instructors encourage students to explore new concepts.	.632				
Online instructors provide feedback in a timely fashion.	.603				
Online courses provide opportunities for meaningful reflection on course content.		.772			
Online learning activities help me construct explanations/solutions.		.716			
Online discussions are valuable in helping me appreciate different perspectives.		.602			
I can apply the knowledge created in online courses to my work or other non-class related activities.	.403	.596			
Online courses have activities that stimulate my curiosity.		.580			
I can utilize a variety of information sources to explore problems posed in online courses.		.532			
I feel comfortable participating in online course discussions.			.830		
I feel comfortable disagreeing with other classmates in online courses while still maintaining a sense of trust.			.683		
Online or web-based communication is an excellent medium for social interaction.			.556		
Online discussions help me develop a sense of collaboration.		.452	.545		.418
I am able to form distinct impressions of some classmates in online courses.			.500		
Instructor having enthusiasm.				.723	
Sufficient rehearsal of material, skills to be learned, etc.				.684	
Instructor providing feedback.				.673	
The use of a variety of				.657	

techniques to communicate and learn.			
Allowing students to make online submissions.	.688		
Online grading of assignments by instructors.	.673		
Online grade book.	.672		
Zoom or other video-conference methods.		.688	
Small group discussions (chat rooms).		.646	
Video lectures.		.594	

*Six factors explain 71% of the variance. Decimal places and loadings less than .40 omitted

Non-IS student population. Twenty-nine items loaded identically on the six factors discussed above with IS students. The six factors explained 70% of the variance, which is considered very good (Hair, Black, Babin and Anderson, 2014). See Table 4b for full details.

Table 4b. Factors Loadings for Non-IS Students' Online Learning Priorities*

Survey Items	Factor 1 Teaching Presence	Factor 3 Social Presence	Factor 2 Cognitive Presence	Factor 4 Instructional Support	Factor 5 Basic Online Functionality	Factor 6 Advanced Online Functionality
Online instructors provide clear instructions on how to participate in course learning activities.	.792					
Online instructors clearly communicate important due dates/time frames for learning activities.	.762					
Online instructors provide feedback in a timely fashion.	.729					
Online instructors help keep students on task in a way that helps them learn efficiently.	.724					
Online instructors clearly communicate important course goals.	.718					
Online instructors provide feedback that helps students understand their strengths and weaknesses relative to the course's	.714					

goals and objectives.				
Online instructors encourage students to explore new concepts.	.645			
Online instructors help to focus discussion on relevant issues.	.644			
Online discussions help me develop a sense of collaboration.		.776		
I feel comfortable participating in online course discussions.		.755		
I feel comfortable disagreeing with other classmates in online courses while still maintaining a sense of trust.		.709		
Online or web-based communication is an excellent medium for social interaction.		.619		
I am able to form distinct impressions of some classmates in online courses.		.543		
Online courses provide opportunities for meaningful reflection on course content.			.720	
Online learning activities help me construct explanations/solutions.			.679	
I can apply the knowledge created in online courses to my work or other non-class related activities.			.626	
Online courses have activities that stimulate my curiosity.			.595	
I can utilize a variety of information sources to explore problems posed in online courses.			.570	
Online discussions are valuable in helping me appreciate different perspectives.		.466	.526	

Sufficient rehearsal of material, skills to be learned, etc.	.797		
Instructor having enthusiasm.	.684		
Instructor providing feedback.	.665		
The use of a variety of techniques to communicate and learn.	.565		
Allowing students to make online submissions.		.817	
Online grade book.		.705	
Online grading of assignments by instructors.		.690	
Zoom or other video-conference methods.			.844
Video lectures.			.649
Small group discussions (chat rooms).			.579

*Six factors explain 70% of the variance. Decimal places and loadings less than .40 omitted.

Cronbach alpha was calculated to measure factor reliability. All values were greater than .70, the standard threshold used for reliability.

As an additional indicator of students' sense of factor importance, all items were means averaged. Factor means (lower scores in this case meaning more important to the student) ranged from 1.317 to 2.486 on a 5-point scale for IS students and from 1.415 to 2.477 on a 5-point scale for non-IS students. For IS and non-IS students the three most important factors are Basic Online Functionality, Instructional Support, and Teaching Presence. For IS students the last three most important factors are Cognitive Presence, Advanced Online Functionality, and Social Presence. For the non-IS students, Social Presence, Cognitive Presence, and Advanced Online Functionality were the last three factors. Strictly based on lower means for four of the six factors, IS students can be interpreted as more demanding than non-IS students (note that one factor was identically weighted for both). The exception, however, is Social Presence in which IS students are less interested than non-IS students. See Table 5 for details.

Table 5. Factor Importance to IS and Non-IS Students by Means and Factor Loading

	IS Students				Non-IS Students			
Factors	**Mean**	**Std dev**	**Loading rank**	**Cronbach α**	**Mean**	**Std dev**	**Loading rank**	**Cronbach α**
Basic Online Functionality	1.317	.529	5	.771	1.415	.604	5	.843
Instructional Support	1.678	.665	4	.816	1.754	.735	4	.844
Teaching Presence	1.849	.739	1	.918	1.860	.764	1	.924

Cognitive Presence	2.139	.841	2	.905	2.139	.812	3	.905
Advanced Online Functionality	2.194	.996	6	.738	2.306	.985	6	.792
Social Presence	2.486	.974	3	.851	2.477	.906	2	.864

* Ranking is based on the average mean of students' ranking importance of survey items: 1=Very High, 2=High, 3=Neutral, 4: Somewhat Low, and 5=Very Low; Lower averages indicate greater importance

In addition to factors that examined aspects of teaching performance, a variable capturing overall student comfort with online learning was constructed with six items, including "I enjoy online learning," "My overall impression of hybrid/online learning is very good," and "The instructors of online/hybrid classes are generally responsive." This factor, labelled Online Class Acceptance, measures the degree to which students not only enrolled in online classes out of necessity, but also perceived positive attributes of online instruction. Online Class Acceptance is logically consistent with a Cronbach's α greater than 0.80 (0.84 for the IS students, and 0.81 for the non-IS students).

5.2 Regression Results

Online Class Acceptance was the dependent variable. The six quality-of-teaching factors from the factor analysis, in addition to control variables (age, ethnicity, work-status, distance to University, and number of online/hybrid class taken in the past) were considered as independent variables.

IS student population. The analysis indicates that for IS students Social Presence, Basic Online Functionality, Cognitive Presence, and Instructional Support are significant in accepting online classes. IS students who rated Instructional Support higher are less accepting of online classes. See Tables 6 and 7 for details.

Table 6. Description of Variables – IS Students

Dependent Variable	**Description**
Online Acceptance	Scale 1 (strongly agree) to 5 (strongly disagree) rating of 6 items (Cronbach's α = .841) I enjoy online learning. My overall impression of hybrid/online learning is very good. I often speak or communicate to others in online classes. The instructors of online/hybrid classes are generally responsive. Instructors reduce and catch cheating effectively in hybrid/online classes. I am comfortable with online learning technologies.
Independent Variables	
Age	Student's age
Race	White (1), African American (2), API (3), Latino (4), and Other (5)
Work Status	Full Time (2), Part Time (1), Not Work (0)
Distance to University	Number of miles away from campus
Number of HD/OL Classes Taken	Number of classes taken
Teaching Presence	Factor score

Social Presence	Factor score
Instructional Support	Factor score
Advanced Online Functionality	Factor score
Cognitive Presence	Factor score
Basic Online Functionality	Factor score

Table 7. Summary of Multiple Regression Analysis: Online Class Acceptance of IS Students

Analysis of Variance	**Online Class Acceptance**				
Source	**DF**	**Sum of Squares**	**Mean square**	**F Ratio**	**Sig.**
Model	15	65.047	4.336	14.401	.000
Error	127	38.242	.301		
C. Total	142	103.288			

Parameter Estimates				
Term	**Estimate**	**Std Error**	**t Ratio**	**Sig.**
Intercept	1.168	.284	4.109	.000***
Age	-.071	.049	-1.439	.152
African American (vs. White)	.286	.344	.832	.407
Asian Pacific Islander (vs. White)	-.642	.170	-3.775	.000***
Latino (vs. White)	-.259	.140	-1.857	.066*
Other (vs. White)	-.336	.174	-1.936	.055*
Nonworking (vs. Full-time working)	.083	.130	.637	.525
Nonworking (vs. Part-time working)	.043	.117	.365	.716
Distance to University	-.001	.003	-.282	.778
Number of HD/OL Classes Taken	-.024	.017	-1.466	.145
Teaching Presence	.153	.093	1.636	.104[+]
Social Presence	.370	.073	5.047	.000***
Instructional Support	-.365	.087	-4.192	.000***
Advanced Online Functionality	.045	.061	.741	.460
Cognitive Presence	.209	.088	2.362	.020**
Basic Online Functionality	.302	.109	2.777	.006**

Note. $R^2 = .630$

*p<.10, **p<.05, ***p<.01.

[+] Technically not significant but interpreted here as significant.

Non-IS student population. Significant factors for accepting online classes for non-IS students were Teaching Presence, Cognitive Presence, Social Presence, Basic Online Functionality, and Advanced Online Functionality. Also, older students were found to be more accepting of online classes. Nevertheless, the farther they live from campus, the higher they rated Instructional Support and the higher the number of online/hybrid courses that they have taken at the University but the less accepting of online classes they are. See Tables 8, and 9 for details.

Table 8. Description of Variables – Non-IS Students

Dependent Variable	**Description**

Online Acceptance	Scale 1 (strongly agree) to 5 (strongly disagree) rating of 5 items (Cronbach's α = .811) I enjoy online learning. My overall impression of hybrid/online learning is very good. I often speak or communicate to others in online classes. The instructors of online/hybrid classes are generally responsive. I am comfortable with online learning technologies.
Independent Variables	
Undergraduate/Graduate	Undergraduate (1), Graduate (0)
Age	Student's age
Race	White (1), African American (2), API (3), Latino (4), and Other (5)
Work Status	Full Time (2), Part Time (1), Not Work (0)
Distance to University	Number of miles away from campus
Number of HD/OL Classes Taken	Number of classes taken
Teaching Presence	Factor score
Social Presence	Factor score
Instructional Support	Factor score
Advanced Online Functionality	Factor score
Cognitive Presence	Factor score
Basic Online Functionality	Factor score

Table 9. Summary of Multiple Regression Analysis: Online Class Acceptance of Non-IS Students

Analysis of Variance	**Online Class Acceptance**				
Source	**DF**	**Sum of Squares**	**Mean square**	**F Ratio**	**Sig.**
Model	16	346.608	21.663	95.858	.000
Error	1134	256.272	.226		
C. Total	1150	602.880			

Parameter Estimates				
Term	**Estimate**	**Std Error**	**t Ratio**	**Sig.**
Intercept	1.220	.101	12.092	.000***
Undergraduate vs Graduate	.010	.043	.233	.815
Age	.034	.016	2.186	.029**
African American (vs. White)	.084	.070	1.193	.233
Asian Pacific Islander (vs. White)	.016	.058	.284	.777
Latino (vs. White)	.039	.041	.965	.335
Other (vs. White)	.042	.065	.649	.516
Nonworking (vs. Full-time working)	.035	.042	.831	.406
Nonworking (vs. Part-time working)	.008	.038	.217	.829
Distance to University	-.029	.005	-6.062	.000***
Number of HD/OL Classes Taken	-.006	.001	-11.189	.000***
Teaching Presence	.229	.025	9.036	.000***
Social Presence	.179	.022	8.292	.000***

Instructional Support	-.064	.024	-2.641	.008**
Advanced Online Functionality	.013	.017	.767	.443
Cognitive Presence	.195	.027	7.118	.000***
Basic Online Functionality	.083	.028	3.018	.003**

Note. $R^2 = .575$
*p<.10, **p<.05, ***p<.01.

From the regression analysis, both groups consider (lack of) Instructional Support as a factor that negatively affects their acceptance of online classes. Teaching Presence was significant for the Non-IS students but was technically just outside of the p<.10 range for IS students (p = .104). Also, Teaching Presence, Social Presence, Instructional Support, Cognitive Presence, and Basic Online Functionality are significant in terms of acceptance of online classes. For both groups, Advanced Online Functionality was not significant.

6. DISCUSSION

To return to our research questions, the study investigates what factors are individually important, how they rank in terms of criticality for a good overall experience, and how IS and non-IS students differ.

Overall, IS students are similar to non-IS students (from a pool largely composed of other business disciplines) as expected. Exploratory factor analysis identified six factors as reliable and coherent. The factors identified by IS students were: Teaching Presence, Cognitive Presence, Social Presence, Instructional Support, Basic Online Functionality, and Advanced Online Functionality. However, Advanced Online Functionality was not significant. The order of the loading was not identical for IS and non-IS students as is discussed later in this section.

Interestingly, in absolute terms (based on descriptive statistics), all students had a substantially different order which was relatively consistent between IS and non-IS students. Basic online teaching functionality was by far the most important. If an instructor cannot perform basic functions, they are not really competent in the fundamental aspects of online teaching. This is so fundamental to teaching online, however, that basic online functionality is largely assumed by students and therefore loads last among the significant factors.

Instructional support, as operationalized as instructor enthusiasm, feedback on assignments, and providing good rehearsal opportunities, was second in terms of importance, but only loaded fifth in terms of providing an overall acceptable class. Instructor support divides good classes from excellent classes, but it is not a top factor for defining an overall acceptable course.

The third most important factor for students in absolute terms was teaching presence as operationalized by communications during the class, keeping students on task, and ad hoc feedback on questions. In terms of criticality to an overall acceptable course, this was the top factor. That is, the ongoing interactions of the faculty member with the students to ensure that they are progressing smoothly as a group and individually was the single most important factor in determining an overall acceptable class.

The fourth most important in absolute terms was cognitive presence as reflection, application, and stimulation. It is significantly less important than functional competence, good design, and good presence during instruction. However, in terms of distinguishing an overall good from excellent class, it is second in factor loadings. Students expect an acceptable class to be engaging and useful.

Advanced online functionality—small group discussions, videoconferencing, and

prerecorded lectures—are fifth in absolute terms. Students clearly recognize and value instructors' efforts to provide high quality virtual interactive tools, However, advanced online use of technology does not determine course acceptability. Advanced technology tools do not discriminate between good and excellent classes. An instructor who uses advanced technology particularly well will likely have a bump in evaluations, but an instructor who does not is not necessarily going to get a poorer evaluation.

The final element in absolute terms, significantly below the other factors, is social presence. It is not particularly important to students on an individual basis because it is a by-product of the learning process, not the core purpose. However, the environment that is created by good social presence is a powerful factor in determining an overall acceptable class.

Overall, then, students evaluate the most important factors for themselves as being most closely tied to the operational teaching function related to technology, design, and feedback. Good courses are distinguished by more engagement, stimulation, and the successful creation of a learning community.

While the similarities are extensive, the differences are significant, even among the business disciplines (Albert et al., 2021), First, it was noted that IS students sign up for online classes in greater numbers. As institutional data shows, IS the field of study with the highest number of students enrolled in online courses. This is not generalizable from the sample, but it is reasonable to hypothesize that IS students feel more comfortable and confident in online courses, given the professional orientation, than the average student. Second, the lower averages in basic online functionality, instructional support, and advanced online indicate that IS students are more demanding regarding good functionality, good design, and, most notably, better use of sophisticated technology applications. IS students expect, not surprisingly, a "slicker" class. Third, IS students perceive cognitive presence as a more important determinant of overall course acceptability than does the "average" student. In turn, IS students are less concerned about social presence than the average student. The last two differences are aligned with Schwieger & Ladwig (2021) results where IS students have a propensity to learn on their own. The researchers suggest using tools such as video lectures, open textbook library material, and frequently asked questions (FAQ) forums, giving the IS students the opportunity to learn at their pace.

7. STUDY LIMITATIONS

This study has several limitations. First, the sample is from a single college (Business and Public Administration) and University. Second, some survey statements may have led students to rate quality based on experience instead of assessing the general importance of online course elements. For instance, "I feel comfortable participating in online course discussions" could be revised to "comfort in participating in course discussions."

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