Factors Mediating the Link Between Engagement and Satisfaction Among Online English-Mediated Instruction Learners During COVID-19

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Abstract: The COVID-19 pandemic forced universities worldwide to make the switch to online instruction, raising concerns about the quality of online courses and their impact on student satisfaction and engagement. This study aimed to explore Korean university students' satisfaction levels with online English-mediated instruction (EMI) courses during the pandemic and identify factors that influence class satisfaction. The purpose of this study was to provide insights into how EMI instructors could improve their online teaching practices during and after a pandemic. The hypothesis was that instructional strategies (IS), academic conscientiousness (AC), and academic integration (AI) could mediate the link between engagement and satisfaction. The study used a survey design to collect data from 219 Korean university students who took online EMI courses during the spring 2020 semester. The survey collected demographic information as well as students' perceptions of valuable IS, AC, AI, and satisfaction. Data analysis included independent samples t-test, correlation analysis, Structural Equation Modelling (SEM), and multiple regression analysis. The results showed IS use and satisfaction differed among disciplines. Specifically, there were significant differences in satisfaction levels between Arts, STEM, Business, Social Sciences, and Literature and Languages majors. Additionally, there were significant relationships between demographics, AC, AI, IS use, and satisfaction. SEM was used to provide a general view of factors mediating the link between engagement and satisfaction. The results revealed that AC, AI, and IS use mediated the link between engagement and satisfaction. Multiple regression analysis showed that students were more satisfied with instructors who demonstrated care and warmth using social networking sites to communicate. Overall, this study provides valuable insights into student satisfaction with online EMI courses during the COVID-19 pandemic and for the future of online EMI teaching-learning. The findings suggest that online EMI instructors should consider using social networking sites to communicate with students in order to increase satisfaction levels. Additionally, instructors should be aware that different disciplines may require different instructional strategies to maximize student engagement and satisfaction.

Keywords: English-mediated instruction (EMI), Engagement, Instructional strategy, Online learning, Satisfaction

1.   Introduction

When students study online, they improve attention to detail, time management, and critical thinking skills, as well as develop writing skills, and improve oral communication ability (Clinefelter, Aslanian, & Magda, 2019). Moreover, online students have a willingness to continue to enroll in and recommend online learning to others (Borstorff & Lowe, 2007). However, Means and Neisler (2021, p. 23) reported a "sharply lower student satisfaction with their courses after they shifted to remote instruction in response to the COVID-19 pandemic (from 51% to 19% of students 'very satisfied')".

Online learning was termed Emergency Remote Learning (ERT) and refers to remote teaching and learning that would normally be face-to-face or blended (Hodges et al., 2020). Once an option for students, online learning suddenly became an obligation (Bozkurt & Sharma, 2020). Basilaia and Kvavadze (2020) argued that countries with the capacity could successfully transition from traditional to online education. However, students at universities in the UK and the US in 2020 demanded tuition refunds, claiming their studies had been disrupted and they were not receiving the educational experience paid for (Belkin, 2020; Weale, Hall, & Adams, 2020). Korean university students also demanded tuition refunds, even though for six years prior to 2020, the nation ranked first on the Bloomberg Innovation Index as the most innovative technological power in the world. Claiming paid tuition did not equate to the level of education received from learning from online classes, 22 national and private student councils from various Korean universities demanded tuition refunds (Lee, 2020). Students cited dissatisfaction with lecture quality, lack of communication with instructors, and the lack of practical classes (Chung, 2020). In other words, Korea, a nation known for its ICT adoption and regular use of the Internet, had 99.2% of participants in a poll of over 20,000 university and college students demanding a tuition refund citing poor quality of online lectures (Yoo, 2020).

In English-mediated instruction (EMI), instructors use English to teach the academic subject-matter. EMI is not the same as language classes nor first language (L1) English classes. Both the setting and the students' roles are different. The primary goal is for students to achieve their course objectives in English (Dearden & Macaro, 2016). The majority of EMI class students are non-L1(English) speaking students who are local national students, but class enrollment will also include international students. By 2011, it was estimated that approximately one-third of all university classes in Seoul, South Korea, herein Korea, were offered as EMI classes (Kim, Kweon, & Kim, 2017). However, due to COVID-19, the nation announced that all education would be online, and this included EMI classes. The abrupt 2020 COVID-19 pandemic-induced switch to online learning caused many instructors, including EMI instructors, to struggle, especially those who had never taught or never planned to teach online, and to face an arduous curve learning new or modifying existing instructional and communication strategies as well as demonstrating care and concern (Gillis & Krull, 2020; Johnson, Veletsianos, & Seaman, 2020). Moreover, a number of university EMI students may never have planned for or had had little or no experience with online learning, even though the younger generation is likely quite sophisticated in online resources usage. In other words, EMI students who could have generally been amiable towards online learning expressed dissatisfaction as they felt more tired and pessimistic, and that online learning affected social relationships and motivation beyond academics (Gonzalez-Ramirez et al., 2021).

Given the number of various issues involved in moving from traditional to ERT during 2020 that universities, instructors, and students had to face, it is probable that disappointment with the tertiary education situation, masqueraded as class dissatisfaction, not actual lecture quality or instructional strategy usage satisfaction. Better understanding of EMI tertiary student satisfaction could increase EMI instructor effectiveness, improve pedagogy, and suggest directions for productive change and support on-going development.

Satisfaction during COVID-19 pandemic transition to online learning depended on students' emotional responses to social and technical aspects, and if the student felt successful at online learning (Conrad et al., 2022). In other words, satisfaction shapes positive learning outcomes and is an important requirement for learning success (Sinclaire, 2014), but there is a research gap in the examination of factors mediating the link between engagement and satisfaction, in particular for online EMI classes. The paper hypothesized that a) academic conscientiousness, b) academic integration, and c) instructional strategy use could have a direct effect on satisfaction and mediate the relationship between online engagement and satisfaction. Understanding of the factors that influence satisfaction with online EMI courses has not yet been well explored, particularly among university students. The study seeks to identify factors that mediate the link between engagement and satisfaction, as well as the instructional strategies that students feel are most effective for their different disciplines. By addressing this knowledge gap, the study provides insights into how instructors can improve their teaching practices and increase online EMI course student satisfaction.

1.1 Research Objectives and Questions

The primary research aims of this study are to investigate variables that affect student satisfaction with online EMI courses and to identify mechanisms through which these variables operate. Intensified social distancing measures required instructors around the world to move their lectures online. Korea, like other countries, suffered at the beginning of the pandemic and had very little experience or guidance from the past or other countries. Nevertheless, classroom and online learning will continue to meld after COVID-19 is no longer a threat as the flexibility and range of online learning will be useful and familiar to both educator and students (Lockee, 2021).

To address the knowledge gap on the relationship between student engagement and satisfaction among online EMI learners and to develop efficient teaching strategies for the post-COVID era, research questions for this exploratory study on online EMI class satisfaction are:

RQ1: What instructional strategies do learners consider most useful?

RQ2: What are the relations between learners' background, demographic variables, and variables of interest?

RQ3: What is the relationship between online engagement and satisfaction as affected by a) academic conscientiousness, b) academic integration, and c) instructional strategy use?

RQ4: What factors influence specific aspects of online EMI learners' class satisfaction?

2.   Literature Review

2.1   EMI Satisfaction

Studies have reported positive levels of satisfaction and attitude with EMI classes (Akçayoğlu, Ozer, & Efeoğlu, 2019; Yeh, 2014). For instance, Byun et al., (2010) found that EMI policy was viewed positively in terms of overall satisfaction level, and Yu and Chung (2009) found that EMI class students showed positive attitudes towards EMI class effectiveness on subject matter, motivation, and learning activities. More recently, a paradoxical attitude was found among EMI students in Korea: although only 22% of students in both Korean-mediated Instruction (KMI) and EMI classes stated that EMI classes improved their English skills, most students still support a school EMI policy, in spite of KMI-class students being superior both in class satisfaction and class performance (Kim & Yoon, 2018). EMI, though, is not without dissatisfaction: students favoured L1 classes over EMI classes with regards to English ability, class interaction, and satisfaction (Kim, Kim, & Kweon, 2018), and Lei & Hu (2014) reported over half of their study participants considered EMI unsatisfactory. One EMI study found that overall satisfaction correlated with instructor organisation and that overall satisfaction, instructor encouragement, and instructor organisation were positively linked to task value (Ancliff & Kang, 2017). However, EMI students who do not value EMI classes may not sense satisfaction, especially if classes are mandatory requirements.

At the time of the current study, there was a lack of online EMI satisfaction investigations. However, since then, a literature investigation found three studies on online EMI satisfaction. One investigation of online EMI students in Turkey on the rapid move to ERT found low satisfaction with learning, and there was a significant positive correlation between perceived level of interactional quality and satisfaction (Yüksel, 2022). Likewise, examination of international students' perceptions of ERT in an online EMI class in China found low levels of satisfaction and that low levels of emotional engagement predicted this low level of satisfaction (Tian & Lu, 2022). In an elective blended EMI class—asynchronous and synchronous—student satisfaction remained steady with ERT following an organised, productive structure of combined work (Lin et al., 2021).

2.2   Satisfaction and Engagement and Their Relationship

Student satisfaction, especially with teaching and learning, is valued at universities (Douglas, Douglas, & Barnes, 2006; Ginns, Prosser, & Barrie, 2007). Globally, students' lack of college persistence with online learning and its' consequence of attrition is a recognised concern (Hart, 2012). Research on L1 classes has shown satisfaction with online and traditional learning to be similar (Nichols, Shaffer, & Shockey, 2003; Driscoll et al., 2012). EMI research, on the other hand, has found both high and low rates of satisfaction from students in traditional classrooms (Fernández-Costale, 2017; Kim & Yoon, 2018). The meta-analysis by Gegenfurtner and Ebner (2019) found descriptive differences, but as the effect was negligible, reported satisfaction in interactive online learning to be as high as in traditional classroom or asynchronous online instruction. However, Guest et al., (2018) examining the impact of transitioning from traditional to online did find that online learning lowered class and instructor, to a lesser degree, satisfaction among students. Similarly, a much lower satisfaction level was also reported by Means and Neisler (2021) when traditional university classes shifted to online due to the COVID-19 pandemic.

Engaged students invest effort, time, and emotion into learning (Dixson, 2015). A literature review by Delahunty, Verenikina, and Jones (2013) that revealed that online learners need clear, frequent, and structured opportunities to engage with fellow learners online as they cannot engage physically. In a qualitative case study reporting on the experiences of students, Kahu, Picton, and Nelson (2020) reported student engagement led to satisfaction. In the study, participants' engagement in academic coursework led to positive academic outcomes of knowledge and grades, as well as satisfaction. Farrell and Brunton (2020) also argued that for university students, psychosocial factors such as peer interaction and teacher involvement affected student engagement online as well as course design.

Instructors and course designers can better understand students' needs if they understand online satisfaction with what and how students learn (Rios, Elliott, & Mandernach, 2018). Studies have indicated that engagement impacts learning outcomes; specially, engagement seems to affect quality and depth of learning as well as satisfaction (Meyer, 2014). Engagement, however, was found to be not statistically associated with overall satisfaction (Pelletier et al., 2017). Nonetheless, it was found to partially mediate the effect of instructor presence on student satisfaction (Gray & DiLoreto, 2016). Students have been found to concurrently assess how aspects of an online course and any aspect of engaged learning such as understanding materials, formulating questions, and managing their own learning affects their satisfaction level (Dziuban et al., 2015). Hence, in

addition to satisfaction, persistence is among factors connected to engagement, and interaction with instructors promotes greater effort (Kuh et al., 2006).

2.3 Academic Conscientiousness and Academic Integration and Relationship With Satisfaction

The College Persistence Questionnaire (CPQ) is a validated and reliable six-factor structure tool (Davidson, Beck, & Milligan, 2009; García-Ros et al., 2019). Two factors of interest from the CPQ: Academic Consciousness and Academic Integration could be influencing the effect of engagement on satisfaction. Academic Integration (hereinafter AI for the purposes of this study)—perceptions of learning success and instructor support—has been shown to be one factor influencing online students, especially timely, proactive, and embedded support. Student satisfaction as indicated by continuing and succeeding in their courses, and in attaining a degree, was found to be positively and strongly affected by early, personal, frequent communication, and personal contact, as well as in supportive online class design in which the instructor acted as a guide through the learning process and was readily accessible to student concerns and questions (Stone & O'Shea, 2019). AI, then, positively influences students (Liu & Liu, 2000; Park & Choi, 2009). In particular, faculty services such as instruction, individual student care, fairness and feedback, as well as availability and knowledge of the teaching field were all confirmed to have a positive impact on students' satisfaction (Kieng, Phothikitti, & Vongurai, 2021). However, Parkes, Stein, and Reading (2015) reported that online students felt unprepared to integrate online learning into their lives and did not have the necessary skills.

Academic Conscientiousness (hereinafter AC for the purposes of this study), on the other hand, refers to being organised, hard-working, and adhering to regulations. While Sweeney (2022) found higher conscientiousness associated with an increased preference for face-to-face classes, Bhagat, Wu, and Chang (2019) reported that conscientiousness had a large positive role on students' perceptions of online classes. Namely, AC was found to reliably predict student impressions about online course engagement, anxiety, or preference (Keller & Karau, 2013). Moreover, AC has been found to have a direct effect on students' major satisfaction (Sanchez-Ruiz & El Khoury, 2019). Online requires students to take on more responsibility for their learning, but Casper et al. (2022) reported that during ERT, student amotivation was problematic for self-directed learning. Then, as Radovan (2019) concluded, online learning requires more motivation and effort on the part of students compared to face-to-face education.

2.4 Instructional Strategy and Relationship With Satisfaction

Just as AC and AI could be influencing learners' willingness to study and their desire for deeper learning and in turn could be influencing satisfaction, the instructor's instructional strategy use might either encourage or demotivate a learner to engage. Instructional strategies (hereinafter IS for the purposes of this study) or the specific teaching methods and approaches of the class are essential factors affecting online learning and learning experiences, for learning goals are attained through them, and in the Yang (2017) study, different IS had different impacts with online learning, and the most effective strategies were case studies, video demonstration, instructor's notes, mini projects, and discussion forums.

Elkins and McDade (2021) reported student satisfaction with online learning was related to students' opinions about course design and structure, relationships, and understanding. Smimou and Dahl (2012) confirmed a positive link between students' satisfaction and teaching quality, suggesting that effective online IS that meet both the needs and desires of learners influence satisfaction. Rois et al. (2018) argued that good course design and methods, as well as attention to students' needs, increased student satisfaction, which is critical to the success of online classes.

3. Method

3.1 Theoretical Framework

3.1.1 Factors mediating engagement and satisfaction

In the university online EMI teaching-learning environment, this study conjectures engagement might be indirectly affecting satisfaction through IS and aspects of learning persistence: AC and AI. Küçük and Richardson (2019) have argued that engagement is an additional predictor of satisfaction and because engagement predicts satisfaction in online learners, the *Community of Inquiry* (CoI) framework can help determine useful strategies to promote student engagement and satisfaction. They found teaching presence emotional, behavioural, and cognitive engagement had significant effects on satisfaction in the online environment. Lim, Murdoch, and Cho

(2021) also examined perceptions of teaching and learning as predictors of engagement during ERT and found instructor warmth and openness significantly predicted engagement.

3.1.2 Engagement

Tertiary education has long been interested in student engagement as an important aspect of instruction assessment and effectiveness. Increased student learning through increased effort, time, and commitment to active learning increases learning persistence and success (Jennings & Angelo 2006). Kuh (2009) defines student engagement as the time and effort directly related to student college goals and institutional persuasions of such student activity. Fredricks, Blumenfeld, and Paris (2004) reported three dimensions of engagement: behavioural, emotional, and self-regulation, which contribute to students' learning success and information on the quality of the teaching and learning environment. Engagement together with the CoI framework (Garrison, Anderson, & Archer, 1999), which consist of three essential elements for a transactional learning environment: (a) social presence—participating in the community as an accepted individual, (b) cognitive presence—constructing meaning through community communication, and (c) teaching presence—teachers and students share responsibility for the education experience, contribute to online learning success. Incorporating the CoI model, components of traditional classroom engagement, and social constructivist notions of learning, Dixson (2010) developed an online learner engagement scale to measure online students' behaviours and thoughts in class, their feelings about their learning, and connections to content, instructor, and peers. The meta-analysis by Trowler (2010) found literature about student engagement generally takes for granted its benefits, but student input is usually absent as the literature is written about students for teachers, researchers, managers, and others. This study seeks to therefore investigate engagement from students' perspective, namely satisfaction.

3.1.3 Satisfaction

Tertiary education has also long been interested in student satisfaction. Pelletier et al. (2017), however, found no statistical relations between student engagement and overall satisfaction, so investigation of factors mediating the link between engagement and satisfaction could supplement research. The need to meet students' expectations and have students complete their studies is important in terms of attracting and retaining students (Elliott & Healy, 2001). In order to maximize student satisfaction of a higher education course, it is necessary to know which key factors led to that maximization (Roura et al., 2017). Elliott and Shin (2002) pointed out that student satisfaction has usually been measured by single questions: simple to (a) answer and (b) analyse about overall satisfaction, but these types of questions may not indicate student satisfaction with discrete aspects of their university experience. Reviewing literature on student satisfaction in tertiary education, Weerasinghe, Lalitha, and Femando (2017) point out that after the original use of industry satisfaction models, various higher education-based models and frameworks were developed to measure student satisfaction in different dimensions and different geographical areas. This resulted in contradictions in student satisfaction in the same dimensions as well as different dimensions reflecting similar student satisfactions. However, most previous research concerns face-to-face methodology, and literature regarding key factors in online education is rare but needed because successful completion of online learning relates to satisfaction (Roura et al., 2017; Sachs & Hale, 2003). As such, this study investigates online satisfaction from the relatively unexplored context of online EMI.

3.2 Participants

Currently most major universities in Seoul maintain EMI classes at 30-40% of all offered classes (Jon, Cho & Byun, 2020), which is less than L1 classes at universities in Korea. To investigate online EMI classes, EMI instructors from five different disciplines at universities in the greater Seoul area were requested to upload a questionnaire onto their EMI classes' online lecture rooms and then request students in their classes to voluntarily participate during the first semester of 2020, the first pandemic-induced switch to online semester. After reading the purpose of the research, students gave informed voluntary consent to participate or opt out of the survey. While the questionnaire had 353 respondents, participants who responded with language-based class titles such as *English for Engineers* or did not respond to a large number of questionnaire items were removed from the sample. For the above explained reasons, the study sample size is considered suitable for a study on online EMI class satisfaction, and future studies can give rise to a meta-analysis (Lakens, 2022). The final sample used for analysis consisted of 219 participants and was comprised of a university in metropolitan Seoul (n=52, 23.7%), a university in the greater Seoul area (n=139, 63.5%), and other (n=28, 12.8%) were grouped as: Arts (e.g. *Visual Studio*), STEM (e.g. *Modern Physics*), Business (e.g. *Human Resources Management*), Social Sciences (e.g. *English Teaching Methods*), and Literature and Languages (e.g. *Korean-American Writers and Culture Identity*). This dataset was also used in Lim et al. (2022) after a uniqueness analysis and determination that a new paper could

be written from the dataset (Kirkman & Chan, 2011). There were 200 Korean students (91.3%) and 19 international students (8.7%), 88 males (40.2%) and 131 (59.8%) females, and 3 native speakers of English (1.4%) and 216 (98.6%) non-native speakers of English. Table 1 summarises additional demographics and background information.

Table 1: Participant Particulars

Category	Item	n (%)	Category	Item	n (%)
Year	1st	29 (13.2)		None	165 (75.3)
	2nd	46 (21)		1	28 (12.8)
	3rd	70 (32)	Prior Online Learning	2	6 (2.7)
	4th	74 (33.8)		3	4 (1.8)
Discipline	Arts	19 (8.7)		4[(+)]	16 (7.3)
	STEM	24 (11.0)		None	80 (36.5)
	Business	31 (14.2)		1	39 (17.8)
	Social Sciences	92 (42.0)	Prior EMI Learning	2	40 (18.3)
	Literature & Languages	47 (21.5)		3	10 (4.6)
	Non-response/Other	6 (2.7)		4[(+)]	50 (22.8)

3.3 Survey Instrument

The online survey, offered in both English and Korean, allowed participants to respond in their preferred language. It collected demographics information and respondents' perceptions of (a) valuable IS and (b) AC (all 3 scale items) and AI (all 8 scale items), scales from the CPQ by Davidson et al. (2009). The survey also included the 19-item Online Student Engagement Scale (OSE) by Dixson (2015), and researcher-designed items for satisfaction (hereinafter S) (5 items such as 'satisfaction with instructor care' and 'satisfaction with outside class interaction'). Items were assessed on a 5-point Likert scale (0-very little to 4-very much) and modified to directly reference EMI. A link to the survey was uploaded onto the online lecture rooms of EMI instructors who agreed to allow the link. The link opened from week 5 to 10 of the 15-week spring 2020 semester. Students, after reading the purpose of the survey, voluntarily participated.

4. Results and Data Analysis

This study used Stata 14.0 for data analyses. The collected survey data were analysed using independent samples t-test to confirm significant differences among variables, correlation analysis to confirm relationships between factors, Structural Equation Modelling (SEM) to explore structural relationships between factors, and multiple regression analysis to assess the strength of those relationships. As Vardeman and Morris (2003, p. 26) argue: "you must absolutely never use any statistical method without realizing that you are implicitly making assumptions," researchers performed analysis using the tools mentioned above within those assumptions.

4.1 Results

RQ1: What instructional strategies do learners consider most useful?

Students most often used 'uploaded pre-recorded lecture videos' (IS2, 51.6%) followed by 'video conference calling software' (IS1, 48.9%) and then 'slideshows & uploaded lecture audio files' (IS3, 42.5%). They also made use of 'SNS messaging with professors & classmates' (IS4, 27.9%), 'emailing with professors & classmates' (IS5, 31.5%) and others such as YouTube resources, L1 use, and in-person feedback (IS6, 1.8%).

RQ2: What are the relations between learners' background, demographic variables, and variables of interest?

Significant ANOVA results are presented in Table 2. AC was significantly higher in national compared to international students, but international students used more strategies than national students. First-years' AI was higher than upper-year students'. Students with more EMI experience used more strategies, particularly students who took 4[(+)] prior EMI classes compared to only 1 (*p* = .028) or 2 (*p* = .039). IS was statistically significantly higher among Literature & Languages compared to STEM (*p* = .004), Business (*p* = .008), and Social Sciences (*p* =. 023). For S, 'with instructor care' was higher in Social Sciences than STEM (*p* = .037) and Literature

& Languages than STEM (p = .029), and 'with instructor warmth' was higher in Social Sciences than STEM (p = .009) and Literature & Languages than STEM (p = .003).

Table 2: Group Differences

	Category	Item	Mean	s.d.	F / Prob.
Academic Conscientiousness	Nationality	Korean	10.57	2.23	10.46**/.00
		International	8.79	2.86	
Academic Integration	Year	1st	29.38	4.35	2.76*/.04 1–3* 1–4*
		2nd	27.39	4.46	
		3rd	26.67	4.32	
		4th	26.70	5.08	
Instructional Strategy	Prior EMI Learning	0	2.10	1.21	3.29*/.01 4(+)–1* and 2*
		1	1.67	0.84	
		2	1.70	0.88	
		3	2.30	0.82	
		4(+)	2.38	1.38	
	Nationality	Korean	1.97	1.09	4.94*/.03
		International	2.58	1.57	
	Discipline	Arts	2.21	1.23	4.00**/.00 L&L–STEM*, B*, and SocSc*
		STEM	1.54	0.93	
		Business	1.68	0.91	
		Social Sciences	1.95	1.03	
		Literature & Languages	2.57	1.41	
Satisfaction	With class progress	Arts	3.42	1.02	2.36*/.04
		STEM	3.63	0.88	
		Business	3.68	0.75	
		Social Sciences	3.87	0.79	
		Literature & Languages	4.04	1.00	
	With instructor care	Arts	3.84	1.07	2.91*/.02 SocSc–STEM* L&L–STEM*
		STEM	3.63	0.88	
		Business	4.00	0.73	
		Social Sciences	4.18	0.78	
		Literature & Languages	4.26	0.82	
	With instructor warmth	Arts	3.89	1.05	3.57**/·00 SocSc –STEM* L&L–STEM*
		STEM	3.42	1.10	
		Business	3.87	0.76	
		Social Sciences	4.14	0.87	
		Literature & Languages	4.30	1.00	

Note: B: Business, SocSc: Social Sciences, L&L: Literature & Languages

RQ3: Academic conscientiousness (AC), academic integration (AI), and instructional strategy use (IS) could have a direct effect on satisfaction and mediate the relation between online engagement and satisfaction.

SEM was used to understand the effects of factors on S. Table 3 presents correlations to first understand their relationships. Relationships between skills and emotion, between emotion and participation, and between AI and S were found to have strong positive correlation (from 0.6 to 0.8). The relationships between skills and a) participation, b) performance, and c) AI, between emotion and a) performance and b) AI, and between participation and performance were found to have moderate positive correlation (from 0.4 to 0.6).

Table 3. Correlations Among Variables

	1	2	3	4	5	6	7	8	9	10	11	12	13
1	1												
2	.08	1											
3	-.15*	.09	1										
4	-.03	-.09	.29***	1									
5	-.01	.00	.10	.24***	1								
6	.10	-.08	-.06	.16*	.11	1							
7	.02	-.12	-.14*	.08	.10	.71***	1						
8	-.06	-.07	-.08	.17*	.03	.46***	.64***	1					
9	.06	-.22**	.05	.19**	.03	.57***	.58***	.49***	1				
10	.13	.21**	-.05	-.01	-.01	.31***	.15*	.04	.25***	1			
11	.05	.01	-.16*	.03	.06	.44***	.48***	.38***	.32***	.34***	1		
12	.03	-.03	-.18**	-.01	.03	.35***	.36***	.25***	.20**	.24***	.73***	1	
13	-.11	-.15*	.08	.10	.001	-.01	.14*	.13	.10	-.12	.09	.20**	1

*p<0.05, **p<0.01, ***p<0.001

Note: 1:Gender, 2:Nationality, 3:Year, 4:Prior EMI Learning, 5:Prior Online Learning, 6:Skills, 7:Emotion, 8:Participation, 9:Performance, 10:Academic Conscientiousness, 11:Academic Integration, 12:Satisfaction, 13:Instructional Strategy.

The SEM variables were the average scores in sections. Endogenous variables included observed variables (AC, AI, S, and IS), and the exogenous variable was OSE. The model hypothesised:

- OSE has an indirect effect on S through AC, AI, and IS.
- AC, AI, and IS have direct effects on S.
- AC is correlated with AI and IS.

Results indicated good goodness-of-fit for the proposed model (X^2/df = .58/2 = .286, CFI = 1.00, TLI = 1.03, RMSEA = .00). Having established model fit, the results of SEM were investigated. The Cronbach's alpha coefficient was .663, suggesting that the five factors (observed variables) have relatively high internal consistency. Table 4 shows the effect results of model analysis, and Figure 1 shows the confirmed research model.

Table 4: SEM Analysis

Effect	Pathway			$\mathcal{B}$	S.E.
Direct	AC	←	OSE	-.24**	.08
	S	←	AI	.95***	.06
			AC	.16***	.05
			IS	.46**	.15
	AI	←	OSE	.44***	.05

Effect	Pathway			$\mathcal{B}$	S.E.
Indirect	IS	←	OSE	.04	.02
	S	←	OSE	.44***	.06
Total	AC	←	OSE	.24**	.08
	S	←	AC	.02***	.05
			AI	.95***	.06
			IS	.46**	.15
			OSE	.44***	.06
	AI	←	OSE	.44***	.05
	IS	←	OSE	.04	.02

*p<0.05, **p<0.01, ***p<0.001

The model indicates that the average score in S was directly influenced by AI, AC, and IS (positively), and indirectly by OSE (positively). OSE had a significant direct influence on AI and AC (positively). Also, AC was positively correlated with AI, but inversely correlated with IS.
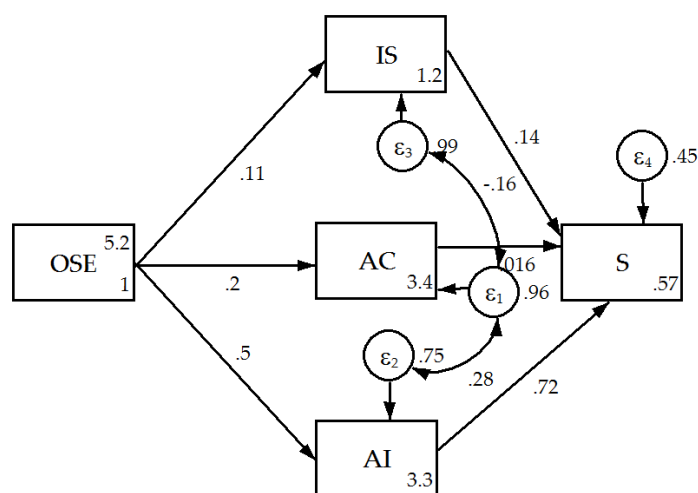

Figure 1: SEM Model

RQ4: What key factors influence specific aspects of online EMI learners' satisfaction with class?

SEM revealing the bigger picture prompted regression estimation calculations (Table 5) to investigate predictors of individual items of S. First, a collinearity test confirmed no collinearity in the estimation. Prior online learning was inversely associated with S3. IS variables are marked dummy variables if they used such strategies, and students were found to be more satisfied in S3 and S4 if they used SNS to consult with instructors and friends (IS4) while email correspondence (IS5) was found to be helpful in S4. OSE participation was inversely associated with S3, and if students frequently miss class (AC1), they may compromise S, especially S1 and S2. AI2, AI3 (especially), AI5, and A16 were positively associated with S.

Table 5: Satisfaction Regression Estimates

Variable Item	Satisfaction Items				
	S1	S2	S3	S4	S5
Gender	-.10	-.15	-.05	.19	.16
Nationality	-.08	-.02	-.10	.04	.03
Year	-.049	-.03	-.02	-.01	-.08

Variable Item	Satisfaction Items				
	S1	S2	S3	S4	S5
Prior EMI Learning	.01	-.03	-.03	-.01	-.01
Prior Online Learning	.05	-.02	-.09*	-.04	.07
Instructional Strategies (IS)					
IS1	.02	.12	.18	.03	.09
IS2	-.10	-.13	-.03	.04	.17
IS3	-.03	.02	-.10	.03	.14
IS4	.05	.04	.31**	.39**	.18
IS5	-.04	.06	.16	.30*	.11
OSE Component Factors					
Skills	.05	.18	.09	.14	.01
Emotion	.08	.06	.10	.14	-.19
Participation	-.05	-.16	-.20**	-.10	-.05
Performance	-.07	-.13	.01	-.09	.01
Academic Conscientiousness (AC)					
AC1	-.16*	-.20**	-.06	-.05	.07
AC2	.06	.08	.05	.00	-.05
AC3	.05	.08	.08	.06	-.01
Academic Integration (AI)					
AI1	.06	-.05	.08	-.10	-.01
AI2	.23**	.19*	.01	-.06	.34**
AI3	.38***	.39***	.31***	.43***	.25**
AI4	-.06	-.01	.14	.04	.14
AI5	.14*	.13	.01	.15	.13
AI6	-.00	.01	.08	.14*	.08
AI7	.03	.07	.07	.08	.07
AI8	.08	.00	.06	.07	.03
Constant	1.10**	1.75***	1.35**	0.77	0.45
Observations	219	219	219	219	219
R-squared	.60	.50	.54	.51	.46
Adj R-squared	.55	.44	.48	.44	.40

*p<0.05, **p<0.01, ***p<0.001

Note: S1:overall, S2:class progress, S3:instructor care. S4:instructor warmth; S5:instructor office hours & outside class interaction, AC1:Absent for reasons other than illness*, AC2:Assignment submission past due dates*, AC3:Disinterest & do as little as possible for class*, AI1:Understand instructor's thinking in lectures & when they ask students questions, AI2:Content with personal intellectual growth & class ideas, AI3:Content with quality of instruction, AI4:Instructor is

concerned with my intellectual growth, AI5:Interest in things said during class discussions, AI6:Connection between learning & my career possibilities, AI7:Instructor imposes unreasonable requirements & enjoys students' distress, AI8:Discontent with amount of instructor interaction*, *reversed

5. Discussion

5.1 RQ1: Instructional Strategies Considered Most Valuable

Our findings indicate that over fifty percent of students endeavoured to address their learning independently. However, like the Yang (2017), students offered differing opinions on the most effective strategies. Group discussions held via video conference proved to be an effective approach for elaborating their ideas. Approximately one-quarter of the participants sought concise and immediate feedback from both their peers and instructors, while a third opted to compose emails containing their questions. Overall, students demonstrated a preference for immediate feedback over-elaborated responses. This is comparable to Smimou and Dahl (2012) and Rois et al. (2018) as the needs of learners were being met, as well as Elkins and McDade (2021) who reported satisfaction with online learning related to students' opinions about course understanding. However, it should be noted that the study did not differentiate between feedback provided by peers and instructors, making it unclear which type of feedback was preferred by the students.

5.2 RQ2: Relations Between Learners' Background, Demographic Variables, and Variables of Interest

On the national ranking of conscientiousness, Korea ranked among the top 10 (Mõttus et al., 2012). A powerful cultural influence could be influencing Koreans students to have high AC. Korean students take EMI classes in their home nation, which has advantages but also disadvantages and pressures. As such, Korean EMI students might have Korean expectations from parents, instructors, and friends. Study situations and expectations differ among nations, and international students may be operating with different home cultural pressures. As the finding appears culturally influenced, supplementary studies are needed.

Similar to Rienties et al. (2011), this study also found that the AI of international students was not worse than national students. However, this study found first-years' AI higher than third and fourth years. As students mature as adults and develop as university students, AI perceptions could change. Future studies might examine AI in relation to year at school.

International students and students with more EMI experience used more IS. That is, local EMI class students will be in a familiar, or at the least, less unfamiliar, learning environment, and as such, simply may not need a broad range of IS to succeed. International students could be incorporating more IS to succeed (at the same level) as local students. These learners also need to navigate in English and Korean, both of which they may not have actively used before, and this situation could necessitate the use of more IS. In case of EMI class experience, it could be that students have learnt to incorporate the practice of more strategies in order to realise success because of exposure to different EMI instructors and their different approaches, personalities, and expectations. These students might have higher self-efficacy as IS learnt or employed in previous EMI classes may have become learning strategies; Diseth (2011) found that self-efficacy strongly correlates to learning strategies. Additional research, however, would shed clearer light on this.

Students in Literature & Languages might be using more IS as they are processing information differently than the other study disciplines. They may need to integrate information and skills in more emotional and abstract ways than what might be expected or done in the other disciplines. For instance, 'Why must Elizabeth Bennet marry?' differs from 'How is the lift equation calculated?' STEM course student satisfaction was found to be related to teaching methods, instructor organisation and attitude towards subject and students, and workload (Chang & Park, 2014). The findings for STEM students in this study appear to link to the argument of Rois et al. (2018) that good course design, methods, and attention to learner needs connect to satisfaction. In this study, STEM students were less satisfied with class progression and instructor care and warmth. It could be that these online EMI students simply are more concerned with lecture content; STEM students might be rating information and facts more highly. The most efficient instructor for STEM students may not need to be the warmest but one who can convey facts and connections clearly and efficiently. Discipline differences offer opportunities for further studies.

5.3 RQ3: Direct Effect and Mediated Effect on Satisfaction

Results suggest students have generated a positive cycle of success. That is, correlations suggest the more students learn, the more they can learn, and the better they get at something, the more positive the reinforcement they get. This is comparable to Kahu et al. (2020) who reported engagement led to satisfaction.

Moreover, the results lend support to the findings of Hwang and Wao (2021). While they did not report a causal relationship between satisfaction and engagement, they did report "that highly satisfied students tend to be engaged in educational activities and vice versa." The results also support Yüksel (2022) who found perceived interactional quality correlated to satisfaction, and Tian and Lu (2022) who reported students' emotional engagement level predicted their level of satisfaction.

Findings of this study support Farrell and Brunton (2020) who argued psychosocial factors influence online engagement and lend further insight to findings in Küçük and Richardson (2019) in which engagement: emotional, behavioural, and cognitive, were significant predictors of satisfaction. Engaged students were found to have higher AI and AC and that combined with use of IS influenced S. The model differs from the results of Liu and Liu (2004) who reported AI did not directly affect S but supports Stone and O'Shea (2019) who reported S was affected by positively perceived learning and support. Moreover, the model shows similar results with Keller and Karau (2013) who found individuals with high levels of conscientiousness were more likely to have favourable views of online classes and Bhagat et al. (2019) who reported conscientiousness had a large positive impact on online learning perception. OSE, however, did not directly influence IS, suggesting students may not need to engage in a variety of IS. The use of a limited number or one strategy could be all that is needed to feel satisfied. This conjecture could also account for a rise in AC bringing about a decrease in IS in the model. Students might have noticed what works for themselves and their peers, and from this, know what the instructor will and will not accept or tolerate. Oh (2021) also reported that in terms of instructional mode, participants in the study preferred non-real time instruction, in particular the class videos that contained a slideshow and instructor audio explanations, as well as the class notes and extra class materials that helped content understanding. Simplification might increase efficiency and decrease wasted time; they have a working strategy and that combined with high AC and AI, which increases when students are engaged, can increase online EMI satisfaction. Future studies might examine the use of specific IS and whether more or less influence satisfaction.

5.4 RQ4: Key Factors Influencing Specific Aspects of Online EMI Satisfaction

Two inverse associations between S (instructor care) and i) prior online learning experience and ii) participation OSE were unexpected. Students might not feel a caring attitude to be important. This is unlike Arbaugh (2001) who found the immediacy behaviours of instructors and prior online learning experience positively predicted satisfaction. It is also dissimilar to Tsai, Ku and Campbell (2021) who reported high online interaction with peers and the instructor resulted in more favourable perceptions of engagement and learning outcomes among students. Learners in this study might have had a harder time perceiving care in the unfamiliar (possibly new) environment. Other students could be prone to heightened anxiety, perhaps even fearing penalisation for not reaching (perceived) participation expectations and standards. Research on whether less and how participation expectation affects online EMI satisfaction is warranted.

AC1 (absence from class for reasons other than illness) was inversely associated with i) general and ii) class progression satisfaction. It could be the more a student is present, the higher the student perceives instructor expectations and the less they can avoid doing or engaging in required tasks. On the other hand, attending a teacher-fronted lecture necessitates being a passive learner. As such, students may perceive there to be no difference between attending class and group or alone study. Future studies might examine attendance and instructor policies regarding attendance.

In line with Kieng et al. (2021) who found faculty services positively impacted satisfaction, AI items in this study had positive associations with S. Personal fulfillment when combined with good instruction might result in higher satisfaction. Examining Chinese, Indian, and South Korean undergraduate students in the UK, Merola, Coelen, and Hofman (2019) also found AI explained over 14% of the variance in S. Given dissatisfaction issues, students might simply have wanted to feel they are getting what they paid for—quality instruction from interested organised instructors in a structured, welcoming atmosphere with support and encouragement from instructor and peers. Oh (2021) also found students did not perceive online instruction as offering more study opportunities or goals than the classroom. Moreover, AI cannot be underestimated, regardless of content or direction. For instance, facing a frightening and exciting future, upper-years' AI and S could certainly differ from those of lower year students.

Through email an instructor can expand communication beyond salutations to support and feedback whereas through SNS an instructor can provide more concise short notices. Both strategies are interactions that express interest and concern. Gaytan and McEwen (2007) also reported continual, immediate, and detailed feedback and appropriate use of emailing among the top three elements of quality online instruction. For instance, a

simple salutation may mean quite a bit to students, especially those new to EMI and online, as it indicates personal interest and openness to continued communications.

6. Conclusion

The concerns of the research questions were addressed in that for *RQ1*, online EMI learners found video live-stream conferencing and pre-recorded lecture videos were important. For *RQ2*, international students and students with more prior EMI learning experiences used more IS. IS use and S were found to differ amongst disciplines, the AC of national students was higher than international students, and the AI of first years was higher than that of 3rd and 4th years. Analysis of factor effects on S for *RQ3*, revealed AI, AC, and IS mediated the link between EMI distance learner OSE and S. Noteworthy, for *RQ4*, AC was inversely associated with IS and OSE did not directly influence IS.

Classroom Implications

Prior to the COVID-19 pandemic, education systems have been disrupted such as by the 2015 Hurricane Katrina, the 2010-2011 Canterbury earthquakes, and the 2003 SARS virus resulting in closures of schools and cancellations of classes from a few days to an entire school year (Casper et al., 2022). However, COVID-19 caused approximately three years of adjustment, stress, strict social distancing interventions. Nevertheless, it brought about increased familiarity with more online resources and alternatives for social or academic interactions such as online conference meetings that had been unavailable or uncommon earlier, and which had not been thoroughly exploited for academic purposes in the previous disruptions. Casper et al. (2022) argued that understanding the link between engagement and satisfaction can help provide quality online learning and reduce student stress connected to a lack of support and increase motivation necessary for self-directed online learning. Results suggest that an instructor perceived as supportive might be considered patronising by an upper year student looking beyond university to the future, yet a first-year might be seeking support, structure, and guidance from their instructors. For STEM students, they could be looking ahead to the next step whereas for instance, Literature & Languages majors will already know Romeo dies. STEM students could just be more concerned with work and verification; i.e., they seek more factual accuracy than warm fuzzy feelings from their instructors. Next, too much interaction could be making learners nervous. Polite requests to participate and genial concern is one thing, but intense continued requirement or pressure to participate may make students feel they are doing something wrong or that standards are higher for them. Last, emailing could allow for lengthy interactions or provision of helpful guidelines. Whereas SNS, as a faster, more convenient, and personal means of interacting, could facilitate short quick answers and encouragement. Students may simply wish to interact with their instructor. Moreover, students may feel supported but not stressed by a SNS message and respond more positively to simple social interaction (i.e., sometimes less is more). Next, SNS communications show interest, support, and warmth, so they could be viewed as more valuable than the actual conveyed information. Post-pandemic, Bozkurt and Sharma (2020, p. iii) also argued that "people will not remember the educational content delivered, but they will remember how they felt, how we cared for them, and how we supported them."

While the relationships cannot be interpreted as causal ones, the SEM model proposed for this study and its complement regression analysis provide important insight into and contribute to a general view of factors affecting online EMI learners' perspective of class satisfaction. Researchers also acknowledge that there are other factors affecting satisfaction besides those examined in this study. Nonetheless, results are important because online EMI could continue post-pandemic. The sample, however, contained few international students, for which the reason is speculated to be the smaller numbers in the nation at the time due to traveling difficulties because of COVID-19. While the effect of group differences is crucial in EMI learning, the sample size in this study was not large enough to run the SEM model by groups. Additional studies should consider these situations and aim to connect with a larger EMI academic community. Future studies should also compare EMI satisfaction between online and traditional and blended learning.

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