Strategic Transformation of Education Delivery: Online Learning in The Phase of Covid-19 Pandemic and Recovery in Indonesia

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Abstract

The revelation of COVID-19 shook the world in 2020, and lives have changed since then. Due to the COVID-19 epidemic, virtual or online class has become a requirement for all schools, colleges, and universities across the globe. Despite the fact that no one was prepared for it, the COVID-19 epidemic has compelled every educational institution to adopt online learning. Some view this strategy positively, while others do not. The purpose of this study is to evaluate and review students' perceptions of learning and satisfaction with virtual class. The primary data collected measures students' perceptions of learning and learning satisfaction. This study utilised stratified sampling with a sample size of 158 students from several colleges and universities in Surakarta, Indonesia. This study examines how interaction, student motivation, course structure, instructor facilitation or knowledge and students' perceived learning may influence students' learning satisfaction and demonstrates that virtual or online learning has grown in popularity among students all over the world, especially during the COVID-19 pandemic and recovery stages. The findings add to the practical and theoretical implications wherein a number of useful recommendations for stakeholders to enhance the quality of the instructional process may be presented. During a period of sudden and extensive changes to Indonesia's higher education system, the study offers useful insights into the strategic transition, particularly for university administration, into how the educational process developed.

Keywords: Strategic Transformation, Virtual Classroom, Online Learning, Students Perceived Learning, Student Satisfaction

Introduction

Lifelong education is so crucial that it cannot be interrupted for any reason (UNESCO, 2022). The revelation of COVID-19 shook the world in 2020, and lives have changed since then. Students, including the learners, underwent a transformation in learning methodologies. Traditional face-to-face learning is being drastically replaced by online learning. Online learning or virtual classroom, commonly known as a part of e-learning, has attracted a great deal of attention due to contradictory perspectives regarding this type of education (Chan & Ko, 2020). Some view this strategy positively, while others do not. On the plus side, e-learning allows for flexible learning. The recorded lectures can greatly enhance a student's learning experience because they can always refer back to them to increase their understanding. It may also help students who are absent from class make up on their education. Nonetheless, some students may lack motivation to study during online sessions (Caskurlu et al., 2020). They receive worse grades because

it is more difficult for them to clarify difficult topics in online classrooms compared to in-person sessions, resulting from their inability to adequately define these concepts. This ambiguous scenario has made academics, educators, and other professionals keen to determine whether the e-learning method is superior to the old one. Examining student contentment and motivation is the most effective method for discovering the answer (Martin, Chuang, & Sadaf, 2018). Numerous comparison studies have been conducted to evaluate whether face-to-face, online, or hybrid learning is more effective. As a result of these, students are more reliant on themselves to obtain answers and gain new information. Students' course completion, contentment, and motivation are observed to increase when they utilise the online learning technique. Some students' lack of motivation, dissatisfaction, and attend ance would be its flaw. Regardless of learning styles, course design will always play a significant role in obtaining favourable outcomes and, as a result, influence student happiness (Baber, 2020).

The COVID19 pandemic has compelled all educational institutions to transition to online learning, despite the fact that no one was prepared. Numerous research have determined that the switch to online learning is a sudden but crucial step for maintaining the learning process. This transition's abruptness prompted a discussion regarding learning quality and student satisfaction. During this crises, students' perceptions of their own learning may have an impact on their overall contentment. Consequently, the purpose of this study is to examine students' perceptions of learning and satisfaction with online learning. The direct effect of variables on student satisfaction may be explored in this study. The independent variables consist of two parts: online class participation and online learning. Online class engagement is comprised of interaction and student motivation, while online learning is comprised of course structure and instructor facilitation or knowledge. In addition, this research was anticipated to contribute to the strategic transformation of learning delivery for institutional leaders. Aside from that, it will uncover the factors that motivate students to actively learn and influence student contentment.

Literature Review

In this new era of rapidly developing technology, online learning has become one of the most crucial tactics (Othman, 2022). Without access to technology, it is difficult to contact with lecturers and acquire fresh resources from the internet, despite the benefits of technology (Hizam et al., 2022). By possessing the device and the internet, users have access at any time and in any location. However, this epidemic has significantly impacted education and students in numerous ways. Students who are currently studying during the Covid-19 pandemic face numerous obstacles. As a result of the conversation over educational institutions, teachers and students must urgently adjust to online learning. Even throughout this pandemic, education is not excluded.

Interaction

Alamri and Tyler-Wood (2017) state that synchronous and asynchronous tools, such as audio channels, e-mail, and discussion boards, can be used to facilitate participation in online courses. According to Ku, Tseng, and Akarasriworn (2013), interaction is an essential aspect for perceived student learning and motivation in online courses. One of the challenges with online education is that students feel distant from their peers and instructors. However, presenting tasks that include current concerns can

help students use critical thinking and may also increase their participation with their classmates during class discussions. To ensure students' pleasure with online learning, they must offer innovative learning environments for students. The teacher must also complete their education preparation in order to make the necessary decisions, choices, and modifications in order to fulfil not only the expectations of the students, but also the requirements of teacher education and the operating conditions of both universities and schools. Alqurashi (2019) observed that "learner-content and learner-instructor interactions are key predictors of student perceived learning and satisfaction, whereas learner-learner interaction is not as significant." It demonstrates that the interaction in online classes has a beneficial effect on the perceived learning outcomes of students.

Student Motivation

A person's motivation is an internal force that drives them to act or advance toward a goal (Harmon-Jones & Price, 2013). According to Cole, Feild, and Harris (2004), they defined "student motivation as the power, creativity, and readiness of students to learn and participate in classroom learning". Based on the past research, it was mentioned that motivation is a fundamental method of keeping students satisfied in an online learning environment and that motivated students are more successful. In the past research, Bulić and Blažević (2020) recommended an inverse relationship between student motivation and online teaching. Students are more motivated to learn in these surroundings because of the modern teaching methods and online environment. In order to have a positive relationship among the variables, we need to change the environment of our online learning as it influences the student's motivation towards studies and keeps the satisfaction in the online class setup. In this research, it helps students to be self-motivated and provide them with the positive pathway to relationships. According to a case study of adult distance education students conducted by Chyung, Winiecki, and Fenner (1998), the reason for dropouts from online courses is dissatisfaction with the learning environment. In the past research, it was discovered no link between self-determined motivation and student learning outcomes (Chen & Jang, 2010). Hypothesis 2 shows that student motivation in online class does have a positive influence on the student's perceived learning outcomes.

Course Structure

Moore (1991) stated that the course structure "expresses the rigidity or flexibility of the program's educational objectives, teaching strategies, and evaluation methods," and "the extent to which an education program can accommodate or be responsive to each learner's individual needs". The usefulness of the topics and the arrangement of the topics in such a way that it is reasonable and accessible by a student in the course structure will provide a positive learning result and enhance the student's satisfaction. In this research we can find out, the more structured and comprehensive the course structure, the more pleased students would be with their course learning. It was discovered that quality courses had the following features: clear and concise goals, well-organized content, a variety of prospects for interpersonal communication, and effective use of technology. The course structure provides development, organization, design, pedagogies and methodologies. This detail will give a push to increase the outcomes of learning and eventually help to upgrade the satisfaction of students in the course. Educators create plans for anticipated lessons and assignments for students to produce good outcomes (Gray & DiLoreto, 2015). In the past research, Eom, Wen, and Ashill (2006) found "course structure significantly influencing student satisfaction", which is similar to the findings of Gray and DiLoreto (2016). However,

Eom et al. (2006) concluded that "there is an insignificant relationship between course structure and the learning outcome", which contradicts the findings of Gray and DiLoreto (2016). Hypothesis 3 shows that course structure in online class does have a positive influence on the student's perceived learning outcomes.

Instructor Facilitation/Knowledge

The effectiveness of instructor-led facilitation and social engagement is a key determinant of online learning efficiency. Instead of using traditional teaching methods, an instructor's role in an online environment is to motivate, mentor, and trigger critical thinking in students while giving them freedom of choice and responsibility (Huynh, 2005). According to Jones (2016), they stated that "the instructor should facilitate the discussion in an online class not only between learner and instructor, but also between learners". So, during online courses, teacher presence and a sense of learning in a group seem to have a positive correlation in which one affects the other's development and opposite. In the research we find out how good the instructor is during online learning and how their knowledge and facilitation can affect the relationship among the variables. When instructors take part in online discussions by responding quickly, requesting follow-up inquiries, and soliciting student feedback on how to improve the course, their students perceive the teacher's presence to be stronger. The importance of instructor-led facilitation and social presence in online learning is a critical determinant of its effectiveness (Ladyshewsky, 2013). Based on the past research, according to Eom et al. (2006), it was found that "instructor knowledge and facilitation significantly influenced student satisfaction, however, was insignificant in determining the learning outcome". It shows that hypothesis 4 which is Instructor Facilitation/Knowledge in online class does have a positive influence on the student's perceived learning outcomes.

Conceptual Development of Student Perceived Learning and Satisfaction

The combination of students' reported learning and satisfaction will provide a clearer picture of online learning performance (Gray & DiLoreto, 2016). It is essential to understand the elements that motivate students to pursue online education; hence, we are distributing surveys to do so. After that, the survey findings will be analysed and used to anticipate the inadequacies of online learning. Then, specific modifications can be made to improve e-learning in the future. There is a substantial relationship between students' impressions of learning in general and their happiness with online education. In the research, we can determine whether the perceived learning outcome is a positive contributor to student satisfaction and a positive factor in the students' relationships. According to Marks, Sibley, and Arbaugh (2005), "satisfied students are an immediate consequence of a successful learning experience, and the perceived student learning outcome is a strong predictor of student satisfaction in online learning." It was stated that a satisfied student is the immediate key to a successful learning experience, and it was found that the perceived student learning outcome is a powerful predictor of student satisfaction in online education (Marks, Sibley & Arbaugh, 2005). According to previous research, Ikhsan, Saraswati, Muchardie, and Susilo (2019) discovered that "perceived learning outcomes contributed to and positively influenced student happiness in the online environment." The fifth hypothesis demonstrates that perceived learning outcomes have a beneficial effect on student satisfaction.

Table 1: *Measurement and Items*

|	Interaction	Sources
	Interaction	
1	I frequently interacted with other students in the course.	Sources: Gray, J.A. & DiLoreto, M. (2016) and Nambiar, D. (2020).
2	I regularly communicated with the instructor of the course.	
3	The learning activities promoted interaction with others.	
4	There were no opportunities for active learning in this course.	
5	I had the opportunity to introduce myself to others in the class.	
6	I communicated often with other students within the course.	
7	I received ongoing feedback from my classmates.	
8	There is a lack of teacher-student interaction in online classes.	
9	It is difficult to control group interaction during online classes.	
10	Teacher- students disconnect is felt low in online classes compared to classroom method.	
1	I do not feel motivated to participate in online class discussions.	Sources: Nambiar, D. (2020) and Eom, S.B. & Ashill, N. (2016)
2	I feel a lack of motivation to take online classes.	
3	I get easily distracted during online classes.	
4	I am finding it difficult to adapt to the online teaching mode	
5	I feel lazy and disinterested during online classes.	
6	I do all that I can to make my assignments turn out perfectly.	
7	I work hard to get a good grade even when I don't like a class.	
1	Student learning outcomes were aligned to the learning activities.	Sources: Gray, J.A. & DiLoreto, M. (2016) and Eom, S.B. & Ashill, N. (2016).
2	The purpose of the course was clearly presented.	
3	The layout of the course was disorganized.	
4	Course navigation was illogical.	
5	Instructions about student participation were clearly presented.	
6	The structure of the modules of this online class was well organized into logical and understandable components	
7	The course materials of this online class supplied me with an effective range of challenges.	
8	The course materials of this online class were interesting and stimulated my desire to learn.	
	Instructor Facilitation/Knowledge	
1	The instructor's feedback on assignments was not constructive.	Sources: Gray, J.A. & DiLoreto, M. (2016), Eom, S.B. & Ashill, N. (2016), and Martin, F., Wang, C., & Sadaf, A. (2018).
2	The instructor's feedback on assignments was clearly stated.	
3	The instructor cared about my progress in this course.	
4	I learned from the feedback that was provided during the course.	
5	The instructor was actively involved in facilitating (teaching) this online class.	
6	The instructor in this online class provided timely helpful feedback on assignments, exams or projects.	
7	The instructor in this online class stimulated students to exert intellectual effort beyond that required by face-to-face classes.	
8	The instructor in this online class was responsive to student concerns.	
9	Instructors use various features in synchronous sessions to interact with students.	
	Student Perceived Learning	
1	The learning activities promoted the achievement of student learning outcomes.	Sources: Gray, J.A. & DiLoreto, M. (2016), Nambiar, D. (2020), and Alqurashi, E. (2018).
2	I am pleased with what I learned in the course.	
3	I learned skills that will help me in the future.	
4	The learning tasks enhanced my understanding of the content.	
5	I learned less in the course than I anticipated.	
6	The course contributed to my professional development.	
7	Online classes help me to use innovative teaching methods.	
8	Online classes make me conscious about my learning skills.	
9	In your estimation, how well did you learn the material presented in this course?	
	Student Satisfaction	
1	I am satisfied with the level of student interaction that occurred in the course.	Sources: Gray, J.A. & DiLoreto, M. (2016), Nambiar, D. (2020), and Alqurashi, E. (2018)
2	I am satisfied with my learning in the online classes.	
3	I am satisfied with my overall experience in these online classes.	
4	I am satisfied with the instructor for the online classes.	
5	I am satisfied with the content of the course.	
6	There is a lack of work satisfaction while taking online classes.	
7	Overall, I was satisfied with my online learning experience.	
8	This online course met my needs as a learner.	

Methodology

Students from various universities and programmes in Surakarta, Indonesia who are currently offering online classes were contacted and invited to participate in an online survey to collect the data. This study collects data by administering a standardised questionnaire to 161 undergraduate students and collecting their responses. For data collection, a quantitative

method was used. Due to the current COVID-19 issue, the poll was performed online using Google forms, and URLs were distributed to students via a Whatsapp group of professors. The interaction, student motivation, course structure, teacher facilitation or knowledge, students' perceived learning, and students' satisfaction questionnaire items were adapted and reworded from several journals. The survey consisted of a cross-section of three demographic questions and fifty-one questions concerning the determinants of students' perceived learning outcome and satisfaction with online learning during the covidian influenza pandemic. The characteristics displayed in Figure 1 were obtained from prior research (Baber, 2020).

In this study, the independent variables were interaction, student motivation, course structure and instructor facilitation or knowledge. The dependent variable for the study was student satisfaction, while the student perceived learning outcome was a mediating variable. In this research, we created an instrument by modifying items from multiple existing instruments on the past research in order to collect data regarding the students perceived learning outcomes and satisfaction from undergraduate students. Undergraduate students who are attending online classes are being surveyed about their experiences, perceived learning and satisfaction in online courses. The responses to the items were measured on a 5-point Likert scale ranging from 1 to 5, with 1 being "strongly disagree" and 5 being "strongly agree," and the data was analyzed using the SmartPLS and SPSS through a variety of statistical tests conducted.

Given that the majority of respondents were undergraduates, the majority of respondents were between the ages of 19 and 21. In the demographic study, the 'gender' component revealed that there are more female respondents than male respondents, and the majority of respondents had sufficient online learning experience. According to previous study, each component has a significant effect on how students evaluate their learning outcome. Students' perceptions of learning had a positive effect on their satisfaction with online classes during the epidemic, according to previous study. Despite this, there are various advantages and downsides to online learning, particularly in the twenty-first century, when there are numerous simple ways to make tough tasks simple. How students perceive their learning
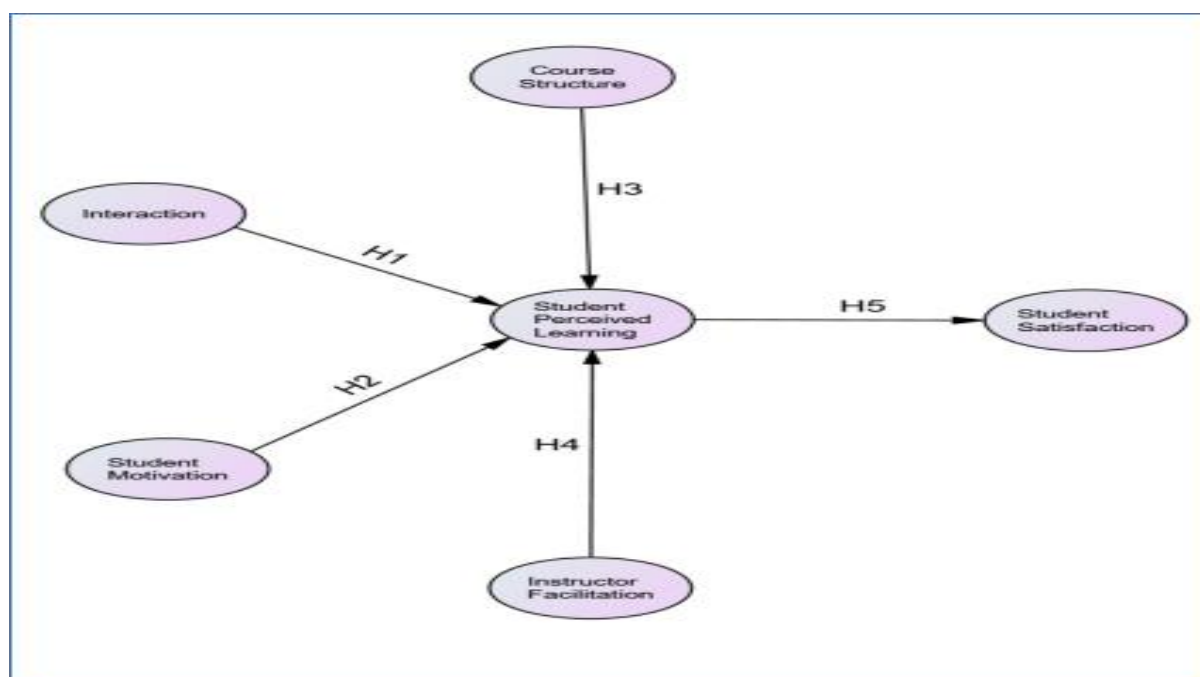
outcomes during the Covid-19 pandemic has a significant impact on their satisfaction with online courses.

Figure 1: Research Framework

Findings And Discussion

Findings are the information that we get or the conclusions that come to as the result of an investigation or some research from the survey. Based on the demographic information in Table 1, it can be inferred that 32.9% of the respondents were males while 67.1% were females. This shows that the majority of the respondents come from female respondents. Among the total respondents, 83.2% of students are from age 19 - 21 and the rest of 16.8% of students are from age 22 - 25. Besides, around 73.3% of respondents have enough experience as they have frequently learned in an online environment while 24.8% respondents stated that they have not much experience on online learning and only 1.9% respondents say they have none of experience in online learning.

**Table 2:** *Demographic Profiles (N=161)*

Category	Options	Frequency	Percentage	Cumulative Percent
Gender	Male	53	32.9	32.9
	Female	108	67.1	100.0
Age	19-21	134	83.2	83.2
	22-25	27	16.8	100.0
Experience of online learning	Enough	118	73.3	73.3
	Not much	40	24.8	98.1
	None	3	1.9	100.0

According to Table 2.1, it shows that the highest respondents from both ages 19 to 21 and 22 to 25 are both female respondents with a total of 108 respondents which equal 67.1% while male respondents with only 53 respondents where it is equal to 32.9%. According to Table 2.2, the female students have all the highest respondents for the experience in online learning. The highest for enough experience in online learning comes from female respondents with a total of 51.6% while male respondents with only 21.7%. Besides, 13.7% of female respondents stated they have not much experience in online learning while for male it have only 11.2% of the respondents. With no experience in online learning, female respondents have a total of 1.9% while male respondents with 0.0%. Our survey obtained 161 responses from 161 undergraduate students who are currently participating in online classes due to the pandemic situation. Based on the responses, 53 respondents or 32.9% are male, and 108 respondents, or 67.1% are female. As for the respondents' age, 134 of the respondents, or 83.2% are aged 19 to 21-year-old and 27 respondents, or 16.8% are aged 22 to 25-year-old. 73.3% of the respondents, specifically 118 respondents have enough experience of online learning, 24.8% or 40 respondents has not much experience of online learning, and 1.9% or 3 respondents have no experience of online learning. All of the responses were analysed by using SPSS and SmartPLS applications to observe the relationship between all variables.

Table 3: *Gender * Age Crosstabulation*

Gender * Age Crosstabulation					
			Age 19 to 21	22 to 25	Total
	Male	Count	43	10	53
		% of Total	26.7%	6.2%	32.9%
Gender		Count	91	17	108
	Female	% of Total	56.5%	10.6%	67.1%
Total		Count	134	27	161
		% of Total	83.2%	16.8%	100.0%

Gender * Age Crosstabulation
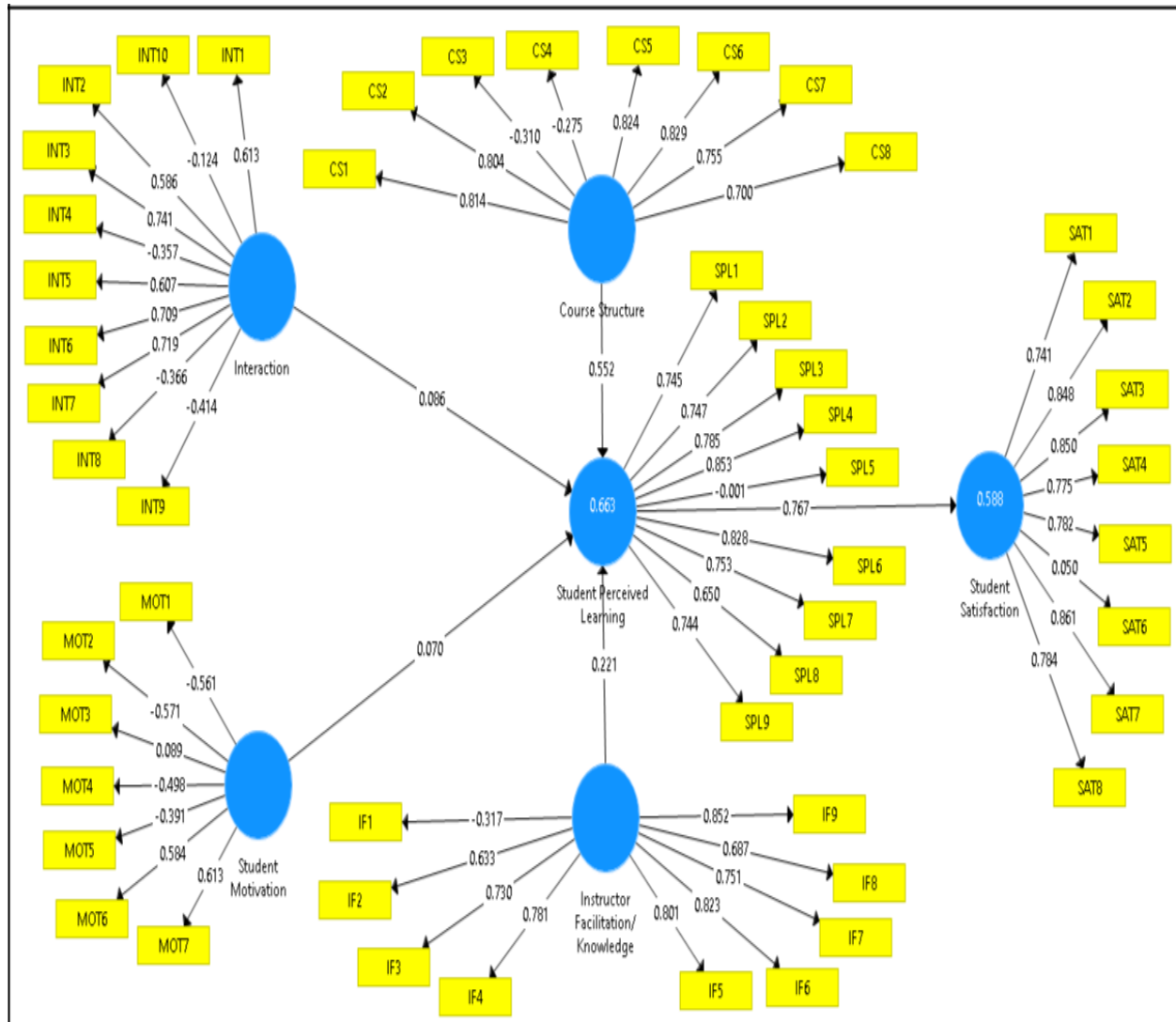
Figure 2: Hypothesised Model

**Table 4: Gender * *Experience Crosstabulation*

			Experience			Total
			Enough	Not Much	None	
Gender	Male	Count	35	18	0	53
		% of Total	21.7%	11.2%	0.0%	32.9%
	Female	Count	83	22	3	108
		% of Total	51.6%	13.7%	1.9%	67.1%
	Total	Count	118	40	3	161
		% of Total	73.3%	24.8%	1.9%	100.0%

**Gender * *Experience Crosstabulation*

Structural Model Analysis

Structural model analysis is a multivariate statistical analysis technique used to examine relationship strength. This technique combines factor analysis and multiple regression analysis to examine the structural relations between items and measured variables. Figure 2 shows the hypothesis model of the original model and item. This is the first result of the data from the calculation of the SmartPLS based on the literature. In the Generated Model, the factor loading of each item that has value of less than 0.5 needs to be taken out from the model of framework and be deleted as it is a non-valid item. The factor loading for each of the items has to be more than 0.5. Factor loading is between each of the items and variables.
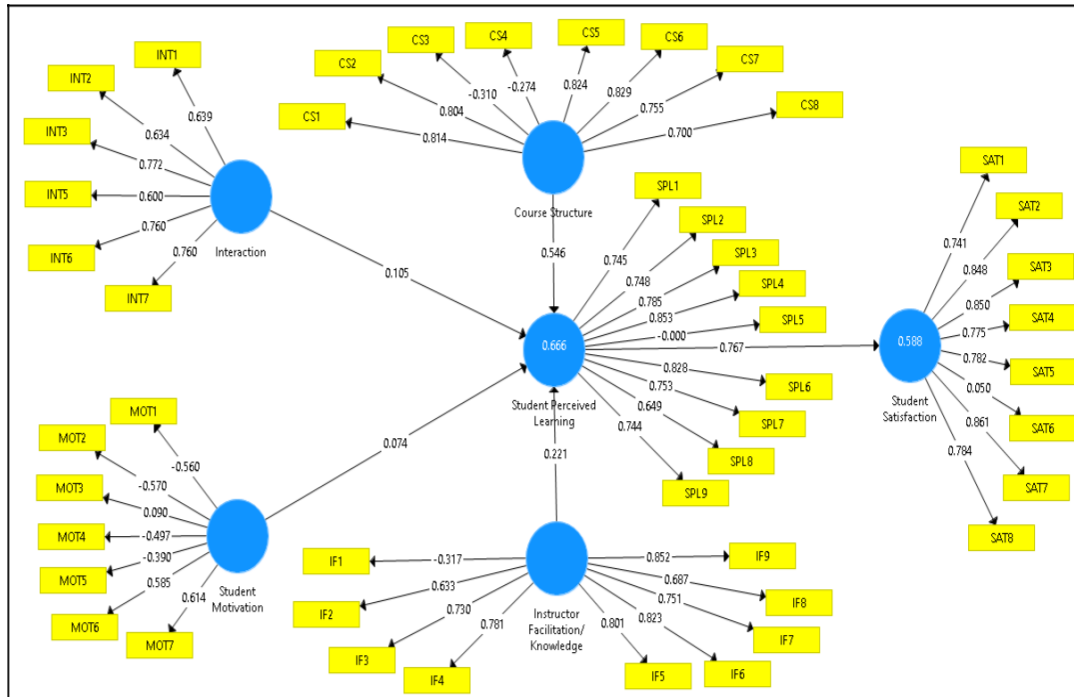
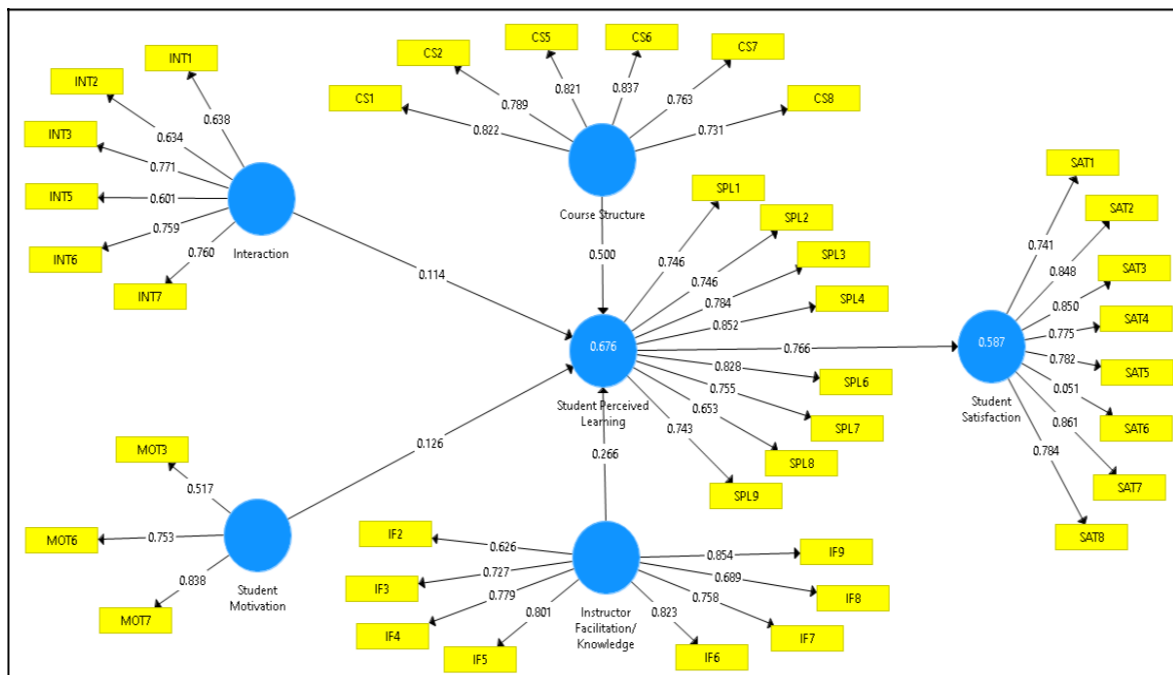**Figure 3:** Generated Model for Variable Interaction
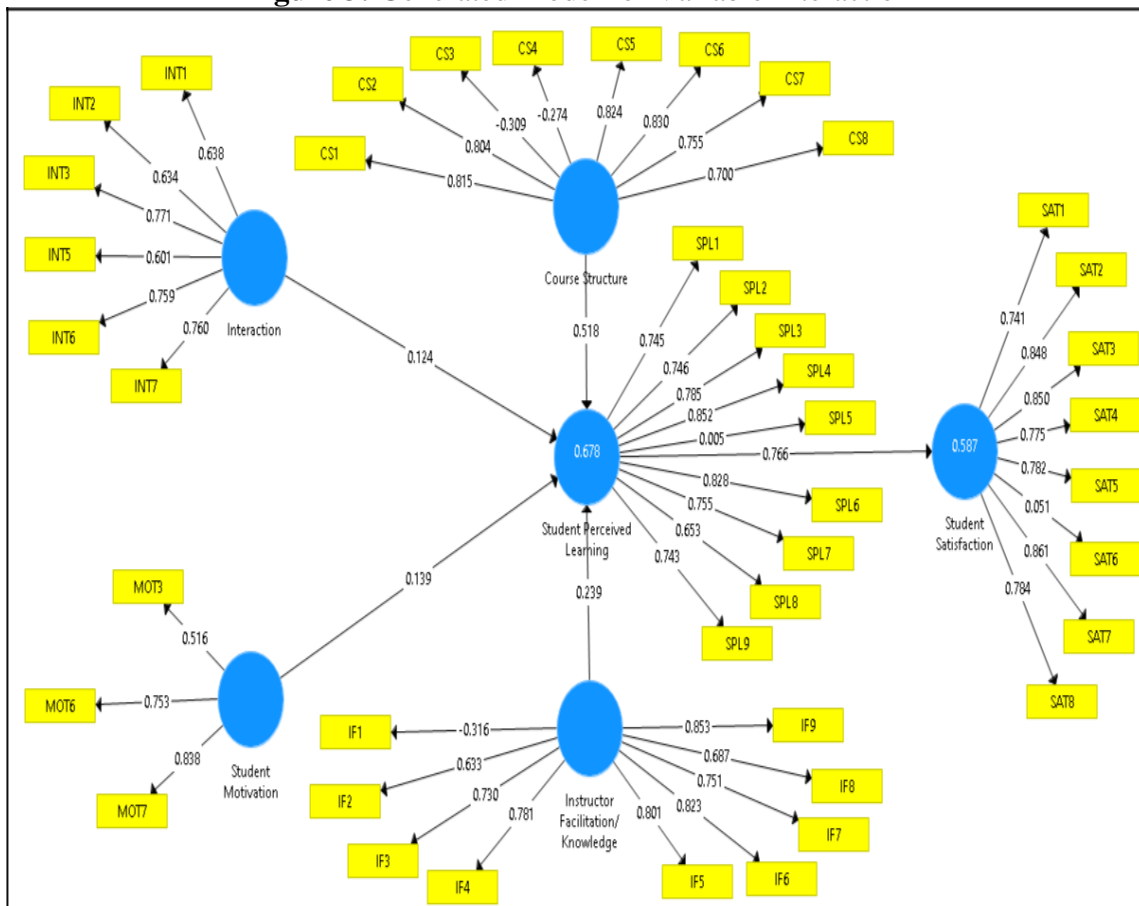
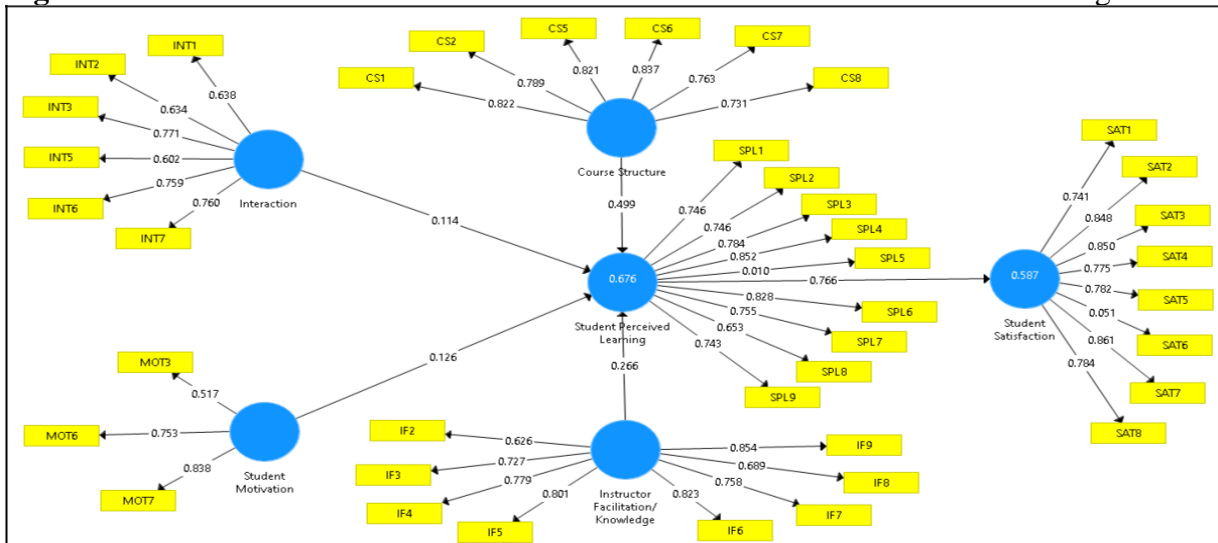**Figure 4:** Generated Model for Variable Student Motivation

The first variable that has an item of less than 0.5 is Interaction. In the interaction 4, it has a value of -0.357 and the question is "There were no opportunities for active learning in this course". Next, interaction 8 has a value of -0.366 with a question of "There is a lack of teacher-student interaction in online classes". Besides, interaction 9 also is a non-valid item as the item a have a value of -0.414 with the question "It is difficult to control group interaction during

online classes" and lastly interaction 10 is the last of item from variable interaction has a non-valid item with a value of -0.124 with a question "Teacher- students disconnect is felt low in online classes compared to classroom method". All of the non-valid items for the variable in interaction have to be deleted from the data analysis.

The second variable that has an item of less than 0.5 is Student Motivation. Out of the seven items, four of the items from this variable is non-valid items as the value is less than 0.5. Student motivation 1 has a value of -0.561 with the question "I do not feel motivated to participate in online class discussions" while student motivation 2 has a value of -0.571 with the question "I feel lack of motivation to take online classes". Next, student motivation 4 has a value of -0.498 with a question "I am finding it difficult to adapt to the online teaching mode." and student motivation 5 with value of -0.391 with question "I feel lazy and disinterested during online classes".


**Figure 5:** Generated Model for Variables Course Structure and Facilitation/Knowledge

Figure 6: Generated Model for Variables Student Perceived Learning and Student Satisfaction

The third variable that has factor loading less than 0.5 is Course Structure with two items that is non-valid. Course structure 3 has a value of -0.310 with a question of "The layout of the course was disorganized" and the second item comes from course structure 4 with a value of -0.275 with a question "Course navigation was illogical". The fourth variable comes from Instructor Facilitation or Knowledge. In this variable it has only one item that is non-valid which comes from instructor facilitation or knowledge1 with a question of "The instructor's feedback on assignments was not constructive".
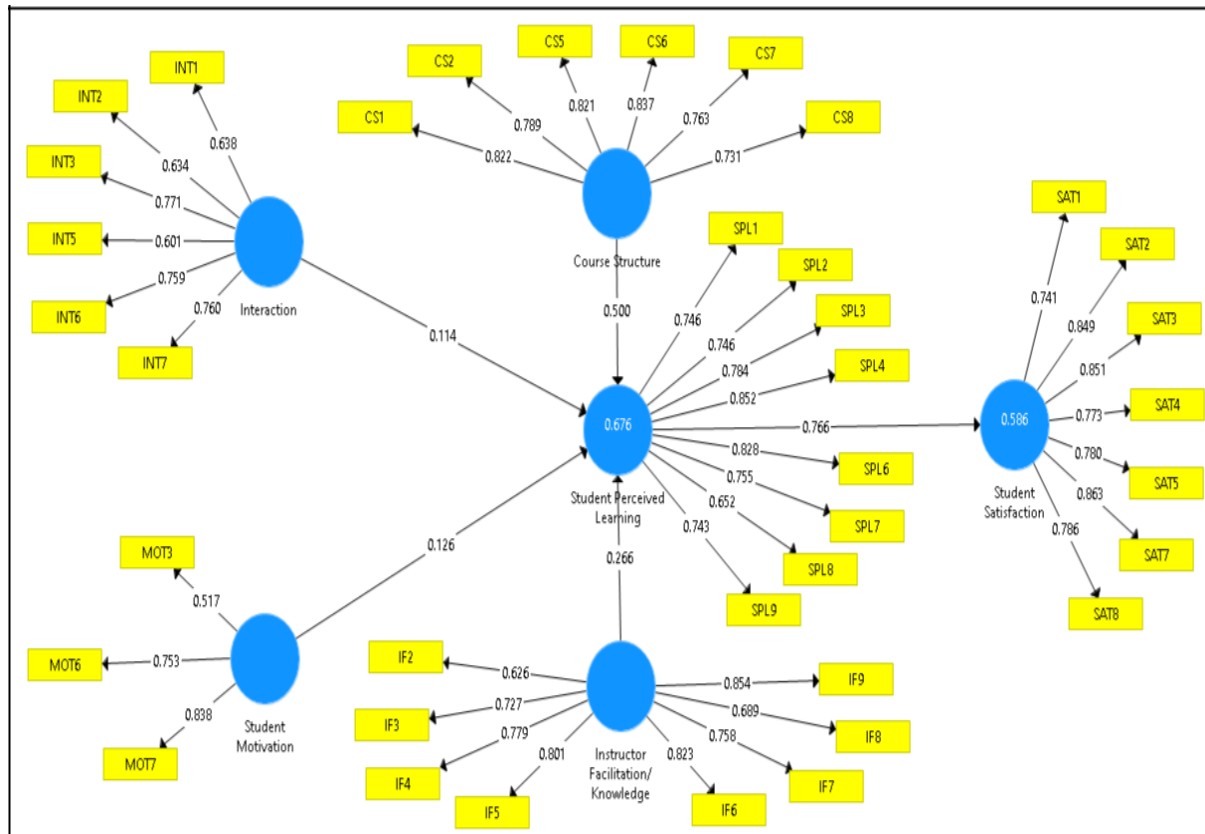
Figure 7: Re-specified Model

The next variable comes from Student Perceived Learning and Student Satisfaction with each of them has one non-valid item. Student Perceived Learning 5 has a value of -0.001 with a question of "I learned less in the course than I anticipated" while for student satisfaction 6 has a value of 0.050 with a question "There is lack of work satisfaction while taking online classes". Re-specified model is more than one time of generated model. Re-specified Model is after eliminating all of the items that are less than 0.5 from the framework. Based on figure 7, we can identify the highest student perceived learning based on the path coefficient. The higher path coefficient, the better it is. In this figure 7, it shows that Course Structure has the highest path coefficient with a value of 0.500 followed by Instructor Facilitation or Knowledge with a value of 0.266. Then, Student Motivation has a path coefficient with a value of 0.126 and last is Interaction with a value of 0.114. All of the variables have a positive influence for the path coefficient as the value between variable to variable is positive values and does not have a negative value. In Figure 7 also, it shows the r square variable of Student Perceived Learning and Student Satisfaction. For Student Perceived Learning, the value of r square is 67.6% where in this model of framework, it is able to explain the student perceived learning of 67.6% out of 100% of the phenomena of student perceived learning while for student satisfaction the value of r square is 58.6%. This model of framework is able to explain the student satisfaction of 58.6% out of 100% of the phenomena of student satisfaction.
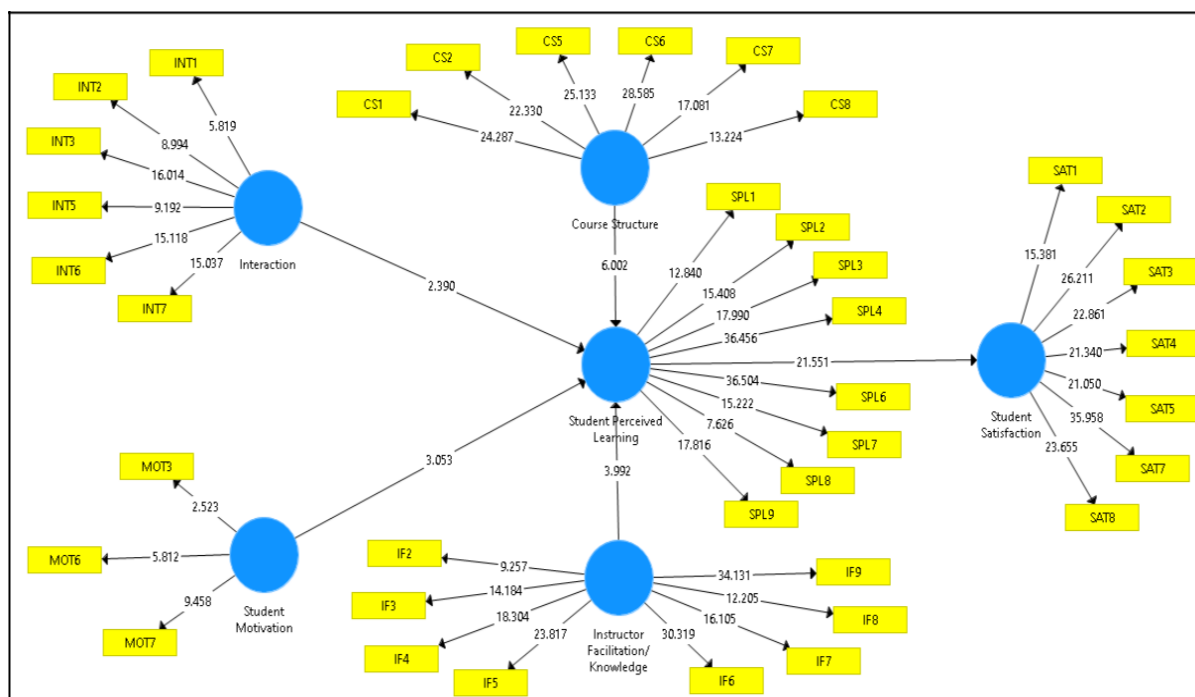
Figure 8: Bootstrapping Model

For the Bootstrapping Model, the value of factor loading; item to variable and path coefficient; variable to variable have to be more than 1.96. Based on figure 8, it shows that all of the factor loading, and path coefficients have a value more than 1.96 and this has been confirmed that all of the item and path coefficients are significant.

Results of Hypothesis Testing

t shows in Table 4 that all of the results of the regression for the hypothesis are accepted. The higher the path coefficient in the Re-specified Model, the better it is. There is a strong influence for course structure together with instructor facilitation or knowledge on the student's perceived learning outcome. While for interaction and student motivation, it has a moderate influence on student perceived learning outcome. The student perceived learning also positively affects student satisfaction in online classes during the pandemic of COVID-19. All of the variables have a t-value more than 1.96 for the factor loading and path coefficient in the Bootstrapping Model. The item and variables that obtain more than 1.96 are confirmed as significant. It indicates that due to COVID-19, all of the variables have significant effects on education.

Table 5: Hypothesis Results

Hypothesis	Independent Variables	Dependent Variables	Path Coefficient (Re- Specified Model)	Path Coefficient (Bootstrappin g Model)	Remarks
H1	Interaction	Student Perceived Learning Outcome	0.114	2.285	**Accepted**
H2	Student Motivation	Student Perceived Learning Outcome	0.126	2.926	**Accepted**
H3	Course Structure	Student Perceived Learning Outcome	0.500	5.940	**Accepted**
H4	Instructor Facilitation/ Knowledge	Student Perceived Learning Outcome	0.266	4.127	**Accepted**
H5	Student Perceived Learning Outcome	Student Satisfaction	0.766	21.596	**Accepted**

Discussion

Based on the hypothesis testing on the hypothesised model, a few items are taken out as they are invalid to the variables. Then, the structural model is generated until it becomes a re-specified model. In order to produce the re-specified model, all factor loading (outer model) that is less than 0.5 is eliminated as it gives low influence to the variable we are observing. Therefore, at this stage, we managed to identify the items that are valid and are not valid in our research. For our first variable which is interaction, only six items out of ten are valid. The valid items mostly discuss the frequent interaction of students in the course, regular communication with the instructor, promotion of interaction during learning activities, the opportunity for self-introduction in class, communication with other students within the course, and receiving ongoing feedback from classmates. Meanwhile, items such as no active learning opportunities, lack of interaction, difficulty to control group interaction, and discussion are felt low in online classes are invalid items, producing factor loading less than 0.5. Next, our second variable, student motivation has only three valid items out of seven. Not feeling motivated, lack of motivation, difficulties to adapt, and feeling lazy during online classes are the nonvalid items for this variable. On the other hand, the valid items are being easily distracted, producing perfect assignments, and working hard to get good grades even when the class is not liked are the valid items to measure this variable.

For course structure, only two of the items are not valid to measure this variable which is disorganized course layout and illogical course navigation. Other items such as aligned learning outcomes and activities, clear course purpose, clear instruction of student participation, well-organized modules, the effective range of course materials, and interesting course materials are valid measurements for the variable course structure. Next, one out of nine items under the instructor facilitation variable is eliminated as it is an invalid item to be used to measure the variable. The item eliminated is non-constructive feedback on assignments from instructors. Other items such as instructor feedback and supervision, students get to learn from feedback, instructor facilitation, responsiveness, and interaction with students are all considered valid items to measure the variable as all of them have factor loading that is greater than 0.5.

For the next variable, which is student perceived learning, eight items are valid meanwhile one is not. Promotion of achievement of student learning outcomes, pleased learning, useful skills for future, enhanced understanding, contribution to professional development, exploration of innovative teaching methods, the consciousness of learning skills, and well-learned presented class materials are the valid items for measuring this variable. Meanwhile, the invalid item that has factor loading less than 0.5 is learning less than what is anticipated from the course. The last variable is student satisfaction. One out of eight items is invalid, leaving another seven items as valid measurements for the variable. The invalid item is lack of work satisfaction while taking online classes. On the other hand, the valid items consist of satisfaction in the level of student interaction, the satisfaction of online classes, satisfying online classes experience, satisfaction with the instructor and content, satisfying overall online learning experience, and the online course met my needs as a learner.

After eliminating the invalid items, once again, the PLS Algorithm is run on the structural model, producing the re-specified structural model. At this stage, the re-specified model went through the bootstrapping and produced the bootstrapping model. The T-value of the pathway is observed to be more than 1.96 for the path coefficient to be significant. In our research, our bootstrapping model shows that all path coefficients (inner model) and factor

loadings (outer model) are significant to each other as the T-value is greater than 1.96 (p < 0.05). We find that interaction (T-value = 2.285), student motivation (T-value = 2.926), course structure (T-value 5.940), and instructor facilitation (T-value = 4.127) have significant positive relation with student perceived learning (p < 0.05) and student perceived learning (T-value =21.596) have significant positive relation with student satisfaction (p < 0.05).

Findings related to the relationship between the variable interaction and student perceived learning, hypothesis H1, show a significant relationship in this case. Loneliness might hinder the students' learning process (Sit et al., 2005 as cited in Kaufmann &Vallade, 2020). Students' interaction such as initiating communication between students and lecturers, participating in activities that promote interaction, and receiving feedback from classmates influences student perceived learning which will then influence student satisfaction. According to Kaufmann and Vallade (2020), this element, among other factors, becomes critical in the development and delivery of high-quality online courses. Also, researchers and instructors may use moment-to-moment interactions to identify learning opportunities as mentioned in Smit et al. (2021).

Findings related to the relationship between the variable student motivation and student perceived learning, hypothesis H2, show a positive relationship. This finding counters the finding by Bulić and Blažević (2020) in the past research where they both recommended an inverse relationship between student motivation and online teaching. According to Brandmiller, Dumont, and Becker (2020), teacher expectations of students' achievement have a close relationship with student motivation. It means that students with higher motivation will be able to see the importance of learning thus motivating them to achieve greater results. In our research, we find out that being easily distracted during class, turning in perfect assignments, and working hard to earn good grades even though not liking the class, plays a role in student motivation, which will then influence student perceived learning.

Findings related to hypothesis H3 which is the relationship between course structure and student perceived learning shows the highest significant relation between the variables. This means that among four of the independent variables that influence student perceived learning, these variable influences student perceived learning the most. Items such as aligned learning outcomes and activities, clear course purpose, clear instruction of student participation, well-organized modules, the effective range of course materials, and interesting course materials are seen to be influencing the variable course structure which will then influence student perceived learning. Findings from previous research conducted by Heilporn et al. (2020), also found that having well-structured and well-paced blended-learning courses proved to be crucial for student participation. Student's behavioral and emotional participation was boosted by explicitly explaining how the blended-learning course was structured and students' anxiety and negative emotional responses were decreased by clear contact at the start of the class, and their interest in events was increased.

Findings related to hypothesis H4 which is the relationship between instructor facilitation or knowledge and student perceived learning shows a positive relationship between the variables. There is also a relatively good positive relationship between teaching presence and perceived learning in research conducted in 2020 by Caskurlu et al. In our research, items such as instructor feedback and supervision, students get to learn from feedback, instructor facilitation, responsiveness, and interaction with students are all influencing the variable instructor facilitation. Feedback allows students to have a deeper view of the learning goals and, as a result, manage their goals as mentioned in Chan and Ko (2020).

The last findings are related to hypothesis H5 which is the relationship between the mediating variable, student perceived learning, and the dependent variable, student satisfaction. The relation between the two variables is a significant relationship and it proves that student perceived learning does influence student satisfaction. The variable student perceived learning is influenced by other independent variables. However, the variable student perceived learning itself also has its own set of items which are the promotion of achievement of student learning outcomes, pleased learning, useful skills for future, enhanced understanding, contribution to professional development, exploration of innovative teaching methods, the consciousness of learning skills, and well-learned presented class materials. All of these items influence the variable student perceived learning, which is also influenced by four other independent variables, affecting the outcome of the dependent variable which is student satisfaction. According to Chan and Ko (2020), enabling them to make more informed decisions will increase their learning satisfaction.

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First, this research would benefit the teachers by allowing them to identify the factors influencing students' satisfaction during online learning. Using a quantitative approach, this research looked at the variables that influence the students' perceived learning and students' satisfaction in an online learning environment. Teachers will benefit from this research as it will help them to visualize the relation of one factor to the other and how it will affect the students' perceived learning as well as students' satisfaction. In other words, they are provided with a greater sense of the student's point of view. Therefore, this research allows the educators to revise their study plan to increase their students' satisfaction and student's perceived learning. This will aid them to improve the quality of learning in an online environment.

Second, the findings of this study reveal that instructor knowledge or facilitation and course structure are important factors affecting the student perceived learning and student perceived learning does influence student satisfaction. Therefore, after knowing these facts, educators who want to increase their students' satisfaction will now know the first approach they have to take which is to increase the student's perceived learning. This is because student satisfaction is affected by student perceived learning and to elevate the engagement on student perceived learning, one must focus on the two most important factors which are course structure and instructor facilitation or knowledge. A well-structured course will definitely help students to keep track of their learnings. It might also be easier for them to understand the course as a well-structured course will take a step-by-step approach. On the other hand, instructor facilitation or knowledge will definitely increase student perceived learning as they will receive proper guidance. Thus, student satisfaction can be elevated through this method.

Conclusion And Recommendations

The outcomes and findings of our study contribute to two types of implications, namely practical and theoretical. On a practical level, a number of significant recommendations for students and instructors can be presented in order for them to effectively enhance the quality of the online teaching process. The study provides useful insights into how Indonesia's higher education system's instructional process evolved amid a period of sudden and frequent changes. Consequently, it is likely that after a longer period of adaptation and familiarisation of students and teachers with the online environment, the quality of the educational process will increase, and students' perceptions of online learning will be more positive and consistent with the findings of other studies cited in this paper. However, in order for the Indonesian education system to adapt to online teaching and learning appropriately and successfully, a series of steps must be taken to encourage and promote its transition to this new method of instruction. In this context, colleges could design teacher training sessions or programmes with the objective of enhancing teacher performance and, by extension, the quality of the educational process.

Students' perceptions of learning were influenced by a number of psychosocial factors, including online class participation and online learning, according to the findings of this study. Two elements affect online class engagement: interaction and student motivation. Two factors affect online learning: course structure, instructor facilitation or knowledge, and structural factors such as student satisfaction. Based on the findings, we know that online learning presents numerous obstacles for pupils. It is not simple for students to comprehend learning. First, interaction and motivational retention. Given that students may not attend class at a defined time on a physical campus, it may be difficult to find the motivation to begin school. Some students may find it difficult to view their home as a study space but designating particular areas of the home for work can help them complete their assignments. Maintaining contact with peers and, when appropriate, reaching out to instructors or academic staff can be encouraging.

The greater the students' engagement with distant education, the greater its prominence in their thinking. Daily login is required to view course updates and class discussions. Connect with other students and offer own questions or ideas. Second, certain students are falling behind. In the classroom, the instructor or lecturer must monitor the students and adjust their pace to accommodate those who require additional time. This is more challenging in a virtual classroom. As it is more difficult to interpret body language digitally, students may choose to remain mute or "put on a brave face," leaving the class feeling unhappy, disillusioned, and having gained no knowledge. Therefore, based on the survey responses, we may evaluate a student's level of engagement in their online course. Third, deteriorating social aspects Last but not least on our list of disadvantages of online education is the absence of key social factors. There are several opportunities for social interaction with peers within the structures of the majority of degree programmes. This can be attained through classroom activities or "social lounges" established outside the digital classroom. All of these are positive, but they cannot replace in-person connections. Interacting in person fosters deeper relationships, a sense of camaraderie based on shared work and goals, and a range of other positive traits in students. These are simply a handful of the obstacles that students may encounter when engaging in digital learning. As a result of the rapid move to online classrooms, students are anxious about their academic futures. It's natural to be concerned about the education system in future throughout this time, but it's essential to remember that all business stakeholders is not alone. COVID-19 has irrevocably changed the universe. Despite the fact that this crisis has had a substantial influence on university students, adaptability is an essential life skill.

Due to the fact that the majority of educational institutions in Indonesia provide their courses through face-to-face learning, these institutions must make efforts to conduct a portion of their teaching and learning activities via fully online learning or web-assisted learning. Due to the current COVID-19 dilemma, the majority of educational systems have been compelled to seek alternatives to online education. To allow instruction to continue during school closures, many universities have shifted their operations online. Given the alternative of no face-to-face instruction, online learning has shown to be a beneficial tool for skill maintenance during institution closures (Sentosa, Shamsudin & Sharin, 2021). Concerns exist, however, that online learning may have been a suboptimal replacement for face-to-face instruction, particularly in the absence of universal access to infrastructure (hardware and software) and a lack of proper preparation among teachers and students for the unique demands that online teaching and learning pose. Based on the data, there are few recommendations for influencing the perceived learning outcome and student satisfaction in online learning during the Pandemic Covid-19. The institution must first aid students in creating positive feelings and attitudes toward themselves. Developing a positive attitude about learning can aid students in overcoming some of the challenges presented by online learning, such as maintaining focus and motivation throughout online classes.

Supporting students in the effective use of information and communication technology (ICT) and making the most of emerging technologies for learning is also crucial. Positive attitudes toward learning, self-regulation, and intrinsic motivation to study all play a vital role in improving school achievement in general, but if online learning continues, they may become even more crucial. The attitudes and dispositions of pupils are also highly influenced by the support they receive from their families and teachers, as well as the exposure they have to role models. Different types of support from families and lecturers, such as parental emotional support and instructor enthusiasm, have been shown to be important for the development of positive learning attitudes and can ensure that students acquire attitudes and dispositions that maximise their ability to take advantage of online learning opportunities (Brandmiller, Dumont Becker, 2020). However, some families and teachers may find it challenging to provide such help, especially during the COVID-19 crisis, due to a lack of time, insufficient digital skills, or the absence of curricular requirements. Last but not least, education institutions or the government should attempt to provide parents with more information and assistance on how to support their children's learning by enhancing engagement between universities and parents. Simultaneously, instructors need aid integrating technology into their teaching techniques and strategies, as well as assisting students in overcoming some of the problems associated with this type of learning environment. Supporting teachers' training in the use of digital resources for pedagogical practise and teaching methodologies customised to this context are crucial for ensuring that ICT is utilised effectively.

This study demonstrates students with valuable information regarding the educational process in Surakarta, Indonesia's higher education institutions during the epidemic, data that may be used to improve the online teaching-learning process. However, the analysis has certain drawbacks. The study was non-probabilistic, and the analysis was restricted to a small number of Indonesian universities in the Surakarta district. As a result, the conclusions cannot be extended to the entire higher education industry in Indonesia. In addition, only a few colleges had expertise with the E-learning platform prior to the Corona-virus outbreak, but only the most fundamental technologies were utilised. It would be useful to expand the sample to include other universities in Indonesia in order to generalise the results and to make comparisons based on universities, fields of study, universities' prior experience with online learning, and the presence of teacher training programmes during this transition period. In

addition, a longitudinal study would be beneficial to see if institutions transitioned to online-only teaching and learning, if and how professors adapted (teaching style, student contact), and if students' attitudes about online learning changed.

Students suffer challenges and problems as a result of moving to fully online learning, as stated in this study, which highlights an agitated and panicked phenomenon for which no single study can address all of its facets in a single setting (Othman, 2022). Despite the fact that this study provided a substantial contribution through research findings and proposed a motivating model to ensure that university students have sustainable and healthy online learning, several limitations could open up numerous paths for future study. This study was first conducted on a small sample of Indonesian university students. Additional research could examine the occurrence in a broader spectrum of populations utilising other approaches, institutions, and nations. Second, current research on the impact of the COVID-19 pandemic on the learning lives of university students has been enriched in terms of causes and some negative consequences; however, more motivating frameworks must be developed in the field of higher education institutions as a response to these causes and negative consequences. Thirdly, this study's conceptual model provided three interconnected contexts: human factors, technical factors, and socio-environmental variables. In this paradigm, each of these situations remains speculative and must be measured empirically. Consequently, each backdrop in this suggested model may be empirically examined in future studies to provide more confirmation. As a novel expansion of this study, it would be intriguing to assess the impact of the COVID-19 epidemic on the creative thinking of university students and how university administration is able to determine the institution's long-term strategic orientation.

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