



# Students Engagement and Students Motivation as Predictors of Learning Satisfaction in a Synchronous Hybrid Learning Space among the TVET Students

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## Abstract

A synchronous hybrid learning space combines traditional on-site and online learning into a single learning experience to promote effective learning for both on-site and online students concurrently. It is a flexible, accessible, and engaging learning environment. There is a dearth of research on the factors that influence synchronous hybrid learner learning satisfaction as compared to traditional on-site or online learning environments. The relationship between student engagement, student motivation with student learning satisfaction in synchronous hybrid learning space was underexplored although these student learning competencies were noticeably strong predictors of student learning satisfaction in the full on-site or online settings. Hence, this study aimed to explore predictive learning competencies for student learning satisfaction in synchronous hybrid learning. A cross-sectional method was employed to collect quantitative data from 169 students of a Technical and Vocational Education and Training (TVET) institute located in Kuching, Sarawak at a given point in time. These respondents' learning competencies and learning satisfaction in synchronous hybrid learning spaces were investigated. The research findings showed that student engagement (i.e., emotional, cognitive, and behavioural) and student motivation (i.e., intrinsic goal orientation, extrinsic goal orientation, and self-efficacy) which are found predictive in traditional on-site and online learning settings can be applied in synchronous hybrid learning space as well. The results of this study were intended to guide practices and policies related to the design and implementation of synchronous hybrid learning to add value and further substantiate the potential of this learning space.

**Keywords:** Student Engagement, Student Motivation, Student Learning Satisfaction, Synchronous Hybrid Learning Space

*Received October 28, 2022    Revised November 22, 2022    Published April 30, 2023*



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## Introduction

The landscape of education is shifting as the COVID-19 pandemic has spurred numerous revisions in the education system globally, including in Malaysia. To ensure the continuation of education during the pandemic, Malaysian educational institutions must adopt a new paradigm that requires traditional in-person teaching and learning to undergo rapid digital transformation, leading to the implementation of more versatile learning choices such as synchronous hybrid learning. The shift to synchronous hybrid learning has demonstrated several advantages, including accessibility and flexibility in terms of time, place, pace, learning style, material, and assessment, as well as having a positive impact on student

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learning experiences (Eliveria, Serami, Famorca, & Cruz, 2019; Raes, 2021; Romero-Hall & Vicentini, 2017; Walker, Lang, Alperin, Vu, Barry & Gaydos, 2020; Wilson, 2008), and thus could be used as a new learning approach post-pandemic. In 2022, The Ministry of Education (MOE) Malaysia is accelerating 'The Hybrid Classrooms Pioneer Project', the digitalisation and information and communication technology (ICT) in the public education system in Malaysia (Povera, 2022). To encourage innovative learning, 550 classrooms in 110 schools nationwide will be converted to hybrid classes by November 2022 (Povera, 2022). However, existing literature suggests that research into synchronous hybrid learning is still in its infancy (Raes, 2021), and the relationship between student engagement, student motivation with student learning satisfaction in synchronous hybrid learning space was underexplored by previous studies although these student learning competencies were noticeably strong predictors of student learning satisfaction in the offline and fully online learning space (Rajabalee & Santally, 2020). To capitalise on the change initiated by COVID-19, this study sought to analyse student engagement considering various dimensions adapted from the Student Engagement Scale (SES) developed by Doğan (2014); student motivation adapted from the Motivated Strategies for Learning Questionnaire (MSLQ) Manual developed by Pintrich, Smith, Garcia, and Mckeachie (1993); and student learning satisfaction adapted from the Hexagonal E-Learning Assessment Model (HELAM) proposed by Ozkan and Koseler (2009). A quantitative study was conducted to examine the engagement and motivation competencies of 169 students at a Technical and Vocational Education and Training (TVET) institute located in Kuching, Sarawak, their satisfaction with synchronous hybrid learning was measured to address the research questions as follows:

RQ1: How does student engagement influence student learning satisfaction in a synchronous hybrid learning space?

RQ<sub>1(a)</sub>: How does emotional engagement influence student learning satisfaction in a synchronous hybrid learning space?

RQ<sub>1(b)</sub>: How does cognitive engagement influence student learning satisfaction in a synchronous hybrid learning space?

RQ<sub>1(c)</sub>: How does behavioural engagement influence student learning satisfaction in a synchronous hybrid learning space?

RQ2: How does student motivation influence student learning satisfaction in a synchronous hybrid learning space?

RQ<sub>2(a)</sub>: How does intrinsic motivation influence student learning satisfaction in a synchronous hybrid learning space?

RQ<sub>2(b)</sub>: How does extrinsic motivation influence student learning satisfaction in a synchronous hybrid learning space?

RQ<sub>2(c)</sub>: How does self-efficacy influence student learning satisfaction in a synchronous hybrid learning space?

From the research questions identified, the following is a list of null hypotheses of this study:

Ho1: There is no significant influence of student engagement on student learning satisfaction in a synchronous hybrid learning space.

Ho<sub>1(a)</sub>: There is no significant influence of emotional engagement on student learning satisfaction in a synchronous hybrid learning space.

Ho<sub>1(b)</sub>: There is no significant influence of cognitive engagement on student learning satisfaction in a synchronous hybrid learning space.

Ho<sub>1(c)</sub>: There is no significant influence of behavioural engagement on student learning satisfaction in a synchronous hybrid learning space.

Ho2: There is no significant influence of student motivation on student learning satisfaction in a synchronous hybrid learning space.

Ho<sub>2(a)</sub>: There is no significant influence of intrinsic motivation on student learning satisfaction in a synchronous hybrid learning space.

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Ho<sub>2(b)</sub>: There is no significant influence of extrinsic motivation on student learning satisfaction in a synchronous hybrid learning space.

Ho<sub>2(c)</sub>: There is no significant influence of self-efficacy on student learning satisfaction in a synchronous hybrid learning space.

## Literature Review

### *Synchronous Hybrid Learning Concept*

One of the most anticipated post-pandemic concepts is hybridization: a hybrid workplace and hybrid learning. Since the COVID-19 pandemic, the hybrid learning approach has become a popular subject in the education field globally, including in developing countries such as Malaysia. Hybrid learning can be defined as an extensive strategy that blends the best elements of offline and online learning by rotating physical learning sessions and online learning via learning management systems (LMSs) where students can interact with content asynchronously to provide students with the optimum learning experience (Wang, Quek, & Hu, 2017). The term synchronous was later added to denote the hybrid learning space with both in-person and online students simultaneously, in which both online and classroom-based instruction is provided in a course synchronously via computer-mediated technologies such as video conferencing tools, this learning method is called synchronous hybrid learning (Raes, Detienne, Windey & Depaepe, 2019; Raes, 2021; Wang et al., 2017).

A systematic review of existing research on the knowledge of synchronous hybrid learning was published by Raes et al. (2019) which included 47 studies from the year 2003 to 2017 found that synchronous hybrid learning offers organisational benefits such as, increasing recruitment promoting a multifaceted student population, and promoting student retention. From the perspective of students, the benefits of synchronous hybrid learning are such as, increase collaboration and connection amongst online students, offline students, and lecturers; a better sense of control over learning; flexibility in course attendance; and enhanced exposure to technical skills that can prepare students for careers in technology-rich society (Raes et al., 2019). Likewise, Wang et al. (2017) stated that the advantages of synchronous hybrid learning spaces include increasing affordability due to advancements in computer-mediated communication technologies; a flexible learning approach to ensure the continuity of education during unprecedented times; establishing rich teaching presence, social presence, and cognitive presence; and economic benefits such as lowering educational institute costs and students' commute costs. In addition, other research focusing on online learners in synchronous hybrid learning found that synchronous hybrid instructions improve the study habits of remote learners, accessibility of material and integration of educational technology tools help enhance online students' learning experience (Romero-Hall & Vicentini, 2017). Additionally, strengthened communication, support learning, the innovative, inclusive format which supports dynamic interactions, multiple perspectives and social competencies, and immediate teacher-student feedback are benefits of synchronous hybrid learning identified by Priess-Buchheit (2020). Furthermore, Angelone, Warner, and Zydney (2020) concluded in the study 'Optimizing the technological design of a blended synchronous Learning Environment' that synchronous hybrid learning has the potential to increase the simultaneous presence of offline and online students in support of a seamless student experience and improve the versatility and accessibility of course offerings if designed well. Similarly, Little and Jones (2020) discovered that students did better in synchronous hybrid classes than in entirely online or fully on-site classes because the synchronous hybrid learning environment is more engaging and flexible. Existing research backs up the purported practical, pedagogical, and logistical advantages of synchronous hybrid learning when executed properly.

However, Tomas Kepler, the chairman of the Danish upper secondary school union, debated that synchronous hybrid learning is a huge load for teachers and an impossible task to accomplish, Kepler concluded that hybrid learning is unachievable and will degrade educational quality. (Kepler, 2020). Furthermore, previous studies have also identified the

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challenges that influence the effectiveness of hybrid learning are technological, and pedagogical in nature and one pedagogical challenge is the in-person and online students' experience in a hybrid synchronous situation (Priess-Buchheit, 2020; Raes, 2021; Romero-Hall & Vicentini, 2017; Wang et al., 2017). For example, reviews of the Global Classroom hybrid model employing video conferencing indicated that students are satisfied with the flexibility this model offers, but that hurdles in the technical issues of the classes frustrate and disengage remote students (Weitze & Ørngreen, 2014). Similarly, another synchronous hybrid approach using video conferencing reveals that remote students feel a sense of distance from their teacher and in-person classmates because they are unable to participate in classroom discussions or receive feedback from their teacher and peers (Ramsey, Evans, & Levy, 2016).

Even though previous studies investigating predictors of student learning satisfaction in traditional and e-learning settings found student engagement and student motivation are predictive in general, study to investigate the relationship between student engagement, student motivation and student learning satisfaction in a synchronous hybrid setting when in-person and remote students are present simultaneously is scant. (Raes et al., 2019; She, Ma, Jan, Nia, & Rahmatpour, 2021; Xiao, Sun-Lin, Lin, Li, Pan & Cheng, 2020). According to Xiao et al. (2020), a study examining two hundred and eleven students at Shanghai Open University has indicated that motivation competencies found predictive to general, or e-learning student learning satisfaction is not associated with student learning satisfaction in hybrid learning spaces, only engagement competencies especially cognitive engagement can predict student learning satisfaction. However, there is a possibility the findings of the study may be biased due to the research limitation in which participants learning satisfaction only reflect fully traditional learning or fully remote learning since participants can freely choose between offline or online learning spaces based on their preferences (Xiao et al., 2020). Therefore, it would be beneficial for future studies to investigate student engagement and student motivation (Eliveria et al., 2019; Wang et al., 2017) and student learning satisfaction (She et al., 2021) in synchronous hybrid learning space, to track the extent to which student engagement and student motivation affect student learning satisfaction in a synchronous hybrid learning space to further substantiate this new educational norm which is not solely a consequence of the Covid pandemic, but the way forward for future education.

### ***The Influence of Student Engagement on Student Learning Satisfaction***

Student engagement is defined as a student's commitment to learning; interaction with course content, teachers, and peers; as well as participation in the educational environment to accomplish desired outcomes (She et al., 2021, Rajabalee & Santally, 2020; Satuti et al., 2020). According to Fredricks, Blumenfeld and Paris (2004), student engagement is multidimensional, and the significant relationship between student engagement and positive learning outcomes such as increased student learning satisfaction, academic success, retention, and completion rates has highlighted the need to comprehend the three dimensions of students' engagement: (1) emotional engagement (2) cognitive engagement and, (3) behavioural engagement. Emotional engagement encompasses students' reactions to learning and sentiments linked with academic performance; students' commitment to learning and strategic decision-making about learning is referred to as cognitive engagement; and behavioural engagement as perceptible positive or negative behaviour related to a student's attention toward learning and the learning process (Doğan, 2014).

Previous research stresses that student engagement is one of the key aspects of effective learning in all modes of education (Fisher, Perényi, & Birdthistle, 2018), and positive student engagement can boost student learning satisfaction, academic success, retention, and completion rates (Gao, Jiang, & Tang, 2020, Kim & Kim, 2021; Rajabalee & Santally, 2020). In other words, students who failed to engage in learning are more likely to experience low levels of learning satisfaction, academic regression, and increased attrition rates. Numerous studies have found that student engagement is correlated to student learning satisfaction and has significant positive effects on student learning satisfaction in both physical and online classes, and they were noticeably strong predictors of student learning satisfaction. (Chen &

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Stotlar, 2012; Obiosa, 2020; She et al., 2021). Additionally, it was found by Howson and Matos (2021) and Obiosa (2020) that student engagement predicted student learning satisfaction in traditional offline learning. Whereas Ji, Park, and Shin (2022) study to investigate the link between engagement, readiness, and satisfaction in a synchronous online second language learning environment has revealed that engagement namely emotional, cognitive, and behavioural are significant predictors of learning satisfaction at the end of the semester but not at the start, hence readiness plays an important role in synchronous online course satisfaction. In addition, the study by Trisanti, Alsolami, Kusumawati, and Primandaru (2021) found a significant influence of emotional and cognitive engagement on student learning satisfaction in online learning. However, due to the reduced interaction with teachers and peers in online learning compared to physical learning, it was discovered that student behavioural engagement had no discernible impact on students' learning satisfaction (Trisanti et al., 2021).

Pelletier, Rose, Russell, Guberman, Das, Bland, Bonner, and Renée Chambers (2016), on the other hand, discovered no significant association between student engagement and student learning satisfaction but found that expected grade was the biggest predictor of student learning satisfaction in the on-site classrooms. In a hybrid learning setting, a study by Xiao et al. (2020) found that only cognitive engagement was a noticeably strong predictor of student learning satisfaction, not behavioural and emotional engagement. The findings, according to Xiao et al. (2020), can be attributed to hybrid learning's flexible nature, which allows learners to find and explore the right blend of learning options that learners are satisfied with. As a result, the findings may be biased by the effect of self-selection of learning options, whether fully online, fully on-site, or hybrid. Therefore, future research is needed to confirm the findings of Xiao et al. (2020) who reported that cognitive engagement is the only predictor of student learning satisfaction in the hybrid learning environment.

### ***The Influence of Student Motivation on Student Learning Satisfaction***

Student motivation is one of the aspects that encourage students to acquire new skills and knowledge (Motevalli, Perveen, & Michael, 2020). Motivation can be defined as an internal process that stimulates, guides, and sustains behaviours over time (Pintrich et al., 1993), it can also mean being persistent, ambitious, goal-orientated, and self-perception oriented (Erhuvwu & Adeyemi, 2019). The level of student motivation can be measured based on the dimensions of student motivation: (1) intrinsic goal orientation, (2) extrinsic goal orientation, (3) task value, (4) control beliefs, (5) self-efficacy, and (6) test anxiety (Pintrich et al., 1993).

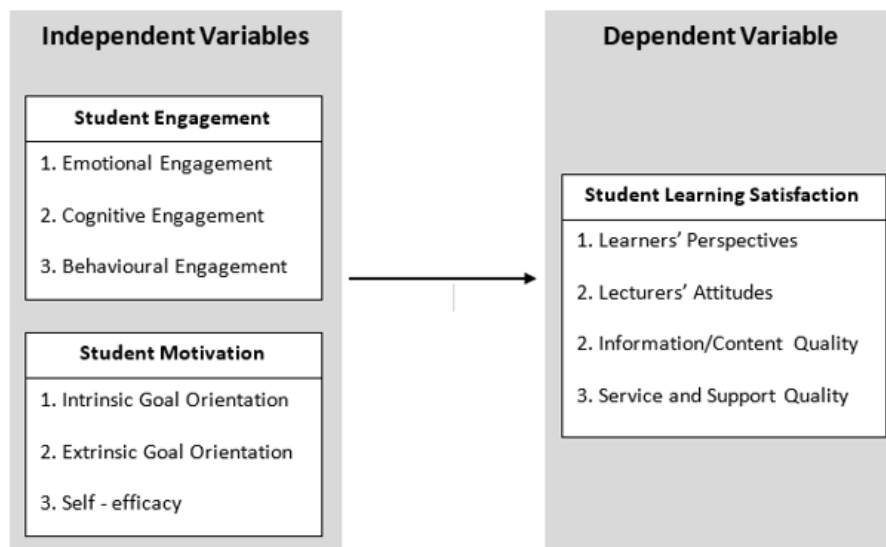
Existing studies have identified that student motivation is an important contributor to student academic achievement as well as a predictive of student learning satisfaction in general classroom learning or e-learning setting (Erhuvwu & Adeyemi, 2019; Law, Geng, & Li, 2019). In other words, being able to boost student motivation will drive students to be satisfied with learning in onsite learning or e-learning setting. According to Wang and Chui (2016), Student motivation is found to be associated with student learning satisfaction in the field education context. In addition, Obiosa's (2020) study which looked at student motivation, engagement, and learning satisfaction about on-site lecture instruction in higher education found that student motivation is a moderately good predictor of student learning satisfaction however when combined with student engagement, these learning competencies become a significantly stronger predictor of student learning satisfaction. Whereas she et al. (2021) discovered that one of the dimensions of student motivation, self-efficacy, is a predictor of student learning satisfaction in Massive Open Online Courses (MOOCs). Students with low self-efficacy for learning are more likely to be academically disengaged whereas, students with strong self-efficacy for learning are more intrinsically motivated, leading to favourable learning outcomes and a higher possibility of experiencing learning satisfaction. (She et al., 2021).

Student motivation, which has been reported to be predictive of student learning satisfaction in general learning and online learning settings in the literature, does not significantly predict student learning satisfaction in a synchronous hybrid learning space,

according to a study by Xiao et al. (2020). However, Xiao et al. (2020) study findings may be biased because of the research limitation that participants' learning satisfaction may only reflect fully on-site learning or online learning instead of hybrid learning since participants can freely choose between offline, online, or hybrid learning spaces based on their preferences.

### ***Conceptual Framework***

A conceptual framework was developed based on the literature review of existing studies to explain the primary goals for the investigation process and to present expected relationships between the main variables in this study to produce coherent results. As shown in Figure 1, the main variables of this study are student engagement and student motivation as independent variables whereas, student learning satisfaction is the dependent variable.



**Figure 1 Conceptual Framework**

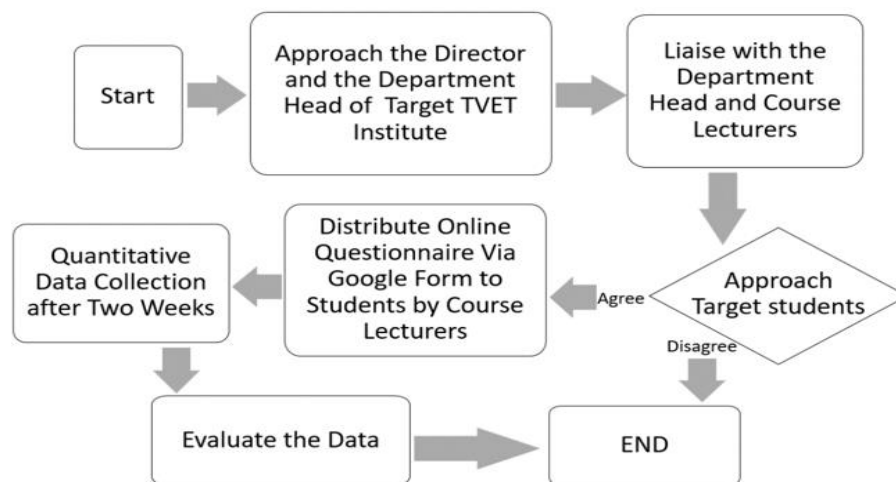
### **Method**

To determine the extent to which student engagement affects student learning satisfaction as well as the extent to which student motivation affects student learning satisfaction in synchronous hybrid learning spaces, this study employed a descriptive research design to collect quantifiable data from the population sample and statistically analyse the data collected. A cross-sectional method was employed to collect quantitative data from a sample of the 169 TVET student population at a given point in time. This study utilised the 6-point Likert scale online questionnaire to find the relationship between the variables of student engagement, student motivation and student learning satisfaction in the synchronous hybrid learning space. To ensure the findings will reflect the truth as much as possible, the online questionnaire to examine the relationship between the variables of student engagement, motivation, and learning satisfaction was adapted from the student engagement scale (SES) developed by Doğan (2014), the student motivated strategies for learning questionnaire (MSLQ) developed by Pintrich et al. (1993), and the hexagonal e-learning assessment model (HELAM) developed by Ozkan and Koseler (2009) that were valid and reliable. The online questionnaire includes four major components: (a) students' profile, (b) dimensions of student engagement, (c) dimensions of student motivation, and (d) dimensions of student learning satisfaction. The first component is a brief survey of students' profiles including three items namely (1) academic department, (2) academy programme, and (3) gender. Whereas the dimensions of student engagement will be grouped into three subscales: (1) Emotional engagement which consisted of ten items, (2) Cognitive engagement included fourteen items,

and (3) Behavioural engagement contained nine items, as adapted from Doğan (2014). The dimensions of student motivation will be grouped into 3 subscales: (1) Intrinsic goal orientation comprised of four items, (2) Extrinsic goal orientation consisted of four items, and (3) Self-efficacy contained 8 items, as adapted from Pintrich et al. (1993). Lastly, the dimensions of student learning satisfaction will be measured based on four categories: (1) Learners' perspectives comprised of ten items, (2) Lecturer attitudes consisting of twelve items, (3) Information content and quality comprised of fifteen items, whereas (4) service and support quality contained ten items, as adapted from Ozkan and Koseler (2009). A pilot test was conducted to ensure the reliability of the research instrument is acceptable before proceeding with the final data collection. The Cronbach's alpha reliability for the online questionnaire which consisted of 96 items with 6-point-Likert scaling was found to be .972 hence, the study instrument was verified to be highly reliable.

### *Data Collection Procedures*

Figure 2 showed the process flowchart that explained the sequential steps of the data collection procedures of this study.



**Figure 2 Data Collection Procedures**

### **Results**

The online questionnaire via Google Form was completed by a total of 169 TVET student respondents who met the participation criteria: (1) TVET students who had the experience of attending a synchronous hybrid lecture. (2) TVET students who are willing to participate in the study. A detailed overview of the respondents is presented in Table 1.

Table 1 demonstrated that the Electrical Engineering Department had the highest percentage of student respondents (21.9%, N=37). On the contrary, the Commerce Department shows the lowest percentage of student respondents (7.1%, N=12). Additionally, students enrolled in the academy programme Diploma in Information Technology (Digital Technology) had the highest percentage of student participation (16.6%, N=28), whereas students from the academy programme Diploma in Business Studies had the lowest percentage of student participation (3.0%, N=5). Male students made up the majority of the 169 students that responded to the online survey (52.7%, N=89). Overall, the data collected provided a great diversity of TVET students from different academy departments, academy programmes and gender.

**Table 1 Respondent Profile (N=169)**

Profile	Description	Frequency	Percentage
Academy Department	Civil Engineering Department	35	20.7%
	Electrical Engineering Department	37	21.9%
	Information Technology and Communication Department	28	16.5%
	Mechanical Engineering Department	41	24.3%
	Commerce Department	12	7.1%
	Petrochemical Engineering Department	16	9.5%
Academy Programme	Diploma in Civil Engineering	12	7.1%
	Diploma in Building Services Engineering	11	6.5%
	Diploma in Geomatics	12	7.1%
	Diploma in Electronic Engineering (Communication)	18	10.7%
	Diploma in Electrical & Electronics Engineering	19	11.2%
	Diploma in Information Technology (Digital Technology)	28	16.6%
	Diploma in Mechanical Engineering	8	4.7%
	Diploma of Mechanical Engineering (Automotive)	11	6.5%
	Diploma in Mechanical Engineering (Manufacturing)	6	3.6%
	Diploma in Mechanical Engineering (Air Conditioning and Refrigeration)	16	9.5%
	Diploma in Accountancy	7	4.1%
	Diploma in Business Studies	5	3.0%
	Diploma in Process Engineering (Petrochemicals)	16	9.4%
Gender	Male	89	52.7%
	Female	80	47.3%

**Table 2 Coefficient Value of Student Engagement on Learning Satisfaction**

Independent variable	Dependent Variable: Learning Satisfaction		
	$\beta$	$\beta$	$\beta$
Emotional Engagement	.796		
Cognitive Engagement		.932	
Behavioral Engagement			.860
R	.796	.932	.860
R <sup>2</sup>	.633	.869	.740
Adjusted R <sup>2</sup>	.631	.868	.739
F value	287.94*	1105.02*	476.17*
Durbin Watson	1.99	1.66	1.94

Note:

\*Significant at the level of .05

Table 2 showed the inferential findings of student engagement on student learning satisfaction in a synchronous hybrid learning space. The analysis found that the predictor variable, namely emotional engagement, was included in the regression model at  $p < .05$ . The correlation between the predictor variable and student learning satisfaction in a synchronous hybrid learning space was .796. Further,  $R^2 = .633$  demonstrated that 63.3 percent of the changes in student learning satisfaction in synchronous hybrid learning spaces were due to



emotional engagement. The ANOVA test results indicated that there was a significant relationship between the predictor variable and student learning satisfaction at the  $p < .05$  level of significance. For emotional engagement, test results are significant [ $F(1, 167) = 287.94, p < .05$ ]. Next, the findings for cognitive engagement, were included in the regression model at  $p < .05$ . The correlation between cognitive engagement and student learning satisfaction in synchronous hybrid learning space was .932. Additionally,  $R^2 = .869$  indicated that 86.9 percent of the changes in student learning satisfaction were due to cognitive engagement. At the  $p < .05$  level of significance, the ANOVA test results revealed a significant correlation between the predictor variable and student learning satisfaction. For cognitive engagement, test results are significant [ $F(1, 167) = 1105.02, p < .05$ ]. Furthermore, the findings for behavioural engagement, were included in the regression model at  $p < .05$ . The correlation between behavioural engagement and student learning satisfaction in synchronous hybrid learning space was .860. Besides,  $R^2 = .740$  indicated that 74 percent of the changes in student learning satisfaction were due to behavioural engagement. The ANOVA test results showed that there was a significant relationship between behavioural engagement and student learning satisfaction at the  $p < .05$  level of significance. For behavioural engagement, test results are significant [ $F(1, 167) = 476.17, p < .05$ ].

**Table 3 Coefficient Value of Student Motivation on Learning Satisfaction**

Independent variable	Dependent Variable: Learning Satisfaction		
	$\beta$	$\beta$	$\beta$
Intrinsic Goal Orientation	.853		
Extrinsic Goal Orientation		.903	
Self-efficacy			.890
R	.853	.903	.890
R <sup>2</sup>	.728	.815	.792
Adjusted R <sup>2</sup>	.726	.814	.791
F value	447.11*	734.72*	636.36*
Durbin Watson	2.07	1.98	1.23

Note:

\*Significant at the level of .05

Table 3 presented the inferential findings of student motivation on student learning satisfaction in a synchronous hybrid learning space were displayed in Table 3. Based on the analysis, the predictor variable, namely intrinsic goal orientation, was included in the regression model at  $p < .05$ . The correlation between the predictor variable and student learning satisfaction in synchronous hybrid learning space was .853. Further,  $R^2 = .728$  showed that 72.8 percent of the changes in student learning satisfaction in synchronous hybrid learning were due to intrinsic goal orientation. At the  $p < .05$  level of significance, the ANOVA test results revealed a significant correlation between the predictor variable and student learning satisfaction. For intrinsic goal orientation, test results are significant [ $F(1, 167) = 447.11, p < .05$ ]. Next, the findings for extrinsic goal orientation, were included in the regression model at  $p < .05$ . The correlation between extrinsic goal orientation and student learning satisfaction in synchronous hybrid learning space was .903. Further,  $R^2 = .815$  indicated that 81.5 percent of the changes in student learning satisfaction were due to extrinsic goal orientation. The ANOVA test results showed that there was a significant relationship between the predictor variable and student learning satisfaction at the  $p < .05$  level of significance. For extrinsic goal orientation, test results are significant [ $F(1, 167) = 734.72, p < .05$ ]. Finally, the findings for self-efficacy, were included in the regression model at  $p < .05$ . The correlation between self-efficacy and student learning satisfaction in synchronous hybrid learning space was .890. Moreover,  $R^2 = .792$  indicated that 79.2 percent of the changes in student learning satisfaction were due to self-efficacy. The ANOVA test results showed that there was a significant relationship between self-efficacy and student learning satisfaction at the  $p < .05$  level of significance. For self-efficacy, test results are significant [ $F(1, 167) = 636.36, p < .05$ ].

**Table 4 Hypotheses result from Student Engagement in Learning Satisfaction**

Hypotheses	Description	Result
Ho <sub>1(a)</sub>	There is no significant influence of emotional engagement on student learning satisfaction in a synchronous hybrid learning space.	Rejected
Ho <sub>1(b)</sub>	There is no significant influence of cognitive engagement on student learning satisfaction in a synchronous hybrid learning space.	Rejected
Ho <sub>1(c)</sub>	There is no significant influence of behavioural engagement on student learning satisfaction in a synchronous hybrid learning space.	Rejected

Table 4 presented the hypotheses findings of student engagement on student learning satisfaction in a synchronous hybrid learning space, the analysis presented previously found that there is a positive and significant correlation between emotional engagement and student learning satisfaction in a synchronous hybrid learning space ( $R = .796, p < .05$ ). Based on the result, the null hypothesis Ho<sub>1(a)</sub> "There is no significant influence of emotional engagement on student learning satisfaction in a synchronous hybrid learning space" was rejected. In addition, the analysis found that there is a positive and significant correlation between cognitive engagement and student learning satisfaction in synchronous hybrid learning space ( $R = .932, p < .05$ ). hence, the null hypothesis Ho<sub>1(b)</sub> "There is no significant influence of cognitive engagement on student learning satisfaction in a synchronous hybrid learning space" was rejected as well. Furthermore, the analysis also discovered a positive and significant correlation between behavioural engagement and student learning satisfaction in synchronous hybrid learning space ( $R = .860, p < .05$ ). Based on the findings, the null hypothesis Ho<sub>1(c)</sub> "There is no significant influence of behavioural engagement on student learning satisfaction in a synchronous hybrid learning space" was rejected as well.

**Table 5 Hypotheses result from Student Motivation in Learning Satisfaction**

Hypotheses	Description	Result
Ho <sub>2(a)</sub>	There is no significant influence of intrinsic motivation on student learning satisfaction in a synchronous hybrid learning space.	Rejected
Ho <sub>2(b)</sub>	There is no significant influence of extrinsic motivation on student learning satisfaction in a synchronous hybrid learning space.	Rejected
Ho <sub>2(c)</sub>	There is no significant influence of self-efficacy on student learning satisfaction in a synchronous hybrid learning space.	Rejected

Table 5 showed the hypotheses findings of student motivation on student learning satisfaction in a synchronous hybrid learning space. In the synchronous hybrid learning environment, the study revealed that there is a significant and positive correlation between intrinsic goal orientation and student learning satisfaction ( $R = .853, p < .05$ ). Therefore, the null hypothesis Ho<sub>2(a)</sub> "There is no significant influence of intrinsic motivation on student learning satisfaction in a synchronous hybrid learning space" was rejected. Next, extrinsic goal orientation was also found to be positively and significantly associated with student learning satisfaction in synchronous hybrid learning space ( $R = .903, p < .05$ ). Based on the analysis found, the null hypothesis Ho<sub>2(b)</sub> "There is no significant influence of extrinsic motivation on student learning satisfaction in a synchronous hybrid learning space" was also rejected. Finally, the analysis also discovered a positive and significant correlation between self-efficacy and student learning satisfaction in synchronous hybrid learning space ( $R = .890,$

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$p < .05$ ). Hence, the null hypothesis  $H_{0(2)}$ , “There is no significant influence of self-efficacy on student learning satisfaction in a synchronous hybrid learning space” was rejected as well.

## Discussions

### *The Influence of Student Engagement on Student Learning Satisfaction in a Synchronous Hybrid Learning Space*

Based on this study, the inferential findings of student engagement on student learning satisfaction in a synchronous hybrid learning space found that student engagement competencies can predict synchronous hybrid learner learning satisfaction. Cognitive engagement is noticeably the strongest predictor of hybrid learner learning satisfaction where 86.9 percent of changes in student satisfaction were due to students' cognitive engagement. This can be associated with Corno and Mandinach (1983) definition of cognitive engagement as students' commitment to learning and strategic decision-making regarding learning, and Doğan's (2014) definition of cognitive engagement as students' ability and willingness to take on the learning tasks at hand, as well as their willingness to put forth the necessary effort. In a synchronous hybrid learning environment, where students must plan, organise, and select the optimum combination of learning resources, this learning ability is very important (Xiao et al., 2020). Followed 74 percent of the changes in hybrid learner learning satisfaction were due to behavioural engagement. In other words, in a synchronous hybrid learning environment, students who exhibit positive behaviour associated with attention toward learning and the learning process will be more satisfied. Subsequently, 63.3 percent of the changes in hybrid learner learning satisfaction were due to emotional engagement. Hence, student learning satisfaction also depends on the services and amenities they received from the institutions and the people within. These results demonstrate that student engagement that has been used to predict student learning satisfaction in traditional and online classrooms can also be employed in synchronous hybrid learning environments space. This finding might be explained by the fact that synchronous hybrid learning environments combine the best components of traditional on-site and online learning to create a single learning experience. If a synchronous hybrid learning space is well designed and implemented, this flexible, accessible, and engaging learning space can provide the benefits of both onsite and online learning environments such as establishing rich teaching presence, social presence, and cognitive presence (Wang et al., 2017); improve study habits of remote learners, accessibility of materials and integration of educational technology tools help enhance the student learning experience (Romero-Hall & Vicentini, 2017); strengthened communication, support learning, supports dynamic interactions, multiple perspectives, social competencies, immediate teacher-student feedback (Priess-Buchheit, 2020) and; increase the simultaneous presence of offline and online students in support of a seamless student experience, as well as improve the versatility and accessibility of course offerings (Angelone et al., 2020) to support effective learning for both onsite and online students. Therefore, student engagement can be employed in synchronous hybrid learning spaces as well as traditional and online classrooms to predict students' satisfaction with their learning. For a fulfilling synchronous hybrid learning experience, both offline and online students must possess the learning competencies of cognitive, behavioural, and emotional engagement, which are equally important in the traditional and online learning environment.

The findings of this study add to the very limited previous studies that examined the relationships between student engagement and student satisfaction in synchronous hybrid learning spaces. ‘What makes learners a good fit for hybrid learning? Learning competencies as predictors of experience and satisfaction in hybrid learning space’ by Xiao et al. (2020) is one of the very few quantitative studies to investigate predictive learning competencies for hybrid learner satisfaction. The study respondents were 211 Shanghai Open University students enrolled in a hybrid finance course. Partially incongruent with the findings of this study, Xiao et al. (2020) have found that only cognitive engagement is a strong predictor of hybrid learner satisfaction. Whereas student behavioural and emotional engagement are unable to predict student satisfaction in the hybrid learning setting. Partially inconsistent

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outcomes may be the consequence of studies researching in dramatically various situations, such as those with different age groups, course levels, student demographics, instructors, curriculum, and course quality (Jasper, 2021; Xiao et al., 2020). There are several possible reasons for the discrepancy detected between the study by Xiao et al. (2020) and this present study. Firstly, this study samples were TVET students, 18 to 21 years of age. Whereas Xiao et al. (2020) participants were 20 to 60 years of age, with 59 percent of participants majoring in finance and 40.8 percent in other majors. Additionally, the participants of this study are digital natives with digital literacy skills who have experience attending synchronous hybrid learning since the early phase of the COVID-19 pandemic. Whereas, Xiao et al. (2020) participants who have no prior hybrid learning experience were deliberately enrolled in a hybrid learning finance course which was built upon a proposed model at the open university to empower these participants. The differences between the two studies' samples' profiles may contribute to the partial discrepancy in findings. In addition, the respondents for this present study are TVET students who had attended synchronous hybrid lectures both offline and online simultaneously whereas, the study by Xiao et al. (2020) might have only reflected the learning satisfaction of either fully traditional offline learners or fully digital learners since the respondents could freely choose to attend either online or offline based on each preference. Due to the learner's self-selection of learning modes, the perceived hybrid learner satisfaction in the study by Xiao et al. (2020) may have biases since this learner's learning experience and competencies may only represent entirely offline or online modes.

### ***The Influence of Student Motivation on Student Learning Satisfaction in a Synchronous Hybrid Learning Space***

The results of this study are consistent with earlier research suggesting that student motivation during traditional classroom instruction or in an online learning environment positively influences student learning satisfaction (Erhuvwu & Adeyemi, 2019; Law et al., 2019). The results also align with Obiosa's (2020) study on student motivation, engagement, and learning satisfaction regarding on-site lecture teaching in higher education as well as She et al. (2021)'s study on online learning satisfaction during the COVID-19 pandemic.

Congruent with previous studies (Erhuvwu & Adeyemi, 2019; Law et al., 2019; Obiosa, 2020; She et al., 2021), this study revealed that extrinsic goal orientation has a pronounced impact on hybrid learners' learning satisfaction was 81.5 percent of changes in student satisfaction were due to students' extrinsic goal orientation. Hence, student motivation derives from the factors of getting good grades, competing with others and seeking approval or rewards (Chyung, Moll, & Berg, 2010; Duncan, Pintrich, Smith, & Mckeachie, 2015) will positively impact student learning satisfaction in an asynchronous hybrid learning space. Next, this study found that 79.2 percent of the changes in hybrid learner learning satisfaction were due to self-efficacy. Zhen, Liu, Ding, Wang, Liu, and Xu (2017) reported that students with a greater level of self-efficacy engaged in more learning strategies to deal with learning challenges to attain specific academic goals. She et al. (2021) found that students with higher self-efficacy reflect higher confidence and belief in their ability to control their desire to compete and master learning tasks in Massive Open Online Courses (MOOCs), which in turn contribute to an increase in learning satisfaction. Consistent with She et al. (2021), this study further provides evidence that self-efficacy is important in synchronous hybrid learning spaces which required a higher level of technical competency and proficiency (Ashraf, Yang, Zhang, Denden, Tlili, Liu, Huang & Burgos, 2021; Weitze & Ørngreen, 2014) where students from both on-site and online, engage in learning in a shared learning space via multiple modes of delivery. Therefore, students must possess a high level of self-efficacy to confidently explore and deal with the challenges associated with the different hybrid learning strategies; master the skills being taught; understand the complex materials presented simultaneously to both remote and online students in synchronous hybrid learning. Moreover, this study found that 72.8 percent of the changes in hybrid learners' learning satisfaction were due to intrinsic goal orientation. It could be inferred from the findings that students who are being curious, want to challenge, and want to master the learning content (Chyung et al., 2010; Duncan et al., 2015) will gain higher learning satisfaction in a synchronous hybrid learning space. Based

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on the findings of this study, it can be reported that student motivation namely intrinsic goal orientation, extrinsic goal orientation, and self-efficacy significantly predict synchronous hybrid learners' satisfaction.

However, student motivation competencies which are reported to be predictive of student learning satisfaction in general learning and online learning settings in most of the literature, do not predict hybrid learner satisfaction, according to a study by Xiao et al. (2020). Xiao et al. (2020) have found that student motivation namely intrinsic goal orientation, extrinsic goal orientation, and self-efficacy has no significant influence on hybrid learner satisfaction. According to Xiao et al. (2020), because synchronous hybrid learning is flexible and offers all offline and online learning options, students can select the option that best suits individual needs. As a result, Xiao et al. (2020) argued that student motivation competencies do not significantly predict student satisfaction. Discrepant results reported can be due to the several discrepancies detected between the study by Xiao et al. (2020) and this present study such as different samples, course levels, different instructors, curriculum, and course quality (Jasper, 2021; Xiao et al., 2020). Ji et al. (2022) study to examine the relationship between engagement, readiness, and satisfaction in a synchronous online second language learning environment from the beginning of the semester through the end of the semester at the early phase of the COVID-19 pandemic is worth discussing in the light of the discrepancy in the findings. The findings of Ji et al. (2022) study has revealed that engagement namely emotional, cognitive, and behavioural are significant predictors of learning satisfaction at the end of the semester but not at the start, hence readiness plays an important role in synchronous online course satisfaction. The discrepancy in the results may be caused by the fact that the Xiao et al. (2020) study was carried out during the early phases of the COVID-19 pandemic, whereas the current study was carried out in the endemic phase of the pandemic in mid-2022. Thus, the respondents' varying levels of readiness may influence student motivation which in turn contributes to the discrepancy in the findings.

## Conclusion

Based on the research findings and discussions given, it could be concluded that there were significant influences of student engagement (i.e., emotional, cognitive, and behavioural) and student motivation (i.e., intrinsic goal orientation, extrinsic goal orientation, and self-efficacy) on student learning satisfaction in a synchronous hybrid learning space. These findings can help policymakers, academic institutions, and lecturers make decisions about how to design, implement, and improve synchronous hybrid learning environments. This study suggests that for institutions and lecturers to identify areas where improvements are required and to provide the best experience suited to the needs of the students, it is necessary to examine the various dimensions of student engagement and motivation to increase student learning satisfaction in synchronous hybrid learning spaces. This study also found that lecturers with high levels of skill in designing and conducting synchronous hybrid learning courses had a favourable impact on TVET students' motivation and engagement, which enhances student learning satisfaction. As a result, it is crucial to raise the calibre of lecturers by providing the lecturers with the information and abilities required to instruct in a synchronous hybrid learning space. The current study also included several limitations that had to be considered in future research. Firstly, the study sample is based on one TVET institution in Kuching which might not adequately reflect the entire TVET institutions throughout Malaysia, limiting the findings' generalizability. Researchers are encouraged to replicate and expand this study using a larger and more diverse sample from multiple TVET institutions, colleges, and universities across Malaysia to gain deeper knowledge about the topics. Additionally, this study only examines the level of student motivation based on three dimensions: (1) intrinsic goal orientation, (2) extrinsic goal orientation, and (3) self-efficacy, adapting from the student motivation scale developed by Pintrich et al. (1993). The other dimensions of student motivation identified by Pintrich et al. (1993) are worth discussion as well, such as task value, control of learning beliefs and test anxiety. In addition, this study raised an uncertainty of whether ICT and readiness which are found predictive in online

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learning satisfaction can be applied in synchronous hybrid learning space as well. The role of ICT infrastructure facilities and readiness are other predictors of student satisfaction that are worth examining in future studies, in addition to the learning competencies, namely student engagement and student motivation as the predictor variables to student synchronous hybrid learning satisfaction. Even though the quantitative research methodology employed in this study is beneficial in determining the significant influence of student involvement and motivation on student learning satisfaction in a synchronous hybrid learning environment, the 6-point Likert scale questionnaire used in the quantitative research approach alone was insufficient to provide the researcher with in-depth and contextualised insights into the qualitative data. Therefore, future research could utilise mixed methods research design that includes both quantitative questionnaires and qualitative measures such as comprehensive interviews that could provide richer narratives that would contribute to an in-depth knowledge of the influence of student engagement and student motivation on synchronous hybrid learners learning satisfaction.

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