Evaluating the satisfaction of hybrid learning among undergraduate health science students

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Abstract

Background: Hybrid learning combines traditional face-to-face instruction with online or digital learning components and has gained significant popularity in recent years. **Objective:** This study aimed to assess the satisfaction of hybrid learning among undergraduate health science students and identify the factors associated with the satisfaction level, providing further insights into improvements in hybrid learning adoption to make effective use of the learning approach. **Methods:** An online survey was distributed to the undergraduate health science students at Taylor's University in Malaysia. Students' satisfaction and the associated factors were assessed using a 5-point Likert scale using Pearson Chi-square and logistic regression analysis test where *p-value* < 0.05 is considered statistically significant. **Results:** More than half of the students (66.7%) in this study expressed positive satisfaction towards hybrid learning. Internet connection was determined as one of the students' satisfaction-related factors (p = xx). Multivariate binary logistics regression demonstrated that course structure, perceived ease of use, student-instructor interaction and students' attitude toward hybrid learning had a statistically significant impact on students' satisfaction with the hybrid learning approach. **Conclusion:** Students' satisfaction is valuable input for institutions and instructors to enhance the quality of hybrid learning in the future to optimise students' learning experience.

Introduction

Hybrid learning, a combination of traditional and online education, has recently gained popularity due to the COVID-19 pandemic (Marey *et al.*, 2022). This approach combines physical and online learning, enhancing student experience and maintaining continuity during the pandemic (Suwantarathip, 2019). However, it has drawbacks, such as social isolation, lack of discipline, and technical issues. To achieve good academic performance, students need strong discipline and effective communication with instructors (Azizan, 2010).

Evaluating student satisfaction with hybrid learning is crucial to determine its effectiveness. While many studies have been conducted on online learning, studies on satisfaction with hybrid learning, particularly among health science students, are limited. This study aims to evaluate satisfaction levels among health

science students with the hybrid learning approach and identify factors associated with their satisfaction, which can contribute to the effective implementation of hybrid learning in health science courses.

Methods

Study design

Taylor's University in Malaysia uses a hybrid learning model, combining physical and online classes. This study focuses on student satisfaction with hybrid learning and its factors. Data was collected from undergraduate students using a self-administered questionnaire.

Sample size

Using the online Raosoft sample size calculator, the minimum sample size necessary to attain a 95% confidence level with a 5% margin of error and maximum variability of 50% in response distribution was 267 undergraduate students. According to Table I, a total of three hundred students (n=300) who met the inclusion and exclusion criteria participated in this study.

Table I: Inclusion and exclusion criteria

Parameters	Inclusion criteria	Exclusion criteria
University	Students who are enrolled at Taylor's University	Students who are not enrolled at Taylor's University
Course of study	Undergraduate students who study for: • Bachelor of Medicine and Surgery (MBBS) • Bachelor of Pharmacy (Hons) • Bachelor of Biomedical Science (Hons)	Undergraduate students who do not study for: • Bachelor of Medicine and Surgery (MBBS) • Bachelor of Pharmacy (Hons) • Bachelor of Biomedical Science (Hons)
Learning approach	With the experience of hybrid learning mode	Without the experience of hybrid learning mode
Method	Able to access the online questionnaire	Unable to access the online questionnaire
Informed consent	Willing to provide informed consent	Refuses to provide informed consent

Survey instrument

The questionnaire was adopted and adapted from the study conducted by Suwantarathip (2019). The questionnaire was divided into Part I, Part II, and Part III. Part I collected demographic data and student experience, while Part II surveyed satisfaction variables such as course structure, perceived ease of use, interactions, attitudes, and computer literacy. The overall satisfaction level was assessed using a 5-point Likert Scale. The initial questionnaire was reviewed by three lecturers from Taylor's University and modified based on feedback. A pilot study was conducted with 30 participants to evaluate its feasibility. Cronbach's alpha test was used to measure internal consistency, with a Cronbach alpha value of 0.709 - 0.89 indicating acceptable internal consistency.

Data collection

The online survey questionnaire was distributed to the students between January and May 2023. Prior to completing the survey, participants were asked to provide informed consent. This survey was shared through a Google link, and weekly reminders were sent to all students until the required sample size of 300 students was achieved.

Data analysis

All categorical variables in the study were presented in terms of n(%). There were a total of five sections of the satisfaction determinants, and the Likert scale statements under each section were analysed by summing the scores of the students. In every section, the total score was used to yield the median value, which served as the cut-off point to classify the participants into high and low groups based on their level of agreement with the statements provided in the survey. Pearson chi-square was used to determine the relationship between demographic characteristics and satisfaction with hybrid learning. Furthermore, logistic regression analysis was utilised to examine the associations between various variables and the level of satisfaction with hybrid learning. A p-value of < 0.05 was considered statistically significant.

Results

Student's demographic characteristics

The study collected 300 responses, with a higher prevalence of female students (76.6%) compared to male students (23.3%). The majority (75.3%) were aged

between 18-22 years old, with 28.3% in the first and third years of study (Table II). Over half (68%) preferred individual learning over group learning. A significant proportion of participants reported satisfactory internet connectivity during hybrid learning, with a smaller percentage of respondents reporting having an excellent internet connection (22%), while a minority of participants experienced a poor internet connection (6.3%). Figure 1 shows the overall satisfaction of hybrid learning among health science students.

Table II: Demographic characteristics of participants

Variables	Number of respondents, n (%)
Gender	
Male	70 (23.3)
Female	230 (76.7)
Age	
Under 18	0 (0)
For this 18 - 22	226 (75.3)
23 - 25	67 (22.3)
Above 25	7 (2.3)
Year of intake	
Year 1	85 (28.3)
Year 2	55 (18.3)
Year 3	85 (28.3)
Year 4	64 (21.3)
Year 5	11 (3.7)
Course of study	
Bachelor of Medical and Surgery (MBBS)	70 (23.3)
Bachelor of Pharmacy	118 (39.3)
Bachelor of Biomedical Sciences	112 (37.3)
Preferred mode of learning	
Individual	204 (68)
Group	96 (32)
Internet connection during hybrid learning	
Poor	19 (6.3)
Satisfactory	215 (71.7)
Excellent	66 (22)
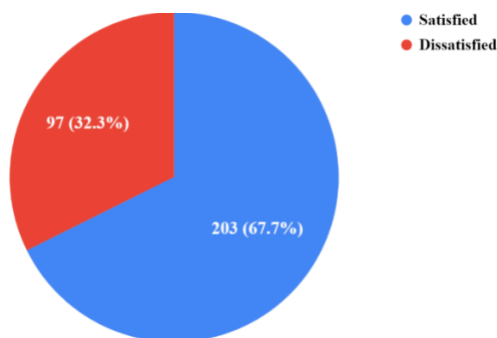
Figure 1: Overall satisfaction of hybrid learning among health science students

Association between the demographic characteristics with student satisfaction level

The Pearson Chi-square analysis found no significant association between demographic characteristics and satisfaction levels in hybrid learning (Table III). However, satisfaction was significantly associated with internet connection, with students with satisfactory and excellent internet connections reporting higher satisfaction levels. This suggests that internet connection was a key factor in satisfaction.

Table III: Association between demographic characteristics and satisfaction level with hybrid learning

Variables	Prevalence, n (%)		*p*-value
	Dissatisfied	**Satisfied**	
Gender			0.490
Male	25 (25.8)	45 (22.2)	
Female	72 (74.2)	158 (77.8)	
Age			0.341
Under 18	0 (0)	0 (0)	
18 - 22	77 (79.4)	149 (73.4)	
23 - 25	17 (17.5)	50 (24.6)	
Above 25	3 (3.1)	4 (2)	
Year of intake			0.117
Year 1	30 (30.9)	50 (27.1)	
Year 2	19 (19.6)	36 (17.7)	
Year 3	31 (32.0)	54 (26.6)	
Year 4	12 (12.4)	52 (25.6)	
Year 5	5 (5.2)	6 (3.0)	
Course of study			0.144
Bachelor of Medical and Surgery (MBBS)	23 (23.7)	47 (23.2)	
Bachelor of Pharmacy	31 (32.0)	87 (42.9)	
Bachelor of Biomedical Sciences	43 (44.3)	69 (33.9)	
Preferred mode of learning			0.433
Individual	63 (64.9)	141 (69.5)	
Group	34 (35.1)	62 (30.5)	
Internet connection			0.047*
Poor	9 (9.3)	10 (4.9)	
Satisfactory	74 (76.3)	141 (69.5)	
Excellent	14 (14.4)	52 (25.6)	

* Pearson Chi-square test of association between demographic characteristics and satisfaction level with hybrid learning; *p* < 0.05 shows significant association.

Association between the satisfaction determinants with student satisfaction level

Table IV shows the satisfaction determinants of each variable score and prevalence. High perception of course structure was associated with an 8.53 times

greater likelihood of students being satisfied compared to those with low perception (AOR= 8.53, 95% CI 3.51, 20.72). Similarly, perceived ease of use played a vital role, with students finding the system easy to operate having 3.47 times higher odds of experiencing high satisfaction levels (AOR= 3.47, 95% CI 1.63, 7.40). Additionally, a positive attitude toward hybrid learning was linked to a 3.40 times higher likelihood of student satisfaction compared to those with a negative attitude

(AOR= 3.40, 95% CI 1.43, 8.09) (Table V). Moreover, a high level of student-instructor interaction within the learning environment resulted in 2.21 times greater odds of experiencing higher satisfaction levels (AOR= 2.21, 95% CI 1.04, 4.73). On the other hand, the study found no statistically significant association between computer literacy and student satisfaction, indicating that computer literacy did not significantly impact student satisfaction.

Table IV: Satisfaction determinants

Variables	Score			Prevalence, n	
	Minimum	Maximum	Median	Low	High
Course structure	10	35	27	145	155
Perceived ease of use	14	30	23	135	165
Interaction	6	25	18	137	163
Attitudes toward hybrid learning	6	30	24	143	157
Computer literacy	10	25	23	129	171

Table V: Association between different variables and satisfaction level with hybrid learning

Variables	Satisfaction	COR (95% CI)	AOR (95% CI)
Course structure	Low	Reference	Reference
	High	29.20 (13.30, 64.10)*	8.53 (3.51, 20.72)*
Perceived ease of use	Low	Reference	Reference
	High	9.63 (5.40, 17.17)*	3.47 (1.63, 7.40)*
Interaction	Low	Reference	Reference
	High	9.18 (5.15, 16.34)*	2.21 (1.04, 4.73)*
Attitudes toward hybrid learning	Low	Reference	Reference
	High	17.71 (9.00, 34.84)*	3.40 (1.43, 8.09)*
Computer literacy	Low	Reference	Reference
	High	3.60 (2.17, 5.97)*	1.02 (0.48, 2.13)

* COR: crude odds ratio; AOR: adjusted odds ratio; The values show significant association ($p < 0.05$).

Discussion

Students with reliable internet tend to be more satisfied, while poor connectivity can lead to motivation loss and dissatisfaction (Karim *et al.*, 2022). Issues such as difficulty uploading and downloading course materials were common in areas with limited internet access (Rianto, 2020). Stable internet enables effective access to course materials and participation in online discussions. Effective course design with clear objectives and structured content was vital to meeting student needs and improving satisfaction (Masrom *et al.*, 2019; Zeqiri *et al.*, 2021). Conversely, poorly designed learning systems can cause confusion and frustration among students, hindering effective use of

materials and decreasing their satisfaction with the learning approach (Elshami *et al.*, 2021).

Students accepted the approach when the learning management system was simple and easy to operate. (Al-Azzam, *et al.*, 2020; Dinh *et al.*, 2021; Wu & Liu, 2013). The ease of use of learning management systems drives students to explore and engage with the system more frequently (Ocampo, 2023). Moreover, interaction between lecturers and students was also found to affect the implementation of the hybrid education system in institutions, such as providing timely feedback. When students are not able to promptly clarify their understanding of the lessons due to minimum interaction, they may become less

motivated to study in this hybrid setting (Azlan *et al.*, 2020).

Effective interaction between lecturers and students was pivotal in the success of the hybrid education system. The hybrid approach enables both in-person and online interactions, enhancing the learning experience and satisfaction (Rajabalee *et al.*, 2020). Interaction reduces stress and motivates students, as noted by Wu & Liu (2013) and Dinh et al. (2021). Prioritising interactive activities, case discussions, and group presentations encourage active participation and collaboration (Sukadarma *et al.*, 2022; Zeqiri *et al.*, 2021).

Hybrid learning offers students greater control over their learning progress, providing a personalised experience. Students find it more convenient than face-to-face learning, as they can allocate time according to their preferences and schedules (Hamid *et al.*, 2020). The adoption of learning management systems, such as learning progress trackers, helps track students' progress and academic performance (Masrom *et al.*, 2019).

Surprisingly, the finding revealed that computer literacy was not regarded as one of the factors that affect student satisfaction levels with hybrid learning. This result was inconsistent with the previous study conducted by Dinh et al. (2021), who indicated a positive association between computer literacy and student satisfaction. Students who were competent in using the technology tended to be more satisfied with hybrid courses, as their expectations towards such courses were more likely to be met.

Conclusion

The study underscores the growing prominence of hybrid learning in higher education. Key factors influencing satisfaction include internet connection, course structure, ease of use, student-instructor interaction, and student attitudes. To optimise hybrid learning, institutions must prioritise well-structured courses, user-friendly platforms, and enhanced student-teacher interactions, ensuring an engaging and supportive learning environment for students.

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