Online Learning Satisfaction of Sport Science Students: A Comparative Study between Public and Private Universities in Malaysia

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Abstract
The rapid expansion of online learning in higher education, accelerated by the COVID-19 pandemic, has raised concerns regarding its effectiveness for practice-oriented disciplines such as sport science. This study aimed to compare online learning satisfaction among sport science students enrolled in Malaysian Public Higher Education Institutions (IPTA) and Private Higher Education Institutions (IPTS), and to identify factors influencing satisfaction across institutional sectors. A quantitative, descriptive–comparative design was employed involving 184 undergraduate sport science students (IPTA = 88; IPTS = 96). Data were collected using a structured questionnaire measuring students' readiness, implementation of online learning, and overall satisfaction. Descriptive statistics, independent-samples t-tests, and multiple linear regression analyses were conducted. Findings indicated that students from both IPTA and IPTS reported moderate levels of readiness, implementation quality, and online learning satisfaction. No statistically significant differences were found between public and private institutions across all domains ($p > .05$), with only small effect sizes observed. Regression analysis revealed that implementation of online learning and students' readiness were significant positive predictors of satisfaction, whereas institution type and demographic variables were not significant contributors. These results suggest that online learning satisfaction among sport science students is shaped more by pedagogical quality and student preparedness than by institutional sector. Given the practical nature of sport science education, the findings highlight the need to enhance online teaching strategies, technological support, and student readiness to improve learning experiences across both public and private universities. The study provides evidence-based insights to inform more effective and equitable online and blended learning practices in sport science education.
Keywords: Online Learning, Student Satisfaction, Sport Science Education, Institutional Comparison, Higher Education, Malaysia

Introduction

The rapid expansion of digital technologies has transformed higher education globally, with online, blended, and distance learning becoming central modes of delivery across universities. Online learning gained particular prominence during the COVID-19 pandemic, when widespread campus closures led institutions to replace face-to-face instruction with virtual platforms to maintain academic continuity (Anouti & Rouadi, 2020; Whalen, 2020). This shift created new opportunities for flexible, self-paced, and accessible learning, especially for students balancing academic, work, and family responsibilities (Johnson et al., 2015). At the same time, it exposed persistent challenges related to digital readiness, instructional quality, interaction, and equity of access, particularly in developing and middle-income contexts (Isaac et al., 2019).

In Malaysia, both Public Higher Education Institutions (IPTA) and Private Higher Education Institutions (IPTS) have widely implemented online learning in line with national higher education goals. These two sectors operate within distinct structural and resource environments, which may influence technological infrastructure, teaching practices, and student support systems (Mahmood, Dangi, et al., 2014). Such differences raise important questions about whether students' online learning experiences—and their satisfaction—vary between public and private institutions, potentially contributing to inequalities in educational quality and outcomes.

These challenges are especially evident in practice-oriented disciplines such as sport science, where learning relies heavily on laboratory work, coaching practice, and embodied physical skills. Previous studies suggest that sport science and physical education students often perceive fully online learning as less engaging and less effective for developing practical competencies compared with face-to-face instruction (Bali & Liu, 2018; Killian & Woods, 2022; Setiakarnawijaya et al., 2022). Although emergency adaptations such as video demonstrations and virtual workshops were widely used during the pandemic, concerns remain regarding learning depth, skill transfer, and meaningful feedback in online sport science courses (Iuliano et al., 2021; Moustakas & Robrade, 2022).

Student satisfaction, commonly defined as students' overall evaluation of their learning experiences, is a key indicator of educational quality in online learning environments. Research consistently highlights the importance of learner–content, learner–instructor, and learner–learner interactions, along with technological usability and instructional design, in shaping satisfaction and perceived learning outcomes (Su & Guo, 2021; Wei & Chou, 2020; Xu & Xue, 2023). However, despite growing interest in online learning, relatively few studies have focused on satisfaction within sport science programs, and even fewer have compared public and private institutional contexts.

In Malaysia, existing research on online learning has largely examined general student populations or single institutional types, emphasizing readiness and overall satisfaction rather than sector-based comparisons within specific disciplines (Isaac et al., 2019; Wei & Chou, 2020). Consequently, there remains limited empirical evidence on how institutional type (IPTA vs. IPTS) influences online learning satisfaction among sport science students, particularly given discipline-specific demands and contextual differences in resources and infrastructure.

Addressing this gap, the present study compares online learning satisfaction among sport science students in Malaysian Public Higher Education Institutions (IPTA) and Private Higher Education Institutions (IPTS), and identifies key factors associated with satisfaction within each sector. This study is novel in offering a discipline-specific, sector-based comparison of online learning satisfaction within the Malaysian higher education context, an area that has received limited empirical attention. By focusing on sport science—a field with strong practical and embodied learning requirements—this research extends existing online learning literature beyond general student populations. The findings contribute to the social sciences by enhancing understanding of how institutional structures, resource disparities, and disciplinary demands shape students' online learning experiences, with implications for educational equity, policy development, and the design of more inclusive and effective online learning practices.

Methodology
Study Design
This study employed a quantitative, descriptive–comparative research design to examine and compare levels of online learning satisfaction among sport science students enrolled in Malaysian Public Higher Education Institutions (IPTA) and Private Higher Education Institutions (IPTS).

Population and Sample
The target population comprised undergraduate sport science students (diploma and degree levels) enrolled in selected IPTA and IPTS in Malaysia who had experienced online learning as part of their academic programmes. These students were considered suitable respondents due to their direct exposure to both theoretical and practice-oriented sport science courses delivered online. Sample size estimation was conducted using G*Power version 3.1.9.7 based on an independent samples t-test. Assuming a medium effect size (Cohen's d = 0.50), a significance level of $\alpha = 0.05$, and statistical power of 0.80, the minimum required sample size was 128 respondents, with equal representation from IPTA (n = 64) and IPTS (n = 64). To enhance representativeness and reduce sampling bias, stratified random sampling was applied, ensuring proportional participation from both institutional sectors and programme levels.

Instrumentation
Data were collected using a structured self-administered questionnaire adapted from validated instruments used in prior studies on online learning satisfaction (Nuraeni, 2025). The questionnaire consisted of three sections: Section A: Demographic Information, which captured respondents' gender, age, programme level, year of study, and type of institution (IPTA or IPTS); Section B: Students' Readiness and Online Learning Implementation, which assessed factors such as motivation, engagement, access to technology, interaction with lecturers and peers, and perceived ease of online learning; Section C: Online Learning Satisfaction, which measured students' overall satisfaction with course structure, alignment of assessments with learning outcomes, and effectiveness of the online learning system.

All attitudinal items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument was reviewed by subject experts to ensure content validity and was pilot-tested prior to full deployment to improve clarity and reliability.

Data Collection Procedure
Ethical approval was obtained prior to data collection (Ethical Approval Reference No.: UiTM.FSR - 7/6/3). Participation was voluntary, and informed consent was secured from all respondents. Data were collected over a three-week period using an online questionnaire distributed via Google Forms, allowing respondents to complete the survey at their convenience. Standardised instructions were provided to ensure uniform administration. Weekly reminders were issued to increase response rates, and incomplete responses were excluded from analysis.

Data Analysis
Data were analysed using IBM SPSS Statistics. Descriptive statistics (means, standard deviations, and frequencies) were computed to determine levels of online learning satisfaction among IPTA and IPTS students. Instrument reliability was assessed using Cronbach's alpha. To examine differences in satisfaction between public and private institutions, an independent samples t-test was performed. Where applicable, correlational and regression analyses were conducted to identify key factors influencing online learning satisfaction. Statistical significance was set at $p < 0.05$.

Results

Respondent Characteristics
A total of 184 undergraduate Sport Science students from public (IPTA) and private (IPTS) higher education institutions in Malaysia participated in this study. The sample was well balanced by gender, with slightly more respondents from IPTS (52.2%) and degree-level students (58.2%) (Table 1).

Table 1
Demographic Characteristics of Respondents (N = 184)

Variable	Category	n	%
Gender	Male	93	50.5
	Female	91	49.5
Type of Institution	IPTA	88	47.8
	IPTS	96	52.2
Programme Level	Diploma	77	41.8
	Degree	107	58.2

Table 2 presents the mean (± SD) scores for students' readiness, implementation, and satisfaction with online learning among IPTA and IPTS students. Students' readiness, which was measured using items related to infrastructure, internet access, technological ability, and motivation, showed a moderate level for both institution types, with only minimal differences observed between IPTA and IPTS students. The implementation domain, which assessed students' perceptions of lecturers' delivery, learning resources, interaction, and instructional effectiveness, also indicated a moderate level of implementation quality for online learning in both groups, with slightly higher mean scores reported by IPTA students. Students' overall satisfaction with online learning, measured across teaching quality, assessment, learning outcomes, and system satisfaction, was likewise found to be at a moderate level, with IPTA

students demonstrating marginally higher satisfaction scores compared to their IPTS counterparts.

Table 2
Mean (± SD) of students' readiness, implementation and students' satisfaction scores in IPTA and IPTS

Domain	IPTA (n=88)	IPTS (n=96)
Student's Readiness	3.02 ± 0.58	3.04 ± 0.55
Implementation of Online Learning	3.04 ± 0.52	3.00 ± 0.49
Student's Satisfaction	3.15 ± 0.57	3.04 ± 0.54

Comparison of Domains Between IPTA and IPTS
Independent-samples t-tests were conducted to compare readiness, implementation, and satisfaction scores between students from IPTA and IPTS.

Table 3
Independent t-test Comparing Readiness, Implementation and Satisfaction Between IPTA and IPTS

Variable	Group	Mean	SD	t (df = 182)	p	Cohen's d
Readiness	IPTA (n = 88)	3.05	0.41			
	IPTS (n = 96)	3.03	0.41	0.43	0.668	0.06
Implementation	IPTA (n = 88)	3.03	0.45			
	IPTS (n = 96)	2.99	0.37	0.79	0.431	0.12
Satisfaction	IPTA (n = 88)	3.15	0.56			
	IPTS (n = 96)	3.05	0.57	1.23	0.222	0.18

* Positive Cohen's d indicates higher scores for IPTA students.

There were no statistically significant differences between IPTA and IPTS students (all p > .05) on all three domains (readiness, implementation, satisfaction). Effect sizes (Cohen's d = 0.06–0.18) were small, indicating that any differences in mean scores between IPTA and IPTS are practically negligible. Thus, online learning satisfaction levels are comparable between students in public and private universities in this sample.

Factors Influencing Online Learning Satisfaction
Multiple linear regression analysis was conducted to determine the factors influencing online learning satisfaction among Sport Science students. Satisfaction score was entered as the dependent variable, while readiness score, implementation score, institution type, gender, age, year of study, and programme level were entered as predictors.

The regression model was statistically meaningful, explaining 13.5% of the variance in online learning satisfaction ($R^2 = 0.135$). The results showed that implementation of online learning (B = 0.327, p = 0.003) and students' readiness (B = 0.245, p = 0.025) were significant positive predictors of satisfaction. Institution type (IPTA vs IPTS) did not significantly predict satisfaction (p = 0.052), indicating that the influence of readiness and implementation on satisfaction was consistent across both institution types. Other demographic variables were

not statistically significant (p > 0.05). **Figure 1** illustrates the positive relationship between implementation score and online learning satisfaction.
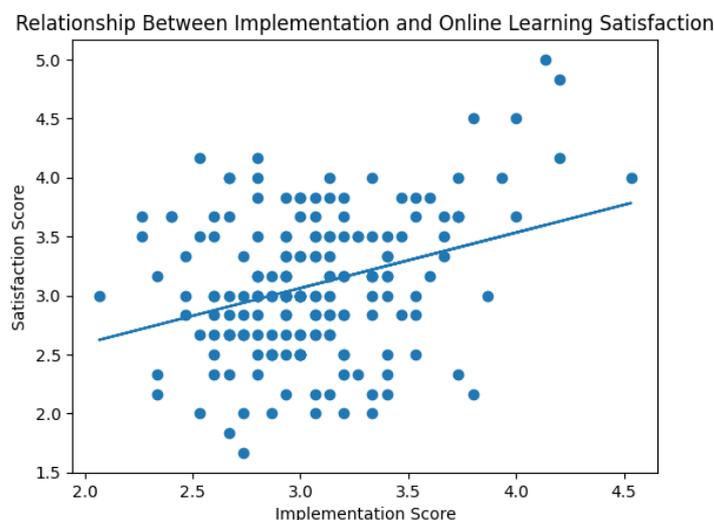

Figure 1 Relationship Between Implementation and Online Learning Satisfaction

Discussion
This study examined online learning satisfaction among sport science students in Malaysian Public Higher Education Institutions (IPTA) and Private Higher Education Institutions (IPTS), with particular attention to differences between institutional sectors and factors influencing satisfaction. Overall, the findings indicate that students from both IPTA and IPTS reported moderate levels of online learning satisfaction, and that institutional type did not significantly differentiate students' satisfaction levels. Additionally, implementation of online learning and students' readiness emerged as the primary predictors of satisfaction, regardless of whether students were enrolled in public or private universities.

Online Learning Satisfaction Across Institutional Sectors
One of the key findings of this study is the absence of statistically significant differences in online learning satisfaction between IPTA and IPTS students (Pratheebha & Jayaraman, 2022). Although IPTA students demonstrated marginally higher mean satisfaction scores, the difference was small and not statistically meaningful. This finding suggests that institutional sector alone is insufficient to explain variations in online learning satisfaction among sport science students.

This result aligns with previous research in the Malaysian higher education context, which has shown that student satisfaction is more strongly influenced by instructional quality, technological usability, and interaction than by institutional ownership or funding structure (Mahmood, Mat Dangi, et al., 2014a, 2014b). While private universities are often perceived as offering superior facilities or more flexible learning environments, the present findings indicate that such structural differences may not translate into substantially different online learning experiences, particularly during periods of widespread online adoption.

The moderate satisfaction levels observed in both groups are consistent with earlier studies conducted in sport science and physical education settings. Bali and Liu (2018) and

Setiakarnawijaya et al. (2022) reported that students in physically oriented disciplines often express ambivalent attitudes toward online learning, appreciating its flexibility while questioning its effectiveness for skill-based learning. Similarly, Moustakas and Robrade (2022) found that sport and physical education students viewed online learning as a necessary but imperfect substitute for face-to-face instruction, particularly for practical and experiential components.

Taken together, these findings suggest that disciplinary characteristics may play a more prominent role than institutional sector in shaping students' satisfaction with online learning. The practice-oriented nature of sport science appears to impose similar constraints on online delivery across both public and private universities.

Factors Influencing Online Learning Satisfaction
Beyond institutional comparisons, this study identified implementation of online learning and students' readiness as significant predictors of online learning satisfaction. Implementation quality emerged as the strongest predictor, highlighting the importance of lecturers' competence in delivering online content, the accessibility of learning resources, and opportunities for meaningful interaction.

This finding is consistent with established online learning literature, which emphasises the central role of instructional design and lecturer engagement in shaping students' online experiences (Wei & Chou, 2020). In the context of sport science, effective implementation may be particularly critical, as lecturers must adapt pedagogical strategies to convey movement-based concepts, practical demonstrations, and applied knowledge through digital platforms. The positive association between implementation quality and satisfaction observed in this study reinforces the need for targeted professional development to enhance lecturers' online teaching competencies.

Students' readiness was also found to be a significant predictor of satisfaction, indicating that technological skills, motivation, and access to online learning infrastructure remain important determinants of positive learning experiences. This finding supports earlier research demonstrating that students who feel more prepared and confident in using online learning technologies tend to report higher satisfaction and engagement (Wei & Chou, 2020; Xu & Xue, 2023). In sport science education, where students may be accustomed to hands-on learning environments, readiness may influence how effectively they adapt to online modalities.

Importantly, institution type did not significantly moderate the relationship between these factors and satisfaction. This suggests that readiness and implementation exert similar effects on student satisfaction across both IPTA and IPTS, reinforcing the notion that pedagogical and individual factors outweigh sector-based differences (Ramli et al., 2020; Zahari et al., 2025). Demographic variables such as gender, age, year of study, and programme level were also not significant predictors, indicating that online learning satisfaction in this sample was relatively consistent across student subgroups.

Implications for Sport Science Education

The findings of this study have several practical implications for sport science education in Malaysia. First, efforts to enhance online learning satisfaction should prioritise improving implementation quality, particularly through innovative pedagogical approaches that address the limitations of online delivery for practical-based learning. Blended learning models, virtual simulations, video-based skill demonstrations, and structured peer collaboration may help bridge the gap between theoretical knowledge and practical application.

Second, institutions should continue to support students' readiness for online learning by ensuring access to reliable technology, providing digital literacy training, and fostering motivation and engagement (Ramli et al., 2020). Such initiatives are likely to benefit students across both public and private sectors.

Finally, the lack of significant differences between IPTA and IPTS students suggests that policy and practice improvements should be discipline-focused rather than sector-focused. Rather than assuming inherent advantages within one institutional type, stakeholders should consider how the unique demands of sport science education can be better accommodated within online and blended learning environments.

Conclusion

This study examined online learning satisfaction among sport science students in Malaysian Public Higher Education Institutions (IPTA) and Private Higher Education Institutions (IPTS), with the aim of identifying differences between institutional sectors and determining key factors influencing satisfaction. The findings indicate that students from both IPTA and IPTS reported moderate levels of online learning satisfaction, and that no statistically significant differences were observed between the two groups. These results suggest that institutional sector alone does not play a decisive role in shaping online learning satisfaction within the context of sport science education.

Importantly, the study found that implementation of online learning and students' readiness were significant predictors of satisfaction, while institution type and demographic variables were not. This highlights the central role of pedagogical quality, lecturer competence, access to learning resources, and students' preparedness in influencing positive online learning experiences. The findings underscore that effective online learning in sport science depends less on whether an institution is public or private and more on how online learning is designed, delivered, and supported.

Given the practice-oriented nature of sport science, the moderate satisfaction levels reported across both sectors suggest that while online learning can adequately support theoretical instruction and assessment, it remains limited in fully addressing practical skill development. Therefore, future online and blended learning initiatives in sport science should prioritise instructional strategies that better integrate practical components, such as blended learning models, virtual simulations, video-based demonstrations, and structured feedback mechanisms.

Overall, this study contributes to the limited body of empirical research on online learning satisfaction within sport science education by providing a sector-based comparison in the

Malaysian context. The findings offer evidence-based insights for educators, institutions, and policymakers seeking to enhance the quality and effectiveness of online learning, particularly in disciplines that rely heavily on experiential and physical engagement.

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