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(IJMOE)**www.gaexcellence.com/ijmoe**LEARNING STYLE AND ITS IMPACTS ON LEARNING
FROM TERTIARY STUDENTS' PERCEPTION: A SURVEY**

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Abstract:

Negative educational outcomes have been linked to the incompatibility between learners' learning styles and teachers' teaching methods, such as decreased student engagement, reduced motivation to learn, and lower academic performance. Even though tremendous focus has been given to student-centered learning in tertiary education, limited research is available pertaining to the learning preferences of technical students on the East Coast of Malaysia. Therefore, this study examines students' preferred learning styles at a technical tertiary institution in Terengganu to better understand how learning styles vary across academic backgrounds. The study also investigates students' perceptions of the alignment of their favored learning methods and the lecturers' instructional strategies. A quantitative research approach was applied, whereby 112 students completed a Google Forms survey. The data then was analyzed using descriptive statistical analysis. The results reveal that the majority favored hands-on tasks, watching audiovisual content,

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and group collaboration, implying these approaches foster deeper learning. The study contributes to the literature by understanding preferred learning methods among technical tertiary students and how they respond pedagogical mismatch.

Keyword:

Impacts, Learning Style, Perception, Survey, Technical Tertiary Students



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Introduction

A mismatch between learners' learning styles and teachers' teaching methods has been linked with various educational outcomes. Among those reported are lower student engagement, lessened learning motivation, decreased learning satisfaction, struggle in comprehending course content, and declined academic performance (Asrifan, Cardoso & Vargheese, 2025; Costa & Reis, 2025; Mahmud, The & Azizan, 2026; Hauk & Gröschner, 2022; Clinton-Lisell & Litzinger, 2024). Each student has a unique way of learning, which is known as a learning style. It is the way a student chooses to absorb and process information, which influences study motivation and academic success (Sinaga, 2022). Higher education has its distinctive obstacles (Murire & Gavaza, 2025). Understanding students' learning styles certainly assists educators in employing effective student-centered teaching strategies, particularly for technical tertiary education, where experiential competencies are emphasized.

Fleming and Bonwell (2019) introduced the VARK learning model, which has been used throughout the years. The model focuses on four main learning styles: Visual, Aural, Read-and-write, and Kinesthetic (Quynh, 2024; Nouri & Addou, 2025; Shaher et al, 2025; Türker et al, 2026). Learners who like pictures, diagrams, and colors are known as visual learners, while those who like listening and discussion are called aural learners. Those who favor textual materials are considered read-and-write learners, and those who comprehend better through practical tasks are known as kinesthetic learners. These inclinations affect how they acquire knowledge, especially in technology-facilitated classrooms (Zheng et al., 2022) and project-based learning-focused environments (Mursid, Saragih & Hartono, 2022), which engineering and computer students commonly experience.

Previous studies have found that students' learning style preferences often depend on their background, gender, and chosen courses (Magulod, 2019; Supratman, 2023; Mohsenipouya, 2024). Visual and kinesthetic styles are especially popular among university students. However, some students may not recognize their own learning style, which can impact their engagement and academic results (Jafre et al., 2011). Despite the emphasis on student-centered learning in tertiary education, there is limited study on preferences of technical students in the East Coast of Malaysia.

Learning styles continue to be a significant component in understanding how tertiary students view and experience learning (Nutty & Barret, 1996). Different learning styles affect academic performance among tertiary students, and matching instructional strategies with students' preferred learning styles can improve competency and learning efficacy (Ying, 2024; Pascu, 2024). By knowing students' learning preferences, educators can tailor pedagogical strategies to the varied needs of tertiary students (Nuankaew et al., 2019). However, students with similar learning styles can still differ in their metacognitive abilities, suggesting that self-regulation and reflective thinking also support successful learning (Dewi & Wahyu, 2026). Therefore, relying solely on learning style matching is inadequate; educators should also encourage students' awareness of their own learning processes, so they can use adaptable strategies that go beyond individual preferences.

This study examines students' learning style preferences at a technical higher education institution to elucidate variations in academic backgrounds. It also explores students' perceptions of the compatibility of their learning styles and the lecturers' instructional techniques. The results are intended to contribute to the literature on learning styles among students from various engineering and computer science backgrounds at a technical university college. These findings may support educators in developing more inclusive teaching strategies and providing learning support tailored to students' learning tendencies. Alignment between teaching and learning styles normally leads to boosted academic achievement and an absorbing learning experience.

Methodology

This study aimed to identify patterns in tertiary students preferred and perceived learning styles and their alignment with teaching methods. It also aimed to determine the study objective within a quantitative research design conducted at a private higher education institution (HEI) in Terengganu, Malaysia. Convenience sampling was used to select readily accessible respondents from diverse academic programmes at the HEI. Their participation was voluntary, and informed consent was obtained before respondents completed the questionnaire. Confidentiality and anonymity were maintained throughout the data collection process.

Data was collected using a structured questionnaire administered online via Google Forms from June to July 2025. The study adopted and adapted two previous researches which are "The Preferences of Student's Learning Method Based on Course, Gender and Age: Visual, Audio, Reading & Kinesthetic(VARK)" by Natasha Dzulkalnine et al. (2024), and "A Study on The Learning Style Preferences of Undergraduate Quantity Surveying Students in The Malaysian University" by Ooi, Loo, and Toh (2025). Both studies used Neil Fleming's VARK learning style model, categorizing students' preferences into four modalities: Visual (V), Aural (A), Read/Write and Kinesthetic(K). The responses were assessed using a 6-point Likert scale ranging from 1 for strongly disagree to 6 for strongly agree. All gathered responses were

analyzed using descriptive analysis which are frequency, percentage, mean, and standard deviation.

Table 1 summarizes results from items A1-A4 in Section A, which gathered data on respondents' demographic characteristics. From the total respondents of 112, males were 54.5% (n=61), and females were 45.5% (n=51). The age group was distributed as follows: 42% (f=7) were 18 to 19 years, 53.6% (f=60) were 20 to 25 years, 0.9% (f=1) were 26 to 30 years, and 3.6% (f=4) were 31 years and above, indicating diverse age categories. The majority of respondents were Degree students (50.9%, f=57), followed by Foundation students (33.9%, f=38). Diploma students accounted for 12.5% (f=14), Master's students for 1.8% (f=2), and there was one PhD student (0.9%). Respondents were also represented by three faculties: 34.8% (f=39) from the Department of Foundation, 49.1% (f=55) from the Faculty of Computer Technology and Media Creative, and 16.1% (f=8) from the Faculty of Engineering Technology.

Table 1: Respondents' Demographic Characteristics (Items A1-A4)

Demographic	f	%
<i>A1. Gender</i>		
Male	61	54.5
Female	51	45.5
<i>A2. Range of Age</i>		
18-19 years old	47	42
20-25 years old	60	53.6
26-30 years old	1	0.9
31 years and above	4	3.6
<i>A3. Level of Program</i>		
Foundation	38	33.9
Diploma	14	12.5
Degree	57	50.9
Master	2	1.8
PhD	1	0.9
<i>A4. Faculty</i>		
JPA	39	38.4
FKMPT	55	49.1
FTK	18	16.1

N=112, f=frequency and %=percentage

Results and Discussion

This section presents the results of items B1 to B4 in Section B, used to examine students' learning preferences. This is followed by items C1 to C6 from Section C, used to gauge how well their learning styles match with lecturers' teaching strategies.

Student Preferred Learning Styles

Table 2 presents the results from Section A, items B1 to B4. Item B1 ("I prefer to learn through maps, diagrams, charts, graphs and other visual aids") reflects a visual learning style; item B2 ("I prefer to learn through listening to lectures, discussions and spoken instructions") reflects

an auditory learning style; item B3 (“I prefer to learn through listening to reading textbooks, articles, and written instruction”) reflects a reading learning style and item B4 (“I prefer to learn through hands-on activities, experiments and practical tasks”) reflects a kinesthetic learning style. Average values were translated according to the scale: 0 to 1.00 for Strongly Disagree, 1.01 to 2.00 for Disagree, 2.01 to 3.00 for Somewhat Disagree, 3.01 to 4.00 for Somewhat Agree, 4.01 to 5.00 for Agree, 5.01 to 6.00 for Strongly Agree. The aim of using a 6-point Likert scale is to reduce bias and improve reliability (Nattapong, 2025).

Total average values for favored learning styles range from 4.24 to 5.09, while standard deviations range from 0.940 to 1.300. The kinesthetic learning style has the highest mean score (mean=5.09, SD=1.210), followed by the visual (mean=4.98, SD=0.940), and the auditory (mean=4.75, SD=1.150). Reading has the lowest mean value (mean=4.24, SD=1.300). Although engineering and technical students usually favoured the kinesthetic style, some preferred other learning styles. Therefore, lecturers should use a range of strategies interchangeably to match students’ preferred learning styles.

Table 2: Preferred Learning Styles (Items B1-B4)

Item	Strongly disagree		Disagree		Somewhat Disagree		Somewhat Agree		Agree		Strongly agree		Mean	Standard Deviation
	f	%	f	%	f	%	f	%	f	%	f	%		
B1	4	3.6	0	0	7	6.3	21	18.8	41	36.6	39	34.8	4.98	0.940
B2	2	1.8	4	3.6	8	7.1	27	24.1	33	29.5	38	33.9	4.75	1.150
B3	4	3.6	14	12.5	19	17	33	29.5	25	22.3	17	15.2	4.24	1.300
B4	2	1.8	1	0.9	1	0.9	15	13.4	27	24.1	66	58.9	5.09	1.210

*f=frequency and %=percentage

Student Preferred Learning Methods, Tools, and Habits

Table 3 summarizes respondents' preferred learning methods, tools, and habits shown in items B5 to B8. For item B5, which inquired about preferred methods for learning new material, the highest-ranked option was watching audiovisual content (70.5%, f=79), followed by practical activities (68.8%, f=77), listening (50%, f=56), and reading (27.7%, f=31). The least favored methods were taking notes and playing game activities, with only one respondent each (0.9%).

Item B6 gauges useful learning aids from the respondents’ standpoint. Most respondents opted for videos (64.3%, f=72) and group discussions (63.4%, f=71). Coming next are mobile apps (51.8%, f=58) and books (34.8%, f=39). Only one respondent identified being involved in activities and using ChatGPT as the most useful tool, each at 0.9% (f=1). The results confirmed a preference for digital and interactive learning tools over traditional ones.

Item B7 determines respondents’ preference for working individually or in groups. Most respondents (75%; f=84) chose individual study over group study for certain courses. Only 13.4% (f=15) consistently preferred group learning, while 7.1% (f=8) favored individual learning. The remaining 4.5% (f=5) expressed no discernible favorite. Hence, learning tendencies vary according to the courses taken each semester. For instance, an event management course requires collaboration to complete coursework and achieve a high grade. In contrast, public speaking or experiment-based courses demand strong individual

performance. Therefore, educators should consider a variety of course assessments to accommodate diverse learning choices.

Item B8 appraises respondents' perspectives on diagrams or mind maps during study sessions. Most respondents, 53.6% (f=60), indicated regular use of these tools. Additionally, 22.3% (f=25) often use them, and 11.6% (f=13) always use them. While 8.0% (f=9) rarely use them, and 4.5% (f=5) never use them. The results imply that diagrams and mind maps were recognized as effective aids for knowledge acquisition.

Table 3: Preferred Methods, Tools and Habits (Items B5-B8)

Item	f	%
<i>B5. My favorite way to learn new things is:</i>		
Watching	79	70.5
Listening	56	50
Reading	31	27.7
Doing	77	68.8
Notes	1	0.9
Playing on game versions	1	0.9
<i>B6. Learning tools that help the most is:</i>		
Books	39	34.8
Videos	72	64.3
Group Discussions	71	63.4
Mobile Apps	58	51.8
Joined activities & mix with others	1	0.9
ChatGPT	1	0.9
<i>B7. I prefer learning alone or in a group</i>		
Alone	8	7.1
In a Group	15	13.4
Depends on the subject	84	75.0
No preference	5	4.5
<i>B8. I often use diagrams or mind maps when studying</i>		
Always	13	11.6
Often	25	22.3
Sometimes	60	53.6
Rarely	9	8.0
Never	5	4.5

*f=frequency and %=percentage

Learning Styles Matching Teaching Methods

Items C1 to C4 in Section C were used to analyze students' views on the compatibility of their learning styles with the lecturers' teaching methods. Meanwhile, items C5 and C6 were utilized to determine their stance on the incompatibility.

Table 4 presents the responses from items C1 to C4. The average scores ranged from 4.72 to 5.16, with standard deviations ranging from 1.070 to 1.150. Most respondents believed that

“students with different learning styles learn in different ways – item C4” (mean=5.16, $SD=1.070$) and reported greater enjoyment of learning (item C3) when lecturers’ instructional methods aligned with their preferred learning style (mean=5.07, $SD=1.080$). They also “*feel more confident - item C2*” when studying using their favored learning strategies, with a mean value of 4.86 ($SD=1.090$), and they perceived the learning mode as enabling them to “*get better grades – item C1*” (mean=4.72, $SD=1.150$). Thus, learning style awareness enhances the learning process and, in turn, improves academic performance.

Table 4: Matching Learning Styles with Teaching Methods from items C1-C4

Item	Strongly disagree		Disagree		Somewhat Disagree		Somewhat Agree		Agree		Strongly agree		Mean	Standard Deviation
	f	%	f	%	f	%	f	%	f	%	f	%		
C1	4	3.6	2	1.8	5	4.5	27	24.5	46	41.1	28	25.0	4.72	1.150
C2	1	0.9	4	3.6	5	4.5	23	20.5	40	35.7	39	34.8	4.86	1.090
C3	2	1.8	1	0.19	6	5.4	23	20.5	29	25.9	51	45.5	5.07	1.080
C4	2	1.8	1	0.9	5	4.5	16	14.3	33	29.5	55	49.1	5.16	1.070

*f=frequency and %=percentage

Table 5 tabulates the results for items C5 and C6 in Section C, indicating the extent to which students acknowledged their learning struggles due to a mismatch between instructional techniques and learning mode. Most respondents selected “*sometimes*” (61.6%, $f=69$), next “*often*” (17.9%, $f=20$), “*rarely*” (10.7%, $f=12$), and “*always*” (6.3%, $f=7$) for item C5. However, several respondents (3.6%, $f=4$) felt that they “*never found it hard to learn because the teaching style did not match*” their learning style. These results indicate that many respondents faced occasional hiccups due to a mismatch between lecturers’ instructional strategies and their preferred learning modes, so this issue should be resolved to promote a positive and successful knowledge acquisition process.

All respondents reacted differently when problems emerged, as shown in the table for item C6. Most of them resorted to self-study (42.9%, $f=48$), while others chose to amend their study techniques (23.1%, $f=20$) or request information (17%, $f=19$). Some became disinterested in learning altogether (15.2%, $f=17$). A small proportion (1.8%, $f=2$) were versatile and settled for self-learning afterwards. Most respondents assumed their own responsibility for autonomous knowledge acquisition, while others regulated learning strategies by adopting various coping mechanisms to narrow the disparity. However, some respondents disagreed, highlighting issues dealing with the misalignment. Such concerns should be addressed to prevent students from losing interest in learning and becoming demotivated to perform in any academic assessments.

Table 5: Learning Style Impacts (Items C5-C6)

Item	f	%
C5. I found it is hard to learn because the teaching style didn’t match my learning style.		
Never	4	3.6
Rarely	12	10.7

Sometimes	69	61.6
Often	20	17.9
Always	7	6.3
<i>C6. When the teacher doesn't use my preferred learning style, I will:</i>		
Try to adapt	20	23.1
Ask questions	19	17.0
Study on my own later	48	42.9
Lose interest	17	15.2
Try to adapt and study on my own later	2	1.8

*f=frequency and %=percentage

Conclusion

The study investigated students' learning style preferences using the VARK framework and explored their perceptions of how well their preferred learning styles matched lecturers' instructional approaches. The results showed that the kinesthetic learning style was the most preferred, followed by visual and auditory learning, while read-and-write was the least preferred. The respondents also showed a strong preference for interactive, technology-supported learning, particularly videos, hands-on activities, and group discussions. Additionally, students largely believed that learning was more gratifying and that they became more self-assured when lecturers utilized teaching methods that supported their preferred learning styles. Nonetheless, most respondents also reported sporadic struggles when teaching strategies did not align with their learning preferences, occasionally resorting to independent learning or adjusting their learning mode. These results demonstrate that, despite distinct learning preferences, technical students are adaptable learners who benefit from varied pedagogical approaches.

The results further highlight that a perceived discordance between learning styles and instructional strategies may limit students' engagement, self-confidence, and learning, rather than exclusively their academic achievement. Several respondents reported that instructional methods were frequently misaligned, making learning more challenging and, in some cases, demotivating them. Nonetheless, many students were persistent and either studied class materials independently or adjusted to assorted teaching practices. These results illustrate the importance of applying comprehensive, multiple teaching methods that integrate visual foundations, hands-on activities, cooperative learning, and technology-based teaching methods. Instead of relying mainly on learning-style matching, lecturers should use diverse pedagogical strategies that accommodate learner diversity while nurturing students' flexibility, self-coordinated learning, and metacognitive attentiveness. Such a tactic is especially pertinent in technical higher education, where students are expected to acquire both theoretical comprehension and practical competencies.

The novelty of the study lies in its investigation of both students' preferred learning styles and their perceptions of the complementarity between learning styles and teaching methods within a Malaysian technical university college, a topic that has received little scholarly attention. The findings extend the literature by researching how students observe instructional matching and how they respond to such incompatibility, unlike numerous previous studies that mainly explore prevalent learning styles or examine the association between learning styles and academic performance. The findings offer context-driven verification that students in

engineering- and computing-related courses prefer experiential and visually focused learning and indicate amended behaviors in response to pedagogical mismatch. These understandings contribute to the expanding discourse on learner-oriented teaching practices by recommending that effective pedagogy move beyond accommodating individual learning styles and instead adopt adaptable, multi-method, and comprehensive teaching strategies. Future studies should use larger, more representative samples from various tertiary institutions and integrate inferential analyses or longitudinal studies to investigate how the perceived matching of teaching methods affects gradual increases in student participation, autonomous learning, and academic achievement.

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