

## TVET STUDENTS' LEARNING HABITS AND EXPECTATIONS: A PRE-IMPLEMENTATION STUDY OF FLIPPED CLASSROOM IN A TECHNICAL COURSE

*Tabiat dan jangkaan pembelajaran pelajar TVET: kajian pra-pelaksanaan bilik darjah terbalik dalam kursus teknikal*

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### Abstract

This study explores the learning habits, digital readiness, and expectations of Technical and Vocational Education and Training (TVET) students as a preliminary step toward the implementation of a flipped classroom approach in a technical course. The study employed a quantitative, cross-sectional survey among 83 UniKL MICET students enrolled in a technical course to assess their learning habits, time management, motivation, and readiness for the flipped classroom model. Data were collected through a structured questionnaire, with ethical protocols ensuring voluntary participation and anonymity. The findings revealed that although the students belong to Generation Z and are digital natives, many still exhibit traditional, instructor-dependent learning habits. A majority rely heavily on lecturer-provided materials, with limited pre-class preparation. However, increasing use of AI tools (94%) and online materials (69%) indicates a growing openness toward digital learning. Despite low prior awareness of the flipped classroom concept, most students (73.5%) showed a willingness to engage in pre-class tasks, though concerns about workload persist. Overall, the results indicate that TVET students possess moderate readiness for flipped classroom implementation, highlighting the need for approaches that blend traditional methods with active, technology-based, student-centered learning.

**Keywords:** TVET students, flipped classroom, learning habits, digital readiness, pre-implementation study

### Abstrak

*Kajian ini meneroka tabiat pembelajaran, kesediaan digital dan jangkaan pelajar Pendidikan dan Latihan Teknikal dan Vokasional (TVET) sebagai langkah awal ke arah pelaksanaan pendekatan kelas terbalik dalam kursus teknikal. Kajian ini menggunakan tinjauan kuantitatif dan keratan rentas dalam kalangan 83 pelajar*

UniKL MICET yang mendaftar dalam kursus teknikal untuk menilai tabiat pembelajaran, pengurusan masa, motivasi dan kesediaan mereka untuk model kelas terbalik. Data dikumpulkan melalui soal selidik berstruktur, dengan protokol etika yang memastikan penyertaan sukarela dan anonimiti. Penemuan mendedahkan bahawa walaupun pelajar tergolong dalam Generasi Z dan merupakan natif digital, ramai yang masih mempamerkan tabiat pembelajaran tradisional yang bergantung kepada pengajar. Majoriti sangat bergantung pada bahan yang disediakan oleh pensyarah, dengan persediaan pra-kelas yang terhad. Walau bagaimanapun, peningkatan penggunaan alatan AI (94%) dan bahan dalam talian (69%) menunjukkan keterbukaan yang semakin meningkat terhadap pembelajaran digital. Walaupun kesedaran awal yang rendah tentang konsep kelas terbalik, kebanyakan pelajar (73.5%) menunjukkan kesediaan untuk terlibat dalam tugas pra-kelas, walaupun kebimbangan tentang beban kerja masih merisaukan. Secara keseluruhannya, keputusan menunjukkan bahawa pelajar TVET mempunyai kesediaan sederhana untuk pelaksanaan kelas terbalik, menonjolkan keperluan untuk pendekatan yang menggabungkan kaedah tradisional dengan pembelajaran aktif, berasaskan teknologi dan berpusatkan pelajar.

**Kata kunci:** Pelajar TVET, kelas flipped, tabiat pembelajaran, kesediaan digital, kajian pra-pelaksanaan

## 1.0 INTRODUCTION.

Progress depends on education, a pursuit that Islam honors as a lifelong duty for every believer (Ibn Majah, from Anas bin Malik). However, while national policies and broad TVET background are well-documented, the core problem lies in fragmented delivery and inconsistent pedagogical implementation. In today's globalized, knowledge-driven society, education equips individuals with essential skills for personal and societal advancement (Nwachukwu, 2024). To meet Malaysia's target of 30% high-skilled workforce by 2030 (Hussain et al., 2021). Technical and Vocational Education and Training (TVET) plays a central role in producing industry-ready workers (Abd Karim & Mustapha, 2022). Despite government allocations of RM6.7 billion to seven key ministry (Amin et al., 2023) and alignment with the Shared Prosperity Vision 2030 and SDG 4 and 5 (Abd Hamid et al., 2023; Hong et al., 2022), TVET delivery remains fragmented across over a dozen ministries and 1,000 institutions with varying standards (Aziz, & Subramaniam, 2023).

Therefore, work-based learning and technology integration are essential (Tshong & Yasin, 2023), requiring flexible, industry-based curricula (Ridzuan & Abd Rahman, 2022) Within Malaysia's higher TVET institutions, such as the Malaysia Technical University Network (MTUN) (Abd Hamid et al., 2023) and Universiti Kuala Lumpur (UniKL), the UniKL HTVET model emphasizes hands-on learning (60%), the "2u1i" mode, and the "Teaching Factory" (Ahmad & Rosnan, 2024; Shah Hashim, 2016; Shaikh Ali et al., 2024). To address the fragmentation and actively engage students, innovative teaching strategies are needed—one promising strategy being the flipped classroom.

### 1.1 Flipped Classroom as a Pedagogical Innovation for TVET Students.

The flipped classroom model has emerged as a powerful innovation in higher education and TVET. Evidence shows students in flipped classrooms demonstrate higher academic achievement compared to traditional methods (Nja et al., 2022), building positive attitudes through self-directed study, collaboration, and problem-solving. It supports self-regulation and constructivist learning, shifting to active student-centered learning where instruction (e.g., recorded lectures, online readings) occurs

outside the classroom. A key challenge is students' adaptation to greater responsibility for planning time, engaging with pre-class materials, and arriving prepared for problem-solving activities (Sointu et al., 2023).

Technology enables flipped learning via learning management systems like Moodle (Baig & Yadegaridehkordi, 2023), while group work, presentations, and discussions mirror workplace collaboration (Barranquero-Herbosa et al., 2022). A well-designed flipped classroom fosters autonomy and strengthens employability skills, making it highly relevant for TVET (Cho et al., 2021; Lu et al., 2023). Successful implementation depends on mediating factors such as students' self-regulation, teacher preparedness, assessment strategies, and ongoing feedback (Oudbier et al., 2022).

Existing Malaysian studies have examined flipped classroom readiness among TVET students, but they remain limited in scope. Mokmin et al., (2019) found that while most students recognized the model's benefits and had access to supporting technologies, challenges persisted due to inadequate training and content development guidance. Similarly, Ruslan et al., (2022) reported that most of students agreed pre-recorded videos aided their preparation, and the flipped approach yielded better performance (39.29% scored A or A-) than conventional delivery (19.82%). These findings confirm positive attitudes and technological readiness among Malaysian TVET students, yet they focus predominantly on perceptions and performance outcomes rather than pre-implementation learning habits. Therefore, no study has systematically examined students' basic habits, time management, motivation, and expectations before introducing the flipped model. This gap is particularly significant in the Malaysian higher TVET context, where frameworks such as the UniKL HTVET model emphasize 60% hands-on learning and industry integration.

Recognizing this gap in fragmented TVET delivery and inconsistent flipped classroom readiness, a pilot study was undertaken to examine TVET students' learning habits, time management, motivation, and expectations, thereby informing the full implementation of the flipped classroom model.

## **2.0 METHODOLOGY.**

This study was conducted at UniKL MICET using a descriptive, cross-sectional survey design to examine students' learning habits, time management, motivation, and expectations prior to the implementation of flipped classrooms in technical courses.

As this was a pre-implementation pilot needs assessment intended to inform course redesign rather than to validate psychometric instruments or test hypotheses, inferential statistical procedures and reliability tests (Cronbach's alpha) were not used in this study (Hertzog, 2008). This design was selected to gain a clear understanding of students' readiness and perceptions, thereby providing actionable insights to guide course redesign before introducing the flipped classroom model.

### **2.1 Target Population and Sampling**

The target population for this pilot study consisted of the students enrolled in the Bachelor of Food Safety and Quality Technology programme at UniKL MICET, specifically those taking the subject Process Instrumentation and Control during the Semester 2/Year 1 session.

87 students enrolled in this subject were invited to participate. Since the total number of students was fewer than 250, a census approach was used, where every student in the course was given the opportunity to respond.

## 2.2 Research Instrument

A structured questionnaire was self-developed based on literature on flipped classroom readiness and TVET learning behavior. The questionnaire underwent face validity and content validity through review by two experienced TVET lecturers from UniKL MICET. Experts evaluated the clarity, relevance, and comprehensiveness of the items. Revisions to wording and item order were made based on their feedback prior to distribution. Data were analyzed using Microsoft Excel because statistical software such as SPSS or Jamovi was not required for this descriptive pilot study. According to (Pallant, 2022), descriptive analysis is appropriate when the research objective is to summarize sample data rather than predict relationships or compare groups. Therefore, the following descriptive statistics were used:

Percentages (%) – to summarize characteristics and Yes/No responses

The survey consisted of five sections:

- a) Demographics of student: age and prior education background.

Sample items:

Demography of Students                      2000,2001,2002,2003,2004,2205

- b) Current Learning Habits: Preferred learning methods, frequency of pre-class preparation, and use of external resources including AI tools.

Sample items:

Current learning habits                      I like to listen to the teacher's explanation or discuss with friends to better understand.  
I like to look at pictures, charts, or videos to understand the content of the lesson.  
I do like to do activities, experiment and practical exercise myself  
I like to use a computer, phone or online learning apps to study

- c) Readiness for Flipped Classroom: Familiarity with concept, willingness to participate, perceived challenges (time management and motivation).

Sample items:

willingness to engage in pre-class preparation      Yes or No

This study captures student preferences for given options by calculating the collective percentage for each choice, providing a purely descriptive overview of responses without using a Likert scale.

## 2.3 Ethical Consideration

Participation in this study was entirely voluntary, and informed consent was obtained from all respondents prior to completing the survey. Data were collected anonymously, ensuring that no personal identifiers were recorded or disclosed. The results will be reported only in aggregate form and will be used solely for the purpose of improving teaching practices and for research publication.

### 3.0 RESULT AND DISCUSSION.

#### 3.1 Student Demography

Figure 1 presents the demographic findings based on two key aspects: age and previous educational background. These factors strongly influence students' learning characteristics and readiness for new pedagogical approaches such as the flipped classroom. The demographic composition of the respondent's shows that all students fall within the age range of 20 to 25 years old (year 2000 to 2005), positioning them within Generation Z (Alruthaya et al., 2021; Iftode, 2019).

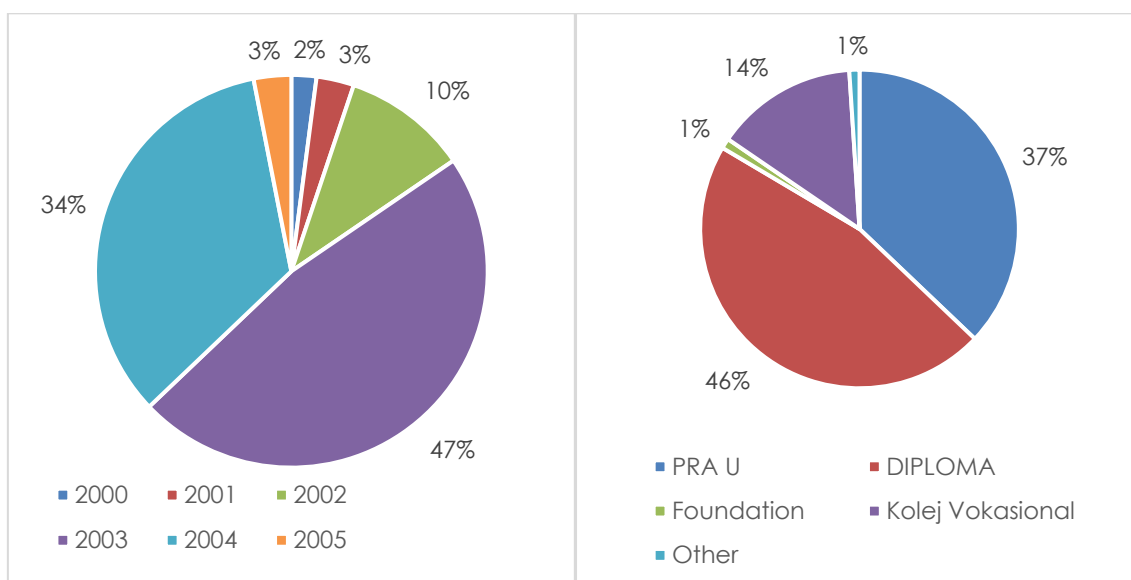


Figure 1. Demographic istribution by year of birth and prior educational background

According to Alruthaya et al., (2021), Generation Z are digital natives raised with technology, who are generally comfortable with tech-driven, visual, and interactive learning. This generation's adaptability to current technology aligns well with the flipped classroom model, which emphasizes digital materials, interactive videos, and collaborative learning activities. Therefore, the findings indicate that all students in this class belong to Generation Z, making them naturally adaptable with the technological fluency and flexibility needed for a flipped classroom environment.

From the perspective of educational background, the students can be categorized into two main groups: those from pre-university (STPM or foundation) programs (37%), diploma programs (polytechnic or university (46%) and Kolej Vokasional (14%)) backgrounds. These two groups have undergone distinct curricular systems, each emphasizing different learning orientations and assessment structures.

Students from STPM or pre-university backgrounds are typically accustomed to academic and theoretical learning, focusing on conceptual understanding and centralized examinations, with limited exposure to hands-on activities. In contrast, diploma students from polytechnics or universities experience a balance between theory and practice, often engaging in laboratory sessions, coursework, continuous assessments, and industrial training. Meanwhile, students from Kolej Vokasional (KV) backgrounds are more skill-oriented, having been trained in competency-based curricula emphasizing practical application over theoretical study (Samad et al., 2017). These diverse educational experiences create a heterogeneous learning environment. This is shaped by each institution's focus, which affects learning styles and assessment methods, with some emphasizing psychomotor skills over cognitive development.

Therefore, the demographic diversity in the classroom calls for a more adaptive flipped classroom approach, with learning materials, pre-class tasks, and in-class activities tailored to accommodate learners from varied backgrounds.

### 3.2 Learning habits: Learning Preferences

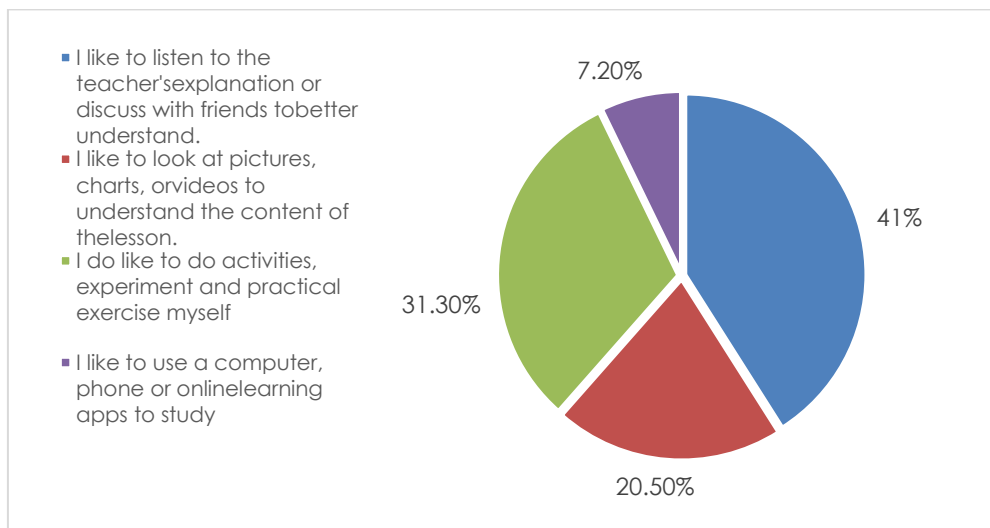


Figure 2 Preferred learning methods used by students when understanding a new topic.

Figure 2 reveals that most students still exhibit teacher-centered learning habits, particularly when acquiring new knowledge. About 41% of respondents preferred listening to the teacher's explanation or discussing with peers to better understand new concepts. This suggests that while students value discussion, they still rely on direct instruction and structured guidance, typical of TVET learners who depend on demonstrations for practical subjects.

Meanwhile, 31% of the students preferred learning through hands-on activities. A smaller proportion, 20.5%, indicated that they learn better through visual materials such as pictures and charts, while only 7.2% reported using digital tools such as computers, phones, or online applications.

Although students are digital natives, some are still less comfortable using technology for learning and tend to rely on traditional methods. Contrary to the claim that digital natives possess uniformly superior digital skills (Koumachi, 2019), findings from (Olaitan & Mavuso, (2022), show that some students are less comfortable with technology-enhanced learning. It can be understood in relation to educational psychology, which states that prior experiences significantly influence current learning tendencies. Specifically, primary and secondary schools emphasize conventional pedagogical approaches. This fosters learning schemas that predispose students towards familiarity and perceived efficacy with traditional methods. This is consistent with the view that digital natives are also strongly influenced by opportunity, prior experiences, and psychological factors, suggesting that they do not form a rigidly digitally defined group as previously assumed (Wang et al., 2013).

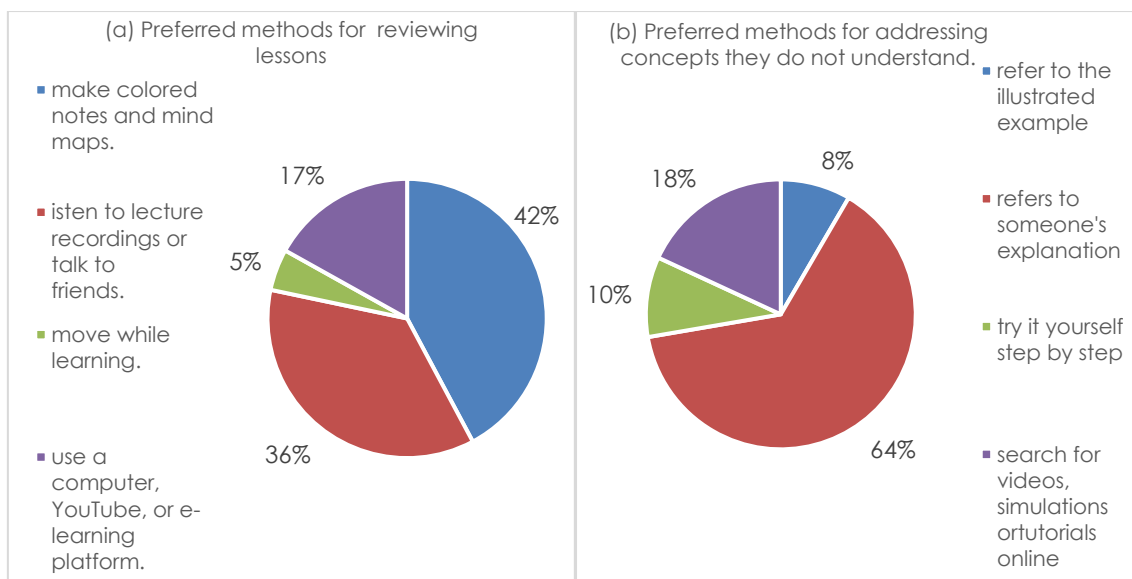


Figure 3 Students' preferred methods for (a) reviewing lessons and (b) addressing concepts they do not understand.

In terms of review and revision strategies (Figure 3 (a)), a majority (42.2%) of students reported making colored notes or mind maps, which indicates a preference for visual organization and self-structuring of content. Another 36.1% relied on listening to recorded materials, demonstrating the importance of auditory reinforcement in consolidating knowledge. As reported earlier, although students belong to the digital-native generation, only 16.7% used YouTube or other online videos, indicating limited engagement with digital resources for self-review.

A similar trend is shown in Figure 3(b), where only 18.1% used videos or AI tools (such as ChatGPT, DeepSekk, Gemini, etc.) when facing difficult concepts, reflecting growing awareness of digital learning aids, though their use remains secondary to traditional methods. Most students (63.9%) chose to listen again to explanations or discuss with others, showing a strong dependence on social and instructor-mediated learning support. A smaller group (9.6%) preferred to solve problems step-by-step independently, reflecting a minority of self-regulated learners capable of analytical problem-solving without external input.

Overall, the findings indicate that the students are shifting from teacher-led to more self-directed learning but still need structured support. The flipped classroom model can serve as a bridge to enhance digital literacy, self-regulation, and active engagement while retaining valued social and practical elements.

### 3.3 Learning habits: Learning Approaches

Figure 4 (a) shows a strong dependence on lecturer-provided materials, with 69.9% of students relying mainly on lecture notes uploaded in the Virtual Learning Environment (VLE). This highlights that while digital platforms are being used, they primarily serve as repositories for instructor-driven content rather than spaces for exploration or autonomous learning. Only 24% of students reported using AI tools as part of their study process, while others occasionally used books or Google searches. Figure 4 (b) reveals important insights into the learning habits and readiness of TVET students for a flipped classroom environment. Despite being digital natives, many students still display traditional learning behaviors. A majority of respondents (55.4%) reported that they did not read the textbook before class, indicating a low level of pre-class preparation. This finding may be attributed to the long-established teacher-centered culture,

where students are accustomed to structured instruction and guided materials rather than independent exploration (Seel, 2003).

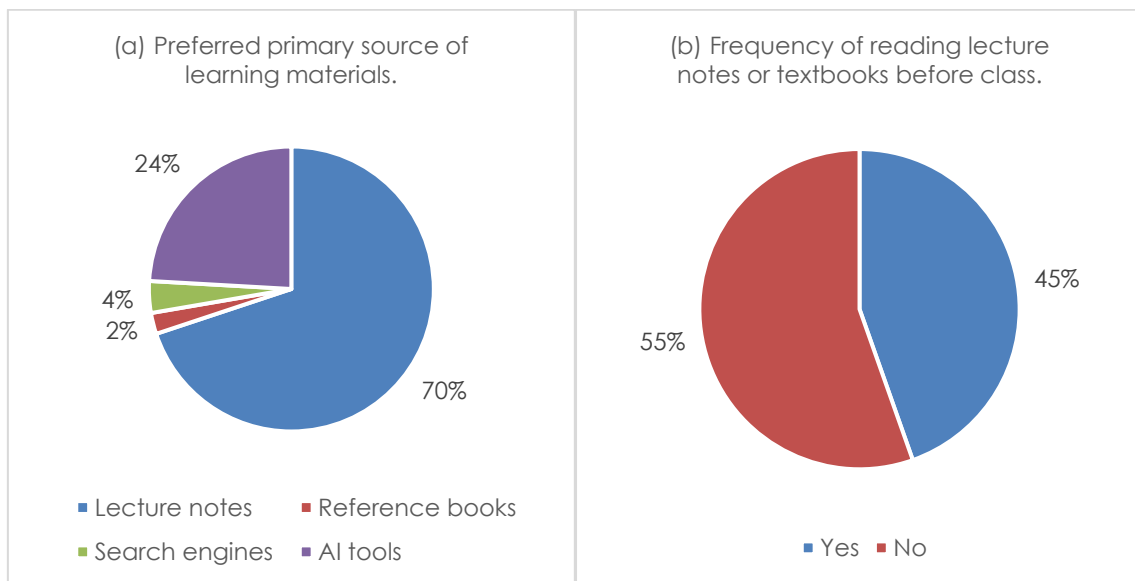


Figure 4 Students' learning approaches: (a) preferred primary source of learning materials, and (b) frequency of reading lecture notes or textbooks before class.

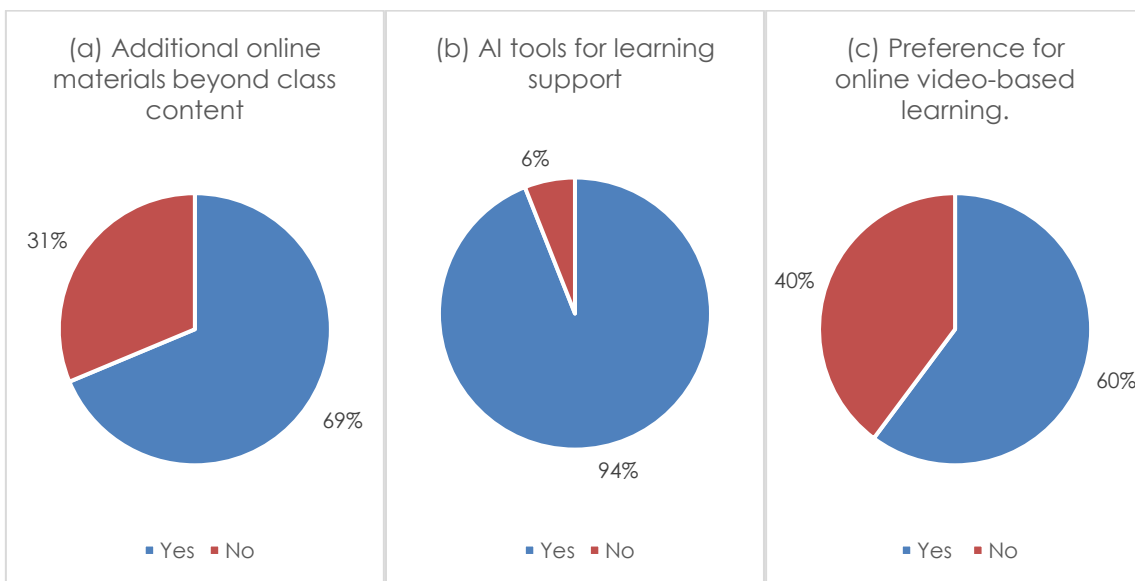


Figure 5 Students' use of supplementary learning resources: (a) additional online materials beyond class content, (b) AI tools for learning support, and (c) preference for online video-based learning.

However, Figure 5 shows that students actively seek supplementary learning resources from digital platforms. As illustrated in Figure 5(a), 69% of students reported using online materials beyond class in addition to lecturer-provided notes. AI tools emerged as the most utilized resource, with 94% of students using them to support their studies. This indicates that, although traditional learning habits persist due to previous educational experiences, as digital natives, students are increasingly integrating technology into their learning practices. Furthermore, as shown in Figure 5(c), around 60% of students prefer using YouTube or other digital content for learning, reflecting their inclination toward visual and interactive formats that align well with the flipped classroom approach.

This reflects a positive attitude toward technology-enhanced learning and suggests that students are comfortable accessing multimedia resources outside traditional classroom materials.

### 3.4 Readiness of Flipped Classroom

Figure 6 illustrates students' readiness and perceptions toward the flipped classroom, including their prior awareness of the concept, willingness to engage in pre-class preparation, perceptions of increased workload, and views on completing pre-lecture handouts.

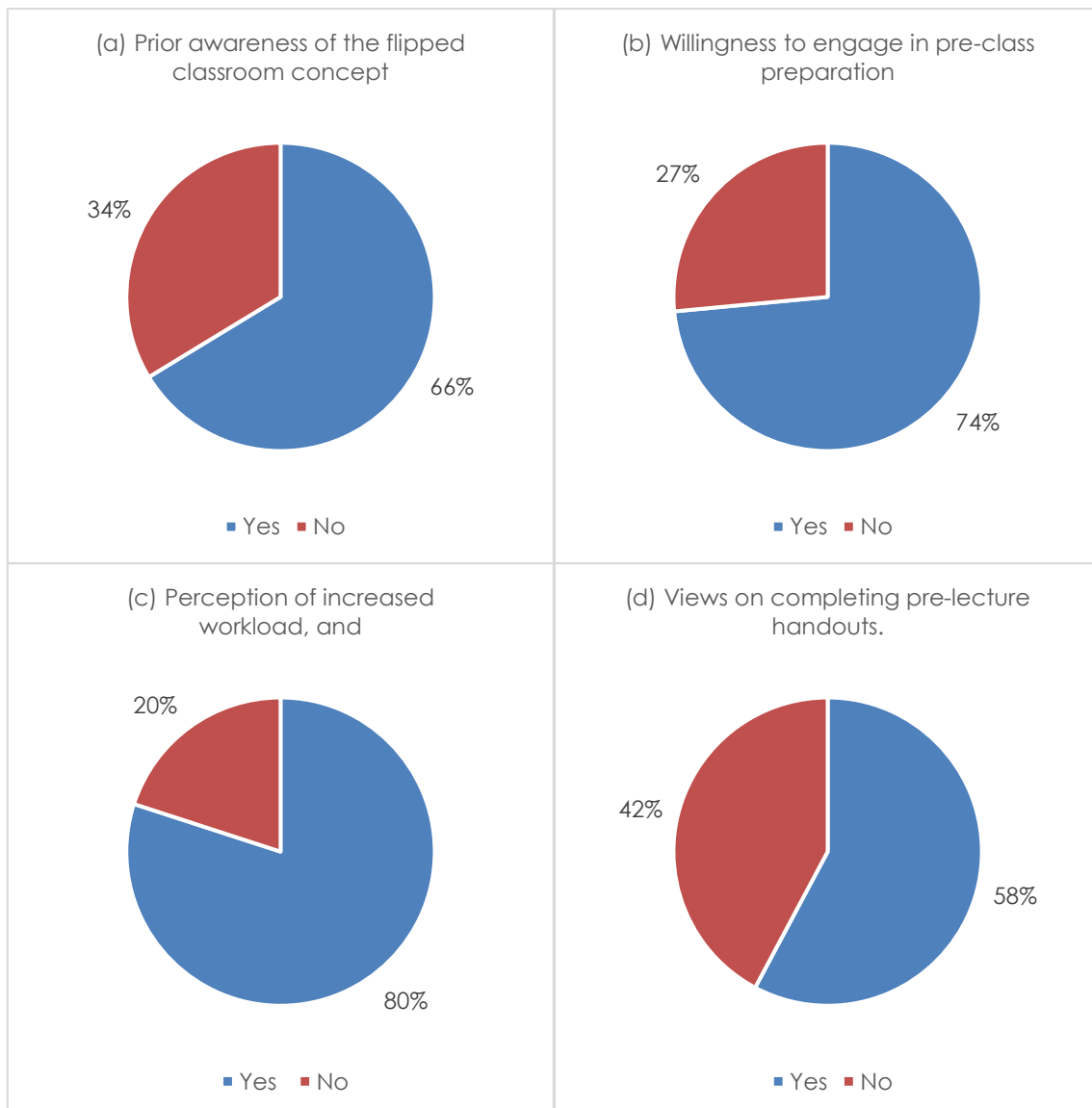


Figure 6 Students' readiness and perceptions toward the flipped classroom: (a) prior awareness of the flipped classroom concept, (b) willingness to engage in pre-class preparation, (c) perception of increased workload, and (d) views on completing pre-lecture handouts.

The findings reveal that while most the students have limited prior exposure to the flipped classroom model. A large majority of respondents (66.3%) reported that they had never heard of the flipped classroom concept before this study. This supports previous findings that the long-established teacher-centered culture remains dominant (Esmail et al., 2024). Therefore, careful planning and orientation are

essential before introducing the flipped classroom approach to ensure students clearly understand its purpose and structure.

Despite this low level of awareness, the results show encouraging signs of adaptability. A substantial proportion (73.5%) of respondents (Figure 6 (b)) indicated that they are willing to spend time before class to watch videos or read guided notes. It shows students are motivated to engage in pre-class preparation when they perceive it as beneficial to their understanding.

However, workload perception in Figure 6 (c) also emerged as a critical factor. A significant majority (79.5%) believed that a flipped classroom would increase their workload compared to traditional lectures. This perception aligns with previous studies showing that students often view pre-class preparation as an added burden, mainly due to limited time-management skills for self-paced learning (Tseng & Pai, 2012). Interestingly, this concern highlights the need to balance pre-class materials and emphasize the long-term benefits of active learning. Notably, 57.8% of students did not find pre-lecture handouts burdensome. This suggests that students' willingness may stem from a teacher-centered learning culture, where learners are accustomed to complying with explicit instructions from the instructor rather than initiating self-directed learning. This pattern aligns with findings by Abd Ghani et al. (2014) and Lee et al. (2020), which indicate that Malaysian students are often socialized in didactic, lecturer-driven environments that emphasize structured guidance over independent exploration.

Overall, the findings indicate a moderate level of readiness. Although students have limited prior knowledge of the flipped classroom, they demonstrate motivation and willingness to participate. However, concerns about workload highlight the need for gradual implementation and supportive guidance to facilitate the transition from teacher-centered to student-centered learning.

#### 4.0 CONCLUSION.

This pilot study provides important insights into the learning habits, motivation, and readiness of TVET students toward the flipped classroom model. The findings reveal that while students demonstrate strong digital exposure as Generation Z learners, many still exhibit traditional, teacher-centered learning behaviors, relying heavily on provided materials and structured guidance.

Nevertheless, encouraging trends were observed. Majority of students actively use online resources and AI tools to supplement their learning, showing growing digital adaptability. Although most had limited prior awareness of the flipped classroom, they expressed high willingness to engage in pre-class activities when the benefits to understanding were clear.

However, perceptions of increased workload and dependency on teacher instructions highlight the need for gradual, well-supported implementation. Structured pre-class tasks, clear communication of learning objectives, and guided digital engagement are essential to ensure a smooth transition. This indicates the level of readiness is in moderate. This indicates a moderate level of readiness.

Hence, the study fulfills its aim by identifying key behavioral and motivational factors that must be addressed before full adoption. These perceptions will guide the design of a tailored flipped classroom strategy, which aligns with TVET students' learning culture by combining traditional methods with active, technology-based, student-centered learning.

Future studies should evaluate the effectiveness of flipped classrooms in TVET based on positive readiness indicators. For example, flipped classrooms are seen as

suitable when pre-class materials directly complement laboratory work rather than replacing it.

## 5.0 CONFLICT OF INTEREST

The authors declare that there is no conflict of interest regarding the publication of this paper. All authors have contributed to this work and approved the final version of the manuscript for submission to the ATTARBAWIY: Malaysian Online Journal of Education.

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## 7.0 AUTHOR CONTRIBUTIONS

All authors contributed significantly to this manuscript. Mohd Syazwan Mohd Ghazali, the principal investigator, conceptualised the study, designed the methodology, conducted fieldwork and interviews, performed data analysis, developed the process flow mechanisms, and drafted the original manuscript. Muazzin Mupit, Mohd Edyazuan Azni, Zaihar Yaacob, Zulkeflee Sabri, Ahmad Azahari Hamzah, and Mohd Nizam Zahari provided critical review, editorial refinement, and validation of the findings. All authors reviewed and agreed to the published version.

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