

Patterns of Digital Device Usage and Learning Readiness among Undergraduate Students at UiTM Kedah

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DOI: <https://doi.org/10.47772/IJRISS.2026.10200239>

Received: 03 February 2026; Accepted: 10 February 2026; Published: 03 March 2026

ABSTRACT

The increasing integration of digital devices such as smartphones and tablets in higher education has transformed classroom learning, offering greater flexibility and access to learning resources. However, concerns remain regarding their potential to distract students and affect learning readiness. This study examines the relationship between digital device usage during lectures and students' learning readiness at Universiti Teknologi MARA (UiTM) Kedah. Using a stratified random sampling approach, data were collected from 104 Part 3 Bachelor of Administrative Science students through an online questionnaire. Descriptive statistics were employed to examine patterns of device and application usage, while chi-square tests and independent samples t-tests were used to analyse associations between device usage, user category, and related factors. The findings indicate that the majority of students were either partially or fully prepared for digital learning, with the use of multiple devices being more prevalent than single-device usage. Academic applications, particularly notes materials and Microsoft Teams, were more frequently used than non-academic applications during lectures. While no significant association was found between device type and application preference, a significant difference in the number of hours spent on digital devices was observed between light and heavy users. These results suggest that students' device usage habits may influence their engagement and readiness for learning. The study highlights the importance of promoting guided and purposeful use of digital devices to support effective learning in higher education classrooms.

Keywords: Digital Devices, Learning Readiness, Higher Education, Student Engagement, UiTM Kedah

Background of Study

Digital devices, including laptops, tablets, and smartphones, have become integral to students' daily lives (Gikas & Grant, 2013). They are widely used for academic purposes such as accessing course materials, taking notes, and collaborating with peers (Limniou, 2021). The integration of digital technology in education promotes flexible learning, improves access to information, and enhances student engagement, making it a key component of modern higher education (Sanna, Morten, & Elaine, 2025; Ramazan Yilmaz, 2017).

Despite these benefits, educators have expressed concerns regarding potential distractions from non-academic use, including social media, messaging, and entertainment. Research indicates that such distractions can reduce students' concentration and negatively affect academic performance (Attia et al., 2017).

A key factor influenced by digital device use is learning readiness, defined as a student's mental, emotional, and behavioral preparedness to engage in learning activities (Md Abdullah Al Mamun, Ashik Ahmed, & Mirza Muntasir Nishat, 2015). Students with higher learning readiness tend to demonstrate better concentration, participation, and comprehension. Factors influencing learning readiness include motivation, attention, and the

classroom environment (Alanoglu et al., 2025). Previous research highlights that in-class digital device usage, whether for academic or non-academic purposes, can negatively impact attention and learning outcomes (Jyothi et al., 2011; Faria Sana, Weston, & Cepeda, 2013).

At Universiti Teknologi MARA (UiTM) Kedah, the use of digital devices is widespread among students as part of their daily learning routines. However, research examining how in-class usage affects students' learning readiness in this context remains limited. Understanding this relationship is essential to ensure that technology supports rather than hinders learning.

This study aims to investigate the effect of digital device usage during class on students' learning readiness at UiTM Kedah. The objectives are to assess students' readiness for engaging with digital learning materials while considering demographic factors such as gender and class; identify the digital devices and applications most frequently used, including smartphones, laptops, tablets, and learning or communication platforms; examine the relationship between device type and application preferences; compare light and heavy users across class groups to understand differences in usage patterns; and explore the potential impact of daily device usage on vision by investigating its relationship with eyewear. Collectively, these objectives provide a comprehensive understanding of how digital technology influences students' learning readiness and behaviors in the classroom.

METHODOLOGY

Population and Sample

The study population consists of all Part 3 students enrolled in the Bachelor of Administrative Science program at UiTM Kedah, totalling 114 students across three classes: KAM2383A, KAM2383B, and KAM2383C. The sampling frame includes the same group, and a sample of 104 students was selected based on the Krejcie and Morgan Table (2023).

A Stratified Sampling Technique was employed to ensure representation from each class. The population and sample distribution for each class were as follows: KAM2383A had 40 students with a sample of 36; KAM2383B had 39 students with a sample of 36; and KAM2383C had 35 students with a sample of 32. Within each stratum, simple random sampling was applied using a digital spin wheel. All student names from each class were entered into the tool, and selections were made according to the sample size determined by the Morgan Table. This procedure was repeated for each class to ensure a randomly selected and representative sample, as summarized in Table 1.

Table 1. Samples Size

Group	Number of Students (N)	Sample Size (S)
KAM2383A	40	36
KAM2383B	39	36
KAM2383C	35	32
Total	114	104

Data Collection

Data were collected using a structured online questionnaire administered via Google Forms. The questionnaire consisted of two main sections:

Section A: Demographic Profile

This section gathered information on students’ gender (male or female) and class enrollment (KAM2383A, KAM2383B, or KAM2383C). Both variables are qualitative with a nominal level of measurement.

Section B: Student Readiness and Digital Device Usage

1. Most Used Device During Lectures – Students indicated whether they use a Smartphone, Tablet, or Both devices. This variable is qualitative and measured at the nominal level.
2. Preferred Application During Lectures – Students selected the applications they use during class, including Microsoft Word, Microsoft Teams, Notes Material, Chat Applications, or social media. This variable is qualitative with a nominal level of measurement.
3. Duration of Device Usage – Students reported the number of hours spent using digital devices during one day of class. Responses were entered in an open-ended format, with most students reporting between one and eight hours. This variable is quantitative and measured at the ratio level, as it includes a meaningful zero.
4. User Category (Light or Heavy User) – Students were categorized based on their daily device usage. This variable is qualitative with an ordinal level of measurement.
5. Types of Eyewear – Students indicated whether they use Glasses, Contact Lenses, or no eyewear while using digital devices. This variable is qualitative with a nominal level of measurement.

Data Analysis

Data analysis in this study was conducted to examine students’ digital device usage, learning readiness, and related factors during class. Each research objective was addressed using specific variables and appropriate statistical methods as Table 2.

To assess students’ readiness based on demographic factors, student readiness, gender, and class were analyzed. Pie charts were used to illustrate students’ readiness levels, while bar charts presented gender and class distributions. The most frequently used devices during lectures were examined using pie charts to identify whether students preferred smartphones, tablets, or both devices. Similarly, students’ preferred applications, including learning and communication platforms, were represented using pie charts to highlight usage patterns.

The relationship between digital device usage and application preferences was analyzed using cross-tabulation and the chi-square test to determine whether the type of device influenced students’ choice of applications. Differences between light and heavy users across class groups were also explored using cross-tabulation and the chi-square test, allowing for a comparison of students who use devices for shorter versus longer durations each day. Finally, the potential impact of daily digital device usage on vision was investigated by examining the relationship between hours spent on devices and the type of eyewear used, employing the independent samples t-test to identify significant differences. Together, these analyses provide a comprehensive understanding of students’ digital device usage, learning readiness, and associated behavioral patterns in the classroom.

Table 2. Summary of Variables and Statistical Method

No.	Research Objective	Variables	Statistical Method
1	To describe students’ learning readiness during lectures based on demographic factors, specifically gender and class group.	- Student Readiness- Gender- Class	Gender-Pie Chart Class- Bar Chart Student Readiness- Bar Chart

2	To identify the types of digital devices most frequently used by students during lectures, including smartphones, tablets, or the use of both devices.	- Device Usage	- Pie Chart
3	To determine the most frequently used applications during lectures, including academic and non-academic applications.	- Application Preference	- Pie Chart
4	To examine the association between digital device type and applications used during lectures.	- Digital Device Usage-Application Used	- Cross Tabulation- Chi-Square Test
5	To examine the association between user category (light and heavy users) and eyewear usage among students.	- User Category (Light / Heavy)- Eyewear usage	- Cross Tabulation- Chi-Square Test
6	To compare the average number of hours spent using digital devices between light and heavy users during lecture days.	- Hours Spent on Devices- Category User	- Independent Samples T-Test

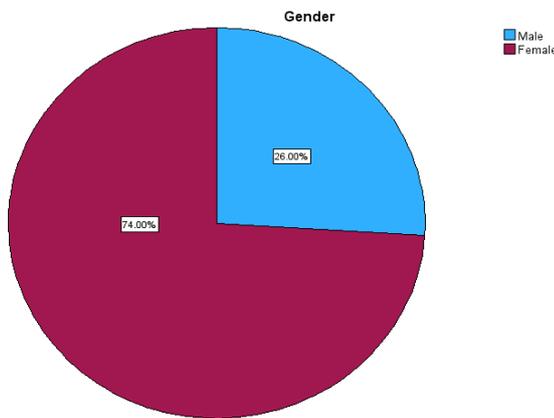


Figure 1. Pie Chart by Gender

Figure 1 shows the gender distribution of the 104 respondents shows that the majority of students are female. Specifically, 74 students (71.2% of the total sample) are female, while 26 students (25.0%) are male. There were 4 missing responses, representing 3.8% of the total sample. Overall, the results indicate that female students comprise nearly three-quarters of the respondents in this study.

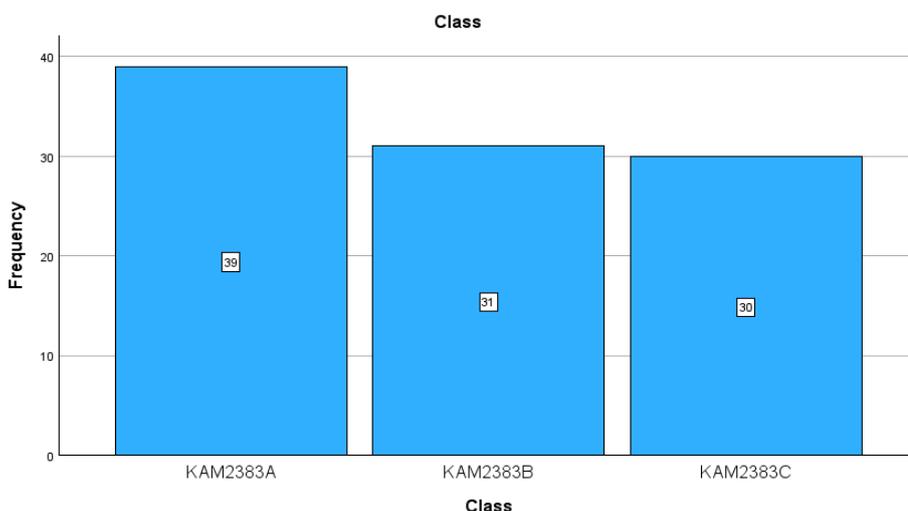


Figure 2. Bar Chart by Class

The analysis in Figure 2 provides a clear overview of the respondents' background in terms of class grouping. The bar chart shows the demographics of the three Part 3 classes: KAM2383A with 39 students (37.5%), KAM2383B with 31 students (29.8%), and KAM2383C with 30 students (28.8%). This demographic information offers important insights into students' readiness to use digital learning materials in class, taking into account differences based on gender and class grouping.

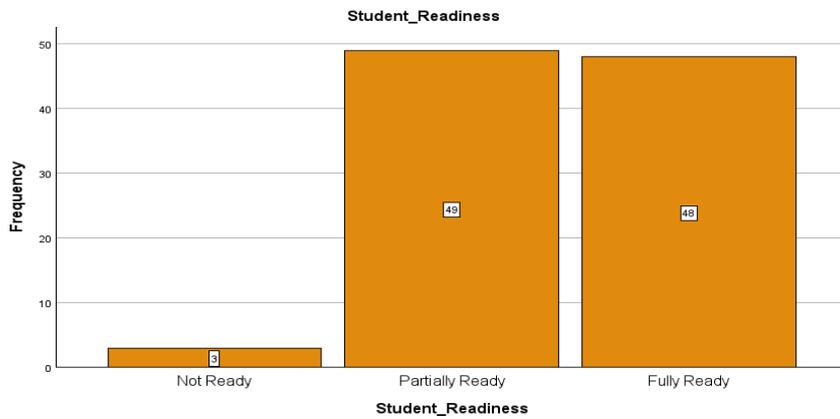


Figure 3. Bar Chart of Student Readiness

A total of 100 valid responses were used for the analysis as stated in Figure 3. Only 3 students (2.9%) were found to be unprepared for digital learning. In contrast, 49 students (47.1%) were partially prepared, while 48 students (46.2%) were fully prepared. Overall, these results indicate that most students are either ready or nearly ready to engage with digital learning materials during class, suggesting a generally high level of student readiness.

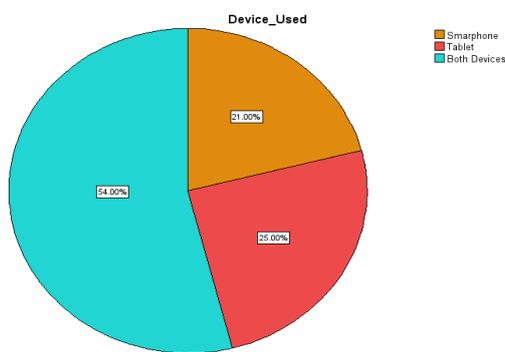


Figure 4. Pie Chart of Device Used

Figure 4 shows of the respondents by device used, 21 (20.2%) used smartphones, 25 (25%) used tablets, and 54 (51.9%) used both devices, indicating that dual-device usage was more common than single-device usage. Four responses were missing.

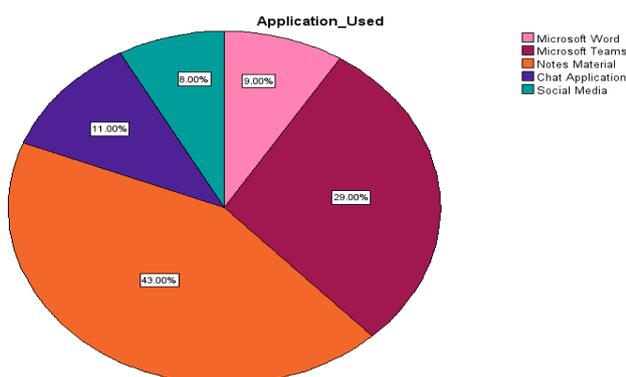


Figure 5. Pie Chart of Application Used

Among 100 respondents, notes materials were the most used application (43, 41.3%), followed by Microsoft Teams (29, 27.9%), chat applications (11, 10.6%), and Microsoft Word (9, 8.7%) as shown in Figure 5. Social media was the least used during lectures (8, 7.7%), primarily for educational purposes.

Table 3. Cross tabulation of digital device usage and application used during lecture time

Device User/Application used	Microsoft Word	Microsoft Teams	Notes Materials	Chat Applications	Social media	Total
Smartphone	3	4	9	3	2	21
Tablet	3	7	7	6	2	25
Both Devices	3	18	27	2	4	54
Total	9	29	43	11	8	100

Table 3 presents the cross-tabulation between the type of digital device used and the applications accessed during lecture time. Overall, the majority of students used both smartphone and tablet devices (54%), followed by tablets only (25%) and smartphones only (21%). Across all device categories, note materials were the most frequently used application (43%), indicating that digital devices were primarily used for academic purposes during lectures. Students who used both devices showed the highest engagement with note materials (27 students) and Microsoft Teams (18 students), suggesting that multi-device users tend to utilise digital tools more actively for learning-related activities.

Tablet users also demonstrated substantial use of Microsoft Teams (7 students) and note materials (7 students), reflecting the tablet’s suitability for accessing learning platforms and lecture content. Smartphone users showed relatively lower usage across all applications, with note materials being the most common (9 students).

In contrast, the use of non-academic applications, such as chat applications (11 students) and social media (8 students), was comparatively low across all device types. This suggests that although digital devices were present during lectures, they were largely used to support learning rather than for off-task activities.

Table 4. Chi-square Test

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-square	11.358	8	0.182
Likelihood Ratio	11.499	8	0.175
Linear -by -Linear Association	0.287	1	0.592
N of valid cases	100		

The hypothesis test examined the association between digital device type and applications used during lecture time. The null hypothesis (H_0) stated that there is no association between device type and application use, while the alternative hypothesis (H_1) proposed that an association exists. The Pearson chi-square analysis yielded a p-value of 0.182 as shown in Table 4, which is greater than the significance level of 0.05. Therefore, the null hypothesis was not rejected, indicating that there is no statistically significant association between digital device type and application use during lectures.

Table 5. Cross-tabulation of Light and Heavy Users by Eyewear Usage

Type of User	Glasses	Without Glasses	Contact Lens	Total
Light User	21	37	4	62
Heavy User	18	17	3	38
Total	39	54	7	100

The table 5 presents the distribution of digital device users by type of user and visual aid usage. Among light users, the majority do not use glasses or contact lenses (37 out of 62), followed by those who wear glasses (21), while only a small number of use contact lenses (4). Similarly, among heavy users, slightly more individuals wear glasses (18) compared to those without glasses (17), and very few use contact lenses (3). Overall, most respondents do not use glasses (54%), followed by those who wear glasses (39%), whereas contact lens users represent the smallest group (7%). In general, both light and heavy users are predominantly individuals who do not use contact lenses, with light users forming the larger proportion of the sample.

Table 6. Chi-square Test

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-square	2.145	2	0.342
Likelihood Ratio	2.145	2	0.342
Linear -by -Linear Association	0.948	1	0.330
N of valid cases	100		

The hypothesis test examined the association between user category (light vs. heavy users) and eyewear usage. The null hypothesis (H_0) stated that there is no association between user category and eyewear usage, while the alternative hypothesis (H_1) proposed that an association exists. The Pearson chi-square analysis yielded a p-value of 0.342, exceeding the significance level of 0.05. Thus, the null hypothesis was not rejected, indicating no statistically significant association between user category and eyewear usage.

Table 7. Group of Light User and Heavy User

	Type_User	N	Mean	Std.Deviation	Std.Error Mean
Hours_spend	Light	62	2.44	1.388	0.170
	Heavy	38	4.21	2.016	0.327

Table 7 presents the average number of hours spent on digital devices by light and heavy users. Light users (N = 62) reported a mean of 2.44 hours (SD = 1.388), indicating moderate device usage with relatively low variability. Heavy users (N = 38) spent more time on devices, with a mean of 4.21 hours (SD = 2.016), showing greater variation in usage. The standard error of the mean suggests that the estimate for light users (0.170) is more precise than that for heavy users (0.327). Overall, these results indicate a clear difference

in average device usage between light and heavy users.

Table 8. Independent t-test

Hours_spend		
	Equal Variance Assumed	Equal Variance not Assumed
F-test	8.705	
Sig	0.04	
t-test	-5.294	-4.817
df	98	57.163
Significance two-sided	< 0.001	<0.001

An independent samples t-test was conducted to examine whether the mean hours spent on devices differ between light and heavy users. The F-test for equality of variances was significant ($F = 8.705, p = 0.04$), indicating unequal variances; therefore, the results assuming unequal variances were used. The t-test revealed a statistically significant difference in device usage between the two groups, $t(57.163) = -4.817, p < 0.001$. Heavy users spent significantly more hours on devices than light users, suggesting that user category is strongly associated with the duration of digital device use during lecture days.

CONCLUSION AND FUTURE WORKS

This study examined how students' use of digital devices during lecture time relates to their preparation for learning at UiTM Kedah. The independent samples t-test revealed a significant difference in the number of hours spent on devices between light and heavy users. Heavy users reported significantly higher usage, suggesting that students' preparation and engagement with learning activities may be influenced by their gadget habits.

These findings are consistent with previous research. For instance, Limniou (2021) found that students who frequently used digital devices during lectures reported decreased focus and lower academic performance. Similarly, OECD evaluations and studies (Sanna, Morten, & Elaine, 2025) indicate that while digital technologies such as tablets and smartphones can enhance participation and teamwork, they may also lead to challenges if misused or improperly managed in educational settings.

To mitigate the negative effects of improper device use, several recommendations are proposed. University administrators can raise awareness about the careful and purposeful use of devices during class, discouraging irrelevant activities. Lecturers can encourage students to use devices for academic purposes such as note-taking, research, and accessing learning platforms. Students should practice self-regulation by controlling device usage during lectures. Additionally, lecturers can incorporate interactive activities such as guided online exercises, polls, quizzes, and collaborative learning tasks to engage students and promote productive use of technology in class.

ACKNOWLEDGEMENT

The authors would like to express their appreciation to Universiti Teknologi MARA (UiTM) for the financial support of this research.

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