

# MERGING LANES: WHERE E-LEARNING DIVERSITY MEETS FUTURE TRENDS

VOLUME 11, 2026

e-ISBN : 978-629-98755-9-8



ISBN 978-629-98755-9-8



9 786299 875598

**SIG CS@e-Learning**  
**Unit Penerbitan**

**Jabatan Sains Komputer & Matematik**  
**Kolej Pengajian Pengkomputeran, Informatik & Matematik**  
**Universiti Teknologi MARA Cawangan Pulau Pinang**

## **MERGING LANES: WHERE E-LEARNING DIVERSITY MEETS FUTURE TRENDS**

Copyright@2026 by Unit Penerbitan Jabatan Sains Komputer & Matematik (JSKM), Universiti Teknologi MARA Cawangan Pulau Pinang, 13500 Permatang Pauh, Pulau Pinang, Malaysia

**All rights reserved. No parts of this publication may be reproduced or distributed in any form or by any means, or stored in a database or retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying or otherwise, without the prior written permission in writing from Authors of Department of Computer & Mathematical Sciences, Academic Affairs Section, Universiti Teknologi MARA Cawangan Pulau Pinang, 13500 Permatang Pauh, Pulau Pinang, Malaysia.**

### **Advisor**

Dr. Nor Hanim Abd Rahman,  
Universiti Teknologi MARA Cawangan Pulau Pinang, Malaysia

### **Chief Editor**

Ts. Jamal Othman,  
Universiti Teknologi MARA Cawangan Pulau Pinang, Malaysia

### **Editors**

Ts. Dr. Syarifah Adilah Mohamed Yusoff,  
Universiti Teknologi MARA Cawangan Pulau Pinang, Malaysia

Dr Arifah Fasha Rosmani,  
Universiti Teknologi MARA Cawangan Pulau Pinang, Malaysia

Mohd Saifulnizam Abu Bakar,  
Universiti Teknologi MARA Cawangan Pulau Pinang, Malaysia

### **Published by:**

**Unit Penerbitan Jabatan Sains Komputer & Matematik (JSKM)  
Bahagian Hal Ehwal Akademik (BHEA)  
Universiti Teknologi MARA  
Cawangan Pulau Pinang  
13500 Permatang Pauh  
Pulau Pinang  
Malaysia**

**e ISBN : 978-629-98755-9-8**

# DYNAMICS OF DISCRETIONARY SPENDING: A STATISTICAL LEARNING ANALYSIS OF COFFEE CONSUMPTION AND FOOD EXPENDITURE AMONG MALAYSIAN UNDERGRADUATES

Ainul Mazni Mokhtar<sup>1</sup>, Intan Zafirah Zamzam<sup>2</sup>, Fatin Nasuha Ahmad Nazir<sup>3</sup>, Noor Azizah Mazeni<sup>4</sup>  
and \*Zuraira Libasin<sup>5</sup>  
\*zuraira946@uitm.edu.my

<sup>1,2,3</sup>Faculty of Hotel and Tourism Management,  
Universiti Teknologi MARA Cawangan Pulau Pinang, Malaysia

<sup>4,5</sup>Jabatan Sains Komputer & Matematik (JSKM),  
Universiti Teknologi MARA Cawangan Pulau Pinang, Malaysia

\*Corresponding author

## ABSTRACT

*As university students navigate escalating living costs, understanding the intersection of lifestyle-driven consumption and financial management is paramount. This study investigates the patterns of monthly food and coffee expenditures among students at Universiti Teknologi MARA Pulau Pinang through a quantitative lens. Utilizing descriptive statistics, confidence interval estimation, and independent samples t-tests, the analysis identifies a mean monthly food expenditure of RM322.60 and a mean coffee expenditure of RM59.78. Despite cultural perceptions of gendered spending, inferential analysis reveals no statistically significant difference in expenditure between male and female students. Furthermore, this research underscores a pedagogical shift by integrating real-world behavioral data into statistical learning, thereby enhancing data literacy and practical reasoning skills among students. These findings provide critical insights for university administrators and financial advisors regarding student economic well-being in an evolving "café culture" environment.*

**Keywords:** *Coffee Consumption, Food Expenditur, Student Lifestyles, Statistical Learning, University Students.*

## 1. Introduction

### 1.1 The Global and Local Context of Coffee Culture

In the contemporary higher education landscape, students navigate a complex balance between academic rigor and the socioeconomic pressures of campus life. Among the most visible discretionary expenses is coffee consumption, which has evolved from a simple dietary habit into a social and academic necessity. Globally, the "third wave" coffee movement has transformed the beverage into a premium commodity, emphasizing origin, artisanal preparation, and the "third place" experience a social environment outside of home and work/study.

In Malaysia, the rise of international coffee chains and a burgeoning local "café culture" has fundamentally shifted consumption patterns among the youth. Current trends indicate that 55.5% of consumers favor branded outlets over traditional options (Ramanathan & Ali, 2021). For students, these

spaces serve as makeshift study halls, social hubs, and productivity zones. Many students adopt the habit of "starting the day" (58.8%) or "boosting energy" (60.0%) during grueling academic schedules (Ramanathan & Ali, 2021).

### *1.2 Socioeconomic Pressures on the Modern Student*

While the culture around coffee grows, so do the financial pressures on Malaysian undergraduates. Many students belong to the B40 (Bottom 40% income group) and M40 (Middle 40%) demographics, relying on PTPTN loans or small scholarships to survive. Recent reports suggest that some Malaysian undergraduates face severe financial constraints, spending less than RM3.00 daily on meals to cope with rising inflation (Rasid et al., 2023).

Against this backdrop, the expenditure on coffee often priced at a premium in specialized outlets—presents a paradox. Is coffee an essential tool for academic survival, or is it a discretionary luxury that strains an already tight food budget? This study seeks to quantify this financial burden by analyzing expenditures at UiTM Pulau Pinang, while simultaneously demonstrating how such behavioral data can be leveraged as a tool for statistical learning in the classroom (Hilliam & Vines, 2021).

## **2. Literature Review**

### *2.1 Psychosocial Drivers of Coffee Consumption*

Prior research indicates that nearly 90% of students consume caffeine to enhance alertness during high-stress periods (Jamal, 2024). However, motivation is not purely physiological. Coffee consumption is deeply tied to social identity. For many, carrying a branded coffee cup is a signal of belonging to a specific modern lifestyle. Research has shown that 60.5% of Malaysian students consume coffee specifically to improve focus during academic tasks, but the "experience" of the café environment is often cited as a secondary motivator (Jamal, 2024; Ramanathan & Ali, 2021).

### *2.2 The Economics of Student Food Habits*

Food spending is typically the largest component of a student's non-tuition expenditure. However, student eating habits are often characterized by "food insecurity" or poor nutritional choices due to budget constraints (Rasid et al., 2023). The "antecedents of food spending" include peer influence, convenience, and proximity to campus facilities. In many cases, students prioritize convenience such as high-caffeine beverages and fast food over long-term financial health (Rasid et al., 2023).

### *2.3 Gender and Spending Behaviors*

Traditional stereotypes often suggest that female students may spend more on lifestyle items, including coffee and aesthetics, while male students might spend more on technology or substantial meals. However, academic studies on gender-based financial behavior in Malaysian universities have yielded mixed results. Some suggest that gender roles in spending are blurring as both male and female students face identical academic pressures and social media influences (Ramanathan & Ali, 2021).

#### *2.4 Statistical Learning in Higher Education*

The pedagogical aspect of this study focuses on "Statistical Learning." Traditional statistics education often relies on sterilized textbook datasets that lack relevance to the student's life. By using data generated from their own spending habits, students engage in "Project-Based Learning," which has been shown to improve attitudes toward data science and enhance retention of complex concepts like p-values and confidence intervals (Cujba & Pifarré, 2024; Hilliam & Vines, 2021).

### **3. Methodology**

#### *3.1 Research Design*

A quantitative, cross-sectional survey design was employed. This approach allowed for the collection of a snapshot of student spending patterns during a typical academic month.

#### *3.2 Participants and Sampling*

The sample consisted of 50 students from Universiti Teknologi MARA Pulau Pinang. A convenience sampling method was used, targeting students across different faculties. The final demographic profile included 9 male (18%) and 41 female (82%) respondents. While the gender ratio is imbalanced, it reflects the actual demographic distribution of many social science and business-related programs in the Malaysian university system.

#### *3.3 Instrument and Data Collection*

An online questionnaire was used to collect data. The instrument comprised three sections:

- i. Demographics: Gender, age, and faculty.
- ii. Financial Data: Monthly total food expenditure and monthly coffee-specific expenditure.
- iii. Behavioural Drivers: Likert-scale questions regarding the perception of coffee as a "wake-me-up tool" or a social necessity.

### 3.4 Data Analysis Plan

Data was analyzed using the following statistical techniques:

- i. Descriptive Statistics: To determine the mean, median, mode, and standard deviation.
- ii. Confidence Interval Estimation: To estimate the population mean with a 95% confidence level.
- iii. Levene's Test: To check for equality of variances between genders.
- iv. Independent Samples T-Test: To test the null hypothesis that there is no significant difference in spending between male and female students.

## 4. Results

### 4.1 Comprehensive Expenditure Profiles

The data revealed a wide range of spending behaviors. Figure 1 shows the average monthly food expenditure was recorded at RM322.60 (SD = 185.19), with a 95% confidence interval of [RM269.97, RM375.23]. This indicates that most students spend between RM270 and RM375 on food per month. For coffee-specific spending, the mean was RM59.78 (SD = 49.31), with a 95% confidence interval of [RM45.77, RM73.79].

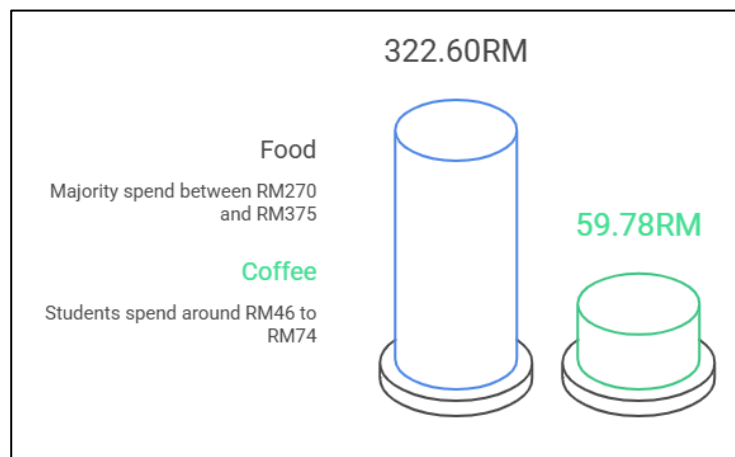


Figure 1: Monthly spending habits of students

### 4.2 Analysis of Central Tendency and Outliers

A critical finding of this study is the positive skewness of the expenditure data.

- i. Food Spending: The mean (RM322.60) is significantly higher than the mode (RM200.00) and the median (RM300.00). This gap suggests that while the "typical" student spends about RM200–RM300, a small group of students with very high expenditures (up to RM1,100) pulls the average upward. Figure 2 indicates that the distribution of monthly food expenditures is positively skewed.

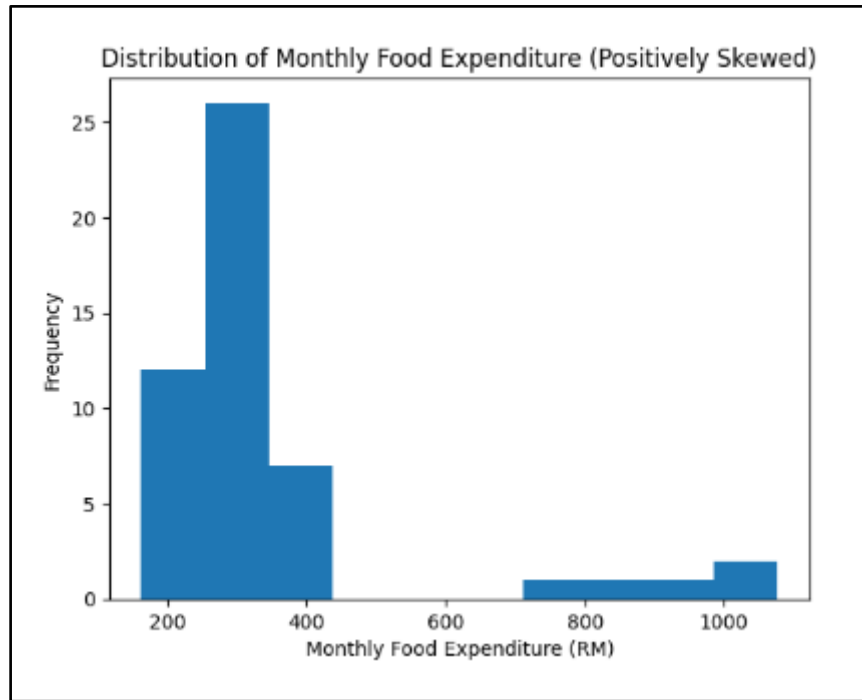


Figure 2: The distribution of monthly food expenditures

- ii. Coffee Spending: Similarly, the mode and median for coffee are both RM50.00, but some students report spending up to RM200.00 monthly. These high spenders likely represent frequent consumers of premium, branded coffee outlets. From Figure 3, we can conclude that the distribution of monthly coffee expenditures is skewed to the right.

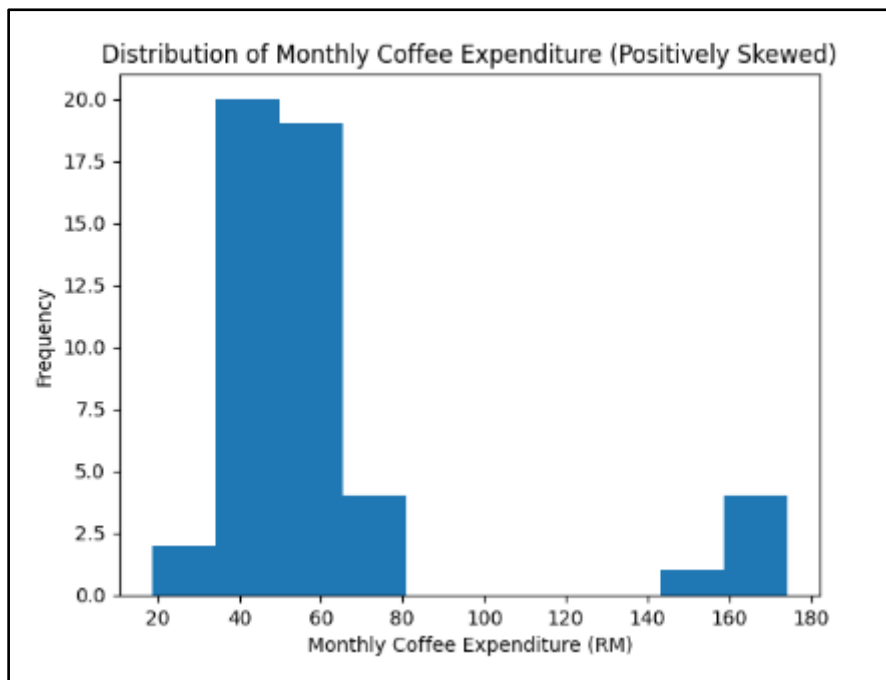


Figure 3: The distribution of monthly coffee expenditures

### 4.3 Inferential Analysis

To test if gender plays a role in spending, we analyzed the coffee expenditure of males ( $M = 64.44$ ,  $SD = 56.59$ ) versus females ( $M = 58.76$ ,  $SD = 48.24$ ).

- i. Levene's Test:  $F = 1.050$ ,  $p = 0.311$ . Since  $p > 0.05$ , equal variances were assumed.
- ii. T-test Results:  $t = 0.310$ ,  $p = 0.758$ .

Because the p-value (0.758) is significantly higher than 0.05, we fail to reject the null hypothesis. There is no statistically significant difference in the amount spent on coffee between male and female students at UiTM Pulau Pinang.

## 5. Discussion

### 5.1 The Economic Impact of the "Coffee Habit"

The findings indicate that coffee expenditure accounts for roughly 18.5% of a student's total food budget. This is a substantial portion of discretionary income for a demographic that is largely unemployed and reliant on loans. This spending behavior aligns with the "Sustainability of the Coffee Industry" report, which notes that students are a primary growth driver for the Malaysian coffee market (Ramanathan & Ali, 2021). Despite the financial strain, students prioritize this expense, suggesting that the perceived benefits of energy for study and social connectivity outweigh the monetary cost.

### 5.2 Comparison with National Spending Benchmarks

Comparing our findings to external literature reveals a stark contrast. While our study found a mean food spend of RM10.75 per day, Rasid et al. highlighted that a growing number of students live on less than RM3.00 per day due to extreme poverty (Rasid et al., 2023). This suggests that our sample may represent a more economically stable subset of the student population, or that students at UiTM Pulau Pinang are prioritizing "café-style" food and beverages over traditional low-cost options.

### 5.3 Pedagogical Implications: Statistics as a Life Skill

A major contribution to this study is its role in Statistical Learning. By having students analyze their own "messy" data (with outliers like the RM1,100 spender), they learn the importance of using the median over the mean in skewed distributions. This mirrors the work of Hilliam and Vines, who argue that simultaneous delivery of statistics to multiple audiences is most effective when the data is personally relevant (Hilliam & Vines, 2021). Students are no longer just calculating numbers; they are uncovering the financial realities of their own peers (Cujba & Pifarré, 2024).

#### 5.4 Limitations

The primary limitation is the small sample size (n=50) and the high percentage of female respondents. While this reflects certain campus demographics, it may not capture the spending habits of male students in more male-dominated faculties (e.g., Engineering). Additionally, self-reported data is subject to recall bias, as students may not track every small purchase accurately.

### 6. Conclusion and Recommendations

This study confirms that coffee consumption is a deeply embedded component of student lifestyle at Universiti Teknologi MARA Pulau Pinang, accounting for a notable proportion of monthly food expenditure. Despite common assumptions regarding gender-based financial behaviour, the findings reveal no statistically significant difference between male and female students, suggesting that spending patterns are more strongly influenced by shared academic demands and social environments than by gender.

The results further highlight the dual nature of coffee consumption as both a functional necessity for academic performance and a discretionary lifestyle choice, reflecting how students navigate financial constraints while prioritising perceived cognitive and social benefits. Importantly, this study also demonstrates that behavioural economic data can serve as an effective pedagogical tool, where the integration of real-world, student-generated datasets enhances data literacy, critical thinking, and applied statistical understanding.

From a practical standpoint, several recommendations emerge for key stakeholders. Universities should reassess the affordability and accessibility of on-campus food and beverage options, particularly by providing cost-effective yet conducive study environments that reduce students' dependence on premium café settings. Financial educators are encouraged to incorporate targeted financial literacy interventions that emphasise the cumulative impact of habitual spending behaviours, such as frequent coffee purchases, to promote more sustainable financial decision-making among students.

In addition, educators should continue to embed authentic, student-derived data into the teaching of statistics and mathematics, as this approach has been shown to improve engagement, conceptual understanding, and the ability to apply analytical techniques in real-life contexts. Collectively, these efforts can contribute to a more holistic development of students, encompassing both financial well-being and academic competency in an increasingly data-driven world.

## References:

- Cujba, A., & Pifarré, M. (2024). Enhancing students' attitudes towards statistics through innovative technology-enhanced, collaborative, and data-driven project-based learning. *Humanities and Social Sciences Communications*, 11(1). <https://doi.org/10.1057/s41599-024-03469-5>
- Hilliam, R., & Vines, K. (2021). When one size does fit all: Simultaneous delivery of statistics teaching to multiple audiences. *Journal of University Teaching and Learning Practice*, 18(2). <https://doi.org/10.53761/1.18.2.4>
- Jamal, N. F. (2024). Caffeine Consumption Pattern and Perception of Its Effect among University Students in Malaysia. *International Journal of Research and Innovation in Social Science*, 3219. <https://doi.org/10.47772/ijriss.2024.803229s>
- Ramanathan, R., & Ali, N. (2021). Coffee Consumption and the Sustainability of the Coffee Industry in Malaysia. *Trends in Undergraduate Research*, 4(2). <https://doi.org/10.33736/tur.3465.2021>
- Rasid, M. F. R. M., Razali, M. Z. M., Ariffin, M. A. F. M., Affendi, M. E. J. M., Hisham, M. A., Suhaime, A. H., Zukarnain, A. N. N., & Faimi, M. A. F. M. (2023). The Antecedents of Food Spending Habits among Students. *Journal of International Business Economics and Entrepreneurship*, 89. <https://doi.org/10.24191/jibe.v8i2.24128>



ISBN 978-629-98755-9-8



**SIG CS@e-Learning  
Unit Penerbitan  
Jabatan Sains Komputer & Matematik  
Universiti Teknologi MARA Cawangan Pulau Pinang**

*e-ISBN : 978-629-98755-x-x*

*Design of the cover powered by  
<https://www.free-powerpoint-templates-design.com/>*