# Vending Machine Purchasing Experience Among Students in the University's Residential College

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*Abstract* — **University colleges provide cafeteria for student living on campus to purchase foods. These cafeteria open on daily basis, located in separate building and usually within a walking distance from college.  A college cafeteria system often has a virtual monopoly on the students due to an isolated location and less competition for on-campus food. There is situation where students must wait for a long time to purchase pre-cooked or ordered foods. The situation will become worse when students are hungry at night and the cafeteria is already closed. In addition most of the cafeterias are closed during semester break since only few students stay at the college. Alternatively, purchasing foods via vending machines are adaptable and acceptable since it operates twenty-four hours seven days a week. Vending machine can provide variety of foods and drinks with affordable price range. This study aims to investigate the purchasing experience among university's residential college students by using vending machine. The result will help vending machine operators develop and customize their own machines to better serve the customers' needs.**

## I.    Introduction

In recent years, poor diet by consuming unhealthy foods becomes major issue and concern worldwide. Saying yes to healthy food is much easier than consistently purchasing and consuming the healthy food. Consume too much unhealthy food will definitely contribute to another major problem such as obesity and dangerous illnesses. The News Strait Times (NST) online (June, 7 2017) reported that obesity in Malaysia is the highest in Southern Asian and the recurrence of obesity was at 13%, while overweight was at 38.5%. These figures were contributed by Malaysian's inadequate exercise and strong culture with food (Farezza, 2017) and the WHO (2016) (as cited in Rosi et al., 2017) indicated that regardless of sex and age, almost 2 billion adults are obese or overweight worldwide. Swinburn et al. (2011), as cited in Bos et al., (2018) reported that recently about 105 individuals are overweight or obese because of imbalance calorie intake and calorie consumption.

Unfortunately, the habit of consuming unhealthy food is rising in number as vending machines' food is currently in demand and rapidly growing in the market. The vending machines are widely placed at university campuses, work area, schools, and public areas. Nevertheless it has become an accessible and acceptable food source in university campuses (Ali et al., 2015). Purchasing foods through vending machines is arising in number yet, hardly to see vending machines offering healthy food. Vending machines normally provide food with very poor nutrient and also energy-dense snacks with almost no healthy food at all (Rosi et al., 2017). Convenient to purchase and get at anytime and anywhere when needed contributes to students changing their purchasing style of consuming foods

Boek et al, (2012) and Hebden et al., (2015), as cited in Tam et al., (2017) expressed that taste, convenience, cost and healthiness are extremely associated with food-purchasing behaviour in young adults.

Living in advanced and modern era with busy schedules and time constraint, consuming and purchasing healthy foods become main concerns especially to university students. They often spend most of their time at college or classes with tons of assignments or final year projects to be completed. Consequently, students turn their ways to purchasing foods or snacks through vending machines especially during midnight as vending machine offer 24 hour's services. Unfortunately, vending machines slowly contribute and develop into unhealthy lifestyle and poor diet as it offers unhealthy foods and beverage. The development of obesogenic environment is caused by the rising in the availability of unhealthy food of vending machines (Rosi et al., 2017) and promoted by the poor nutritional quality of food and beverage offered by vending machines (Matthews & Horacek, 2015).

Moreover, vending machines offered low-price food rather than healthy foods that might be costly for the students. Price frequently becomes problems in purchasing healthier products (Callaghan et al., 2010 as cited in Matthews & Horacek, 2015). In previous study, Tam et al., (2017) reported that 90% of the students wanted less expensive food and discounts on healthy choices at university. This situation makes students tend to choose unhealthy foods rather than healthy foods even though there are healthy foods offered or sold at café. As vending machines offer less-cost food, it becomes the choice of students. Callaghan et al., 2010 as cited in Matthews & Horacek, 2015 mentioned that the most common dietary choices from vending machines are influenced by low-priced energy-dense products and high-priced nutrient-dense products. Thus, this study intends to study the purchasing experience among university's college students via vending machine.

## II. Vending Machine Industry

The vending machine industry has started to evolve from traditional machines to connected machines. The industry has gone beyond just delivering snacks and is developing new and sophisticated retail solutions. Connected vending machines, unlike traditional machines, are engaging shoppers like never before with touch screen controls, audio, video, scents, gesture-based interaction, and cashless payment. There are almost 17 million vending machines worldwide and many of the vending operators are now considering adding connectivity. The author forecasts that the number of connected vending machines worldwide will grow from 1.5 million units in 2015 to reach 3.6 million units by 2020.

Vending machines are great and convenient inventions that can dispense all sorts of items. In the past, they were primarily used to sell items such as drinks and snacks but it looks like the items being sold now are getting wackier and wackier. As the vending machine market is growing, vendors are looking for segments such as school and colleges where they can create demand. To cater to such places, firms are coming up with elegant and energy-efficient vending machines. The market for indoor installation of the machines is also increasing. Indoor vending machines occupy less space without reducing the variety of foods and beverages. Their power consumption is also low (Global Connected Vending Machine Market 2016-2020).

Almost 80 million consumers in the United State of America make purchases every day from approximately 8 million machines nationwide. The result shows that 98 percent of vending purchases are made with cash because only 5% of vending machines accept credit and debit cards. This is because card readers remain too expensive and complex to implement (Rao, 2015). The expectation of paying by cash and coin is particularly painful for the tens of millions of consumers who use vending machines as their work or school fridge. Most of them are not casual users where they visit the same machines every day and deserve an easier way to purchase their morning coffee, bottled water, sandwich or afternoon snacks. Nearly half the time someone walks up to a machine with the intention to purchase, he or she leaves empty handed because the buyer simply does not have the right change. This result in billions of dollars in sales lost each year.

## III. Methodology

This study was conducted in one of branch universities for the largest public university in the Malaysia. In line with the cultural norms of Malaysia society, there are separate male and female colleges. During the period of this study, 28 vending machines were available at 6 residential colleges. Study was conducted using online questionnaire for 2 months. The first part of the questionnaire contained questions related to the characteristics of the respondents (gender, age, and residential college). The second part of the questionnaire focuses on the respondents experience with the university residential college vending machine. The respondents were also asked about their perception of the university residential college vending machine in the third part of questionnaire. The questionnaire items were ranged on a 5-point Likert scale from 1 (very poor) to 5 (excellent).

In the last part of the questionnaire, students were asked about suggestion for improvement by using on a 5-point Likert scale from 1 (not at all likely) to 5 (extremely likely).

## IV. Result

Vending machine is one of the alternative ways for students to get food fast and cheap. However questions arise when it comes to healthy meal provided by the vending machine. Majority of the students rarely purchased healthy products because they feel that healthy food are more expensive, less value, lack of variety, not tasty enough and healthy food are available at home (Callaghan et al., 2010).

A total of 219 residential college students participated in this study. Table 1.0 shows the demographic characteristic of the respondents. The respondents were 179 (81.7%) female and 40 (19.6%) male. Respondents from 6 residential colleges participated in this survey with majority of them staying at Dahlia College 106 (48.4%). The distribution of respondents' age is almost the same with 94 (42.9%) of between 20 to 21 years old and 90 (41.1%) of 22-23 years old.

Table 2.0 shows their experience with the vending machine. 207 respondents (94.5%) are aware of the existence of vending machine in the college and 195 (88.3%) of them have used it at least once. Majority of the respondents with 91 students (41.6%) are likely buy the items from a vending machine late at night, followed by 56 (25.6%) sometime in the afternoon around dinner time. 135 out of the total respondents (61.6%) spend less than RM3 for each vending machine purchase. According to Noor'ain et al. (2018), economic situation, personal preferences and group influence will greatly influenced consumer decision making.

Table 1.0: Demographic Characteristics of the Respondents (n=219)

| Gender | | |
|---|---|---|
| Male | 40 | 18.3% |
| Female | 179 | 81.7% |
| **Age** | | |
| 18-19 years old | 24 | 11.0% |
| 20-21 years old | 94 | 42.9% |
| 22-23 years old | 90 | 41.1% |
| 24 years old and above | 11 | 5.0% |
| **College** | | |
| Rafflesia | 32 | 14.6% |
| Angsana | 35 | 16.0% |
| Casuarina | 39 | 17.8% |
| Zamrud | 6 | 2.7% |
| Dahlia | 106 | 48.4% |
| Baiduri | 1 | 0.5% |

Table 2.0: Student Experience with Vending Machine (n=219)

| | | |
|---|---|---|
| **Do you notice vending machine at your college?** | | |
| Yes | 207 | 94.5% |
| No | 12 | 5.5% |
| | | |
| **Do you use vending machine at the college?** | | |
| Yes | 195 | 89.0% |
| No | 24 | 11.0% |
| | | |
| **How often would you say you use the vending machine?** | | |
| Never | 17 | 7.8% |
| 1-2 times a week | 65 | 29.7% |
| 3-4 times a week | 25 | 11.4% |
| 5-6 times a week | 7 | 3.2% |
| Every day | 12 | 5.5% |
| Once every couple of weeks | 42 | 19.2% |
| Once every few months | 51 | 23.3% |
| | | |
| **At what time of day you likely buy item from a vending machine** | | |
| Early in the morning | 5 | 2.3% |
| Before lunch | 6 | 2.7% |
| After lunch | 8 | 3.7% |
| Sometime in the afternoon around dinner time | 56 | 25.6% |
| Late evening | 24 | 11.0% |
| After dinner time | 29 | 13.2% |
| Late night | 91 | 41.6% |
| | | |
| **How much do you spend for each vending machine purchase?** | | |
| Less than RM3 | 135 | 61.6% |
| RM4- RM6 | 73 | 33.3% |
| RM7-RM9 | 7 | 3.2% |
| RM10 and above | 4 | 1.8% |

Table 3.0 shows the mean and standard deviation for vending machine facilities. Majority of the respondents are satisfied with the cleanliness of the vending machine (m=3.36), trust on the product purchase (m=3.20), satisfied with variety of product (m=3.11) and variety of choices (m=3.06). However they are not satisfied with the process to obtain a refund (m=2.63), the process to restock items in machine (m=2.68) and the time taken to repair the machine (m=2.69). The overall quality of vending machine is above the fair rate with the mean of 3.05. The technology has improve the supply chain and save operation costs for vending machine business. Hence the level of customer service confidence increase and the operator can anticipate for future needs (Fernandes, Silva, Reis, & Leão, 2016).

Table 3.0: Vending Machine Facilities for (n=219)

| | Mean | Std. Deviation |
|---|---|---|
| Variety of the products | 3.11 | 0.915 |
| Variety of choices | 3.06 | 0.901 |
| Level of trust on the product | 3.20 | 0.886 |
| Well stocked machines | 2.68 | 1.053 |
| Cleanliness of vending machine | 3.36 | 0.925 |
| Functioning vending machine | 2.84 | 1.044 |
| Cash method of payment | 2.98 | 1.042 |
| Ease of obtaining a refund | 2.63 | 1.082 |
| Timely repair of equipment | 2.69 | 0.992 |
| Responsive of the operator | 2.83 | 0.947 |
| Price per items | 2.81 | 1.026 |
| Overall quality of vending machine | 3.05 | 0.996 |

Table 4.0 shows the mean and standard deviation for vending machine improvement. The mean for touch and go payment was 3.41, the mean for vending purchase was 3.06, the mean for recommending vending machine to a friend was 3.05, the mean for debit card payment method was 3.02, the mean for value for money was 2.88 and the mean for credit card payment method was 2.57. It was clearly shown that the respondents would like to recommend the use of touch and go payment method for purchasing items. They would not recommend the use of credit card method of payment. They also want items that they bought are of value for their money. The involvement of students in giving out opinions for vending machine in the university is considered as one good strategy to promote healthful choices of food for students (Ali et al., 2015). At the same time, the students' views can also be one of the campus nutrition education strategies to healthy lifestyle (Ali et al., 2015).

Table 4.0: Vending Machine Suggestion for Improvement (n=219)

|  | Mean | Std. Deviation |
|---|---|---|
| How likely are you to purchase from vending machine? | 3.06 | 0.793 |
| How likely would you bought in terms of value for money? | 2.88 | 0.834 |
| How likely would you recommend vending machine to a friend? | 3.05 | 0.996 |
| How likely would you recommend the use of touch & go method of payment? | 3.41 | 1.115 |
| How likely would you recommend the use of debit card method of payment? | 3.02 | 1.175 |
| How likely would you recommend the use of credit card method of payment? | 2.57 | 1.149 |

## V. Conclusion and Recommendation

The findings of the present study can be useful for vending machine operator to expand their services. Most of the respondents felt that the food items available in the vending machines at the university college should be improved. They made a number of suggestions for ways in which the operators could improve the quality of food items and provide more options to the students. Introducing variety options with affordable price would both satisfy consumers and may be a feasible solution for improving the on-campus food environment.

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