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Abstract

Mobile apps have been increasingly popular in recent years. However, there is a lack of research on the gender and education level of youth in relation to mobile apps usage. This study aims to explore the significant differences between gender and education level of youth, with trust, mobile apps environment (MAD - mobile apps design and MAU - mobile apps usability), image appeal, and emotion. A survey was conducted through online mode with 388 questionnaires completed by online youth shoppers in all states in Peninsular Malaysia. The results revealed no significant differences between gender and all the aforementioned variables. However, the findings indicate that education level plays an important role in determining the trust and mobile apps usability among youth users, in which significant differences were found between trust and mobile apps usability among youths with high education level. This reflects the need for practitioners to ensure security mechanism of their mobile apps (especially in payment system and customer data protection) is top notch to increase potential and existing apps user's trust towards the apps. Besides, noting that apps usability plays an important role among youths with high education level, practitioners need to ensure that their mobile apps are mobile friendly, hassle free, and easy to use among these youth users.

Introduction

Global adoption of mobile devices especially smartphones has been boosted further by a plethora of mobile applications which have made users' lives more convenient as they can

now easily perform their daily activities seamlessly using their smartphones. A mobile application (mobile app) is a software application designed to run on small, wireless devices such as smartphones, tablets, and smartwatches rather than desktops or laptop computers. Users' increasing reliance on mobile devices has been quickly leveraged by e-commerce players to expand their business endeavor into m-commerce platforms. M-commerce (mobile commerce) refers to the purchase and sale of goods and services via wireless handheld devices such as smartphones and tablets. M-commerce is a facet of e-commerce in which users can access online shopping platforms such as through mobile apps without using a desktop computer.

With a total population of 34.13 million recorded as in January 2023, Malaysia is an appealing market for e-commerce in Southeast Asia because of its fast-growing economy and advanced infrastructure for digital technologies (Digital 2023: Malaysia & DataReportal – Global Digital Insights, 2023). Until January 2023, Internet penetration in Malaysia stood at 96.8% which has included 44.05 million of cellular mobile connections, equivalent to 129.1% of the total population. It is worthy to note that many people have more than one mobile connection, therefore the percentage may exceed 100% of the total population (Digital, 2023, Malaysia & DataReportal – Global Digital Insights, 2023).

Backtrack from January to December 2022, the e-commerce market in Malaysia has been expanding faster than ever with 15.63 million of Malaysians purchased consumer goods via the Internet which equals to USD9.08 billion, with 54.7% of it was made via mobile phones (Digital 2022: Malaysia & DataReportal – Global Digital Insights, 2022). Product categories that are frequently purchased online are fashion, electronics, toys, DIY, hobbies, furniture, personal and household care, food and beverages as well as physical media (Digital 2023: Malaysia & DataReportal – Global Digital Insights, 2023).

It is a vast opportunity for marketers to tap into the prosperous Malaysian m-commerce market considering that 55.9% of e-commerce transactions in Malaysia are completed on a mobile device between 2021-2022, due to increasing smartphone penetration which means more people will make the choice to shop online using mobile devices (Okeleke et al., 2022). As Malaysians of all ages are engaging in the country's m-commerce scene, this study yet attempts to explore the attractiveness of a specific consumer market of youth as more young generation spends money on online shopping than ever before (Kumar et al., 2022).

According to Hand Phone Users Survey 2021 published by Malaysian Communications and Multimedia Commission, 35.3% of Malaysian handphone users were youth aged 15-24 years old, with 53.2% of mobile phone users are male, while 46.8% of them are female. Malaysian youths purchase online for a variety of reasons such as convenience, accessibility, pricing, product selection, product information, and ease of payment. In addition, the smartphone is the most popular device used by consumers below 30 years old to purchase online (Johan et al., 2022).

In line with that, this study aims to investigate significant differences between youth's gender and education level towards trust, mobile apps environment (mobile apps design (MAD) and mobile apps usability (MAU), image appeal and emotion.

The findings may help e-commerce players to have clearer insights on youth consumer profile to better understand the characteristics of this market as well as how this market behaves and could possibly react to their business strategies.

Literature Review

This paper attempts to investigate significant differences between gender and mobile environment, trust, emotion and image appeal. The following review will be based on the differences between gender, educational background and these four aspects, namely mobile environment, trust, emotion and image appeal.

Gender and mobile apps environment (MAD and MAU), trust, emotion and image appeal.

In general, compared with the female group, the male group had a generally positive attitude towards online shopping (Dai et al., 2019). Zooming to the mobile applications environment, past researchers such as Dai et al (2019) found significant differences between male counterpart (as opposed to female counterpart) and mobile web environment. However, by looking at the perspectives of brand image perceptions, Anbumathi et al (2023) found that mobile environment provides significant differences for both males and females. Viewing the aesthetic view of mobile environment, Oyibo et al (2019) discovered that classical aesthetics of mobile environment are more significant among males as compared to females.

In another, when looking at the effect of trust across gender, it is worth to note that building trust towards mobile apps usage is very challenging, especially across gender (Mumu et al., 2022). Factors such as complexity of mobile apps usage can affect trust of using mobile apps across both genders. For example, women usually feel skeptical about using mobile apps because they consider it to be complex (Chawla & Joshi, 2020). In viewing the significant effect between gender and trust towards mobile apps, Saglam et al (2021) discovered no significant differences between gender and trust of using mobile apps.

In viewing the significant differences between gender and image appeal in mobile apps, factors such as visual elements and human image affect mobile apps. The inclusion of human images helps male user to easily recognize advertisements posted in mobile apps. However, visual elements without human images have been noticed more quickly for both genders (Delen & Ilter, 2021).

Due to the inconclusive findings between gender and mobile environment, trust, image appeal and emotion, it is further hypothesized that:

- Hypothesis 1: There is a significant difference between gender and mobile environment.
- Hypothesis 2: There is a significant difference between gender and trust.
- Hypothesis 3: There is a significant difference between gender and image appeal.
- Hypothesis 4: There is a significant difference between gender and emotion.

Educational background and mobile environment, trust, image appeal and emotion

Gong et al (2020) found significant differences between educational background and trust of using mobile apps, where higher education users tend to exhibit greater trust in mobile apps as compared to their counterpart. There have been research that discovered no significant differences between education level and mobile apps, especially with regard to

trust of mobile apps advertisement (Leong et al., 2020) and mobile communications apps (Saglam et al., 2021).

The inconsistent findings above resulted in the following hypotheses being postulated:

- Hypothesis 5: There is a significant difference between educational background and trust.
- Hypothesis 6: There is a significant difference between educational background and mobile apps environment.
- Hypothesis 7: There is a significant difference between educational background and image appeal.
- Hypothesis 8: There is a significant difference between educational background and emotion.

Methodology

The existing measurement scale used has been based on adoption and adaptation from past research, namely mobile apps environment (mobile apps design and mobile apps usability), emotion from Lyubomirsky and Lepper (1999), trust and image appeal from Cyr et al (2009) as well as (Hassanein and Head, 2007). A survey was conducted through online mode with 388 questionnaires completed by online youth shoppers in all states in Peninsular Malaysia.

The selection of respondents has been based on purposive sampling with only respondents within the age of 18 to 24 years old (youth) were chosen for the survey as this age group has more authority in making shopping purchases through mobile apps. Respondents were also drawn solely from Peninsular Malaysia, which accounted for 81.04% of Malaysia's total population of 32.7 million people (Department of Statistics Malaysia, 2020). The survey data was analyzed using SPSS.

Analysis

Demographic Profiles of respondents

The respondents were selected from different demographic profile with regard to gender, age ethnicity, educational background, marital status, monthly income and residential state. The data gained through the survey from 388 respondents and the majority were female (74.2%). It was collected among youth aged between 18 and 24 years old. Based on the results, 22 years old was the highest age group with 35.6% respondents, followed by 21 years old (21.6%), 20 years old (20.9%), 23 years old (10.8%), 19 years old (8.8%), 24 years old (2.1%) and the least, 18 years old with 0.3%. There were three ethnic groups classified from the collected data, with 95.4% Malay, 1.5% Indian and 3.1% were from other ethnic groups. As for educational background, the representation of the data was more of Bachelor Degree (72.9%), followed by Diploma (14.7%), SPM/STPM (11.6%) and Postgraduate (0.8%). 99.5% of the respondents were single (Table 1).

Table 1
Demographic Profile of Respondents

	Frequency	Percent (%)	Valid Percent (%)	Cumulative Percent
Gender				
Male	100	25.8	25.8	25.8
Female	288	74.2	74.2	100
Age (years old)				
18	1	0.3	0.3	0.3
19	34	8.8	8.8	9.0
20	81	20.9	20.9	29.9
21	84	21.6	21.6	51.5
22	138	35.6	35.6	87.1
23	42	10.8	10.8	97.9
24	8	2.1	2.1	100
Ethnic				
Malay	370	95.4	95.4	95.4
Indian	6	1.5	1.5	96.9
Others	12	3.1	3.1	100
Level of education				
SPM/STPM	45	11.6	11.6	11.6
Diploma	57	14.7	14.7	26.3
Bachelor's Degree	283	72.9	72.9	99.2
Postgraduate	3	0.8	0.8	100
Marital status				
Single	386	99.5	99.5	99.5
Married	2	0.5	0.5	100
Monthly income				
Less than RM2500	279	71.9	71.9	71.9
RM2500-RM4849	47	12.1	12.1	84.0
RM4850-RM10959	40	10.9	10.9	94.3
RM10960-RM15039	15	3.9	3.9	98.2
More than RM15039	7	1.8	1.8	100
Residential state				
Perlis	2	0.5	0.5	0.5
Terengganu	27	7.0	7.0	7.5
Kelantan	75	19.3	19.3	26.8
F.T. Kuala Lumpur	21	5.4	5.4	32.2
F.T. Putrajaya	1	0.3	0.3	32.5

Kedah	24	6.2	6.2	38.7
Penang	9	2.3	2.3	41.0
Perak	28	7.2	7.2	48.2
Selangor	142	36.6	36.6	84.8
Negeri Sembilan	9	2.3	2.3	87.1
Malacca	10	2.6	2.6	89.7
Johore	21	5.4	5.4	95.1
Pahang	19	4.9	4.9	100

Descriptive Analysis of the Variable

Table 2 below displays the mean scores for all the variables measured using the 5-Point Likert Scale. The mean scores for factors related to mobile app environment, mobile app design (MAD), and mobile app usability (MAU) are 4.0994 and 3.2680, respectively. While emotion received a mean score of 3.8923, image appeal and trust received 3.8445 and 3.4790, respectively.

Table 2

Descriptive analysis of the variable

Variable	Mean Score
<i>Mobile Apps Design (MAD)</i>	4.0994
<i>Mobile Apps Usability (MAU)</i>	3.2680
<i>Trust</i>	3.4790
<i>Emotion</i>	3.8923
<i>Image Appeal</i>	3.8445

Factor Analyses

Mobile Apps Environment (MAD & MAU)

The 23 items of the mobile apps environment were subjected to principal components analysis (PCA) using SPSS version 18. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .93, exceeding the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix.

Principal components analysis revealed the presence of four components with eigenvalues exceeding 1, explaining 41.3%, 7.8%, 6.7% and 4.5% of the variance respectively. An inspection of the scree plot revealed a clear break after the second component. The two-component solution explained a total of 52.4% of the variance, with Component 1 contributing 44% and Component 2 contributing 8.4%. To aid in the interpretation of these two components, oblimin rotation was performed and four items were removed (MAD3, MAD5, MAU6 & MAU 8). The rotated solution revealed the presence of simple structure (Thurstone, 1947), with both components showing a number of strong loadings and 19 variables loading substantially on only two components. Component 1 is named as MAD with 17 items, while Component 2 is named as MAU with two items. There was a weak correlation between the two factors ($r = 0.14$).

Trust

The seven items of the trust were subjected to principal components analysis (PCA) using SPSS version 18. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .89, exceeding the recommended value of .6 (Kaiser, 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix.

Principal components analysis revealed the presence of one component with eigenvalues exceeding 1, explaining 67.06% of the variance respectively. An inspection of the scree plot revealed a clear break after the first component. Using Catell's (1966) scree test, it was decided to retain one component for further investigation. Component 1 comprised seven items, named as trust.

Image Appeal

The nine items of the image appeal were subjected to principal components analysis (PCA) using SPSS version 18. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .928, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Bartlett's Test of Sphericity (Bartlett 1954) reached statistical significance, supporting the factorability of the correlation matrix.

Principal components analysis revealed the presence of one component with eigenvalues exceeding 1, explaining 59.11% of the variance respectively. An inspection of the scree plot revealed a clear break after the first component. Using Catell's (1966) scree test, it was decided to retain one component for further investigation. Component 1 comprised nine items, named as image appeal.

Emotion

The five items of emotion were subjected to principal components analysis (PCA) using SPSS version 18. Prior to performing PCA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed the presence of many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .874, exceeding the recommended value of .6 (Kaiser 1970, 1974) and Bartlett's Test of Sphericity (Bartlett, 1954) reached statistical significance, supporting the factorability of the correlation matrix.

Principal components analysis revealed the presence of one component with eigenvalues exceeding 1, explaining 69.23% of the variance respectively. An inspection of the scree plot revealed a clear break after the first component. Using Catell's (1966) scree test, it was decided to retain one component for further investigation. Component 1 comprised five items, named as emotion.

Reliability Analyses

The reliability analyses conducted revealed that the Cronbach alpha coefficient for MAD was .934, the Cronbach alpha coefficient for MAU was .679, the Cronbach alpha coefficient for trust was .918, the Cronbach alpha coefficient for image appeal was .911, while the Cronbach alpha coefficient for emotion was .883 (Table 3).

Table 3

Reliability analyses of variable

Variable	Cronbach Alpha	Number of Items
MAD	0.934	17
MAU	0.679	2
Trust	0.918	7
Emotion	0.883	5
Image appeal	0.911	9

Hypothesis Testing

Hypothesis 1: There is a significant difference between gender and mobile apps environment.

An independent-sample t-test was conducted to compare the MAD scores for males and females. There was no significant difference in scores for males ($M = 4.1000$, $SD = 0.55993$) and females ($M = 4.0992$, $SD = 0.50609$; $t(386) = 0.014$, $p = 0.989$, two-tailed). The magnitude of the differences in the means was very small (eta squared = 0.0000005). For the MAU scores across gender, there was also no significant difference in scores for males ($M = 3.3550$, $SD = 0.93012$) and females ($M = 3.2378$, $SD = 0.82630$; $t(386) = 1.182$, $p = 0.238$, two-tailed). The magnitude of the differences in the means was very small (eta squared = 0.0036).

Hypothesis 2: There is a significant difference between educational background and mobile apps environment (MAD & MAU)

Educational background and mobile apps design (MAD)

A one-way between-groups analysis of variance was conducted to explore the differences of educational background on MAD. Participants were divided into four groups according to their educational background (Group 1: SPM/STPM; Group 2: Diploma; Group 3: Bachelor's degree; Group 4: Postgraduate). The test of homogeneity of variance revealed significant result of 0.832. However, the ANOVA test revealed that there was no significant difference at the $p < .05$ level for the four groups: $F(3, 384) = 1.148$, $p = .330$.

Educational background and mobile apps environment (MAU)

A one-way between-groups analysis of variance was conducted to explore the differences of educational background on MAU. Participants were divided into four groups according to their educational background (Group 1: SPM/STPM; Group 2: Diploma; Group 3: Bachelor's degree; Group 4: Postgraduate). The test of homogeneity of variance revealed significant result of 0.176. The ANOVA test revealed that there was a statistically significant difference at the $p < .05$ level for the four groups: $F(3, 384) = 2.696$, $p = .046$. Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .02. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 2 ($M = 3.56$, $SD = 0.95$) was significantly different from Group 3 ($M = 3.22$, $SD = 0.82$). Group 1 ($M = 3.19$, $SD = 0.86$) did not differ significantly from either Groups 2, 3 and 4. Group 4 ($M = 3.33$, $SD = 1.44$) did not differ significantly from either Groups 1, 2 and 3.

Hypothesis 3: There is a significant difference between gender and trust

An independent-samples t-test was conducted to compare the trust scores for males and females. There was no significant difference in scores for males ($M = 3.5671$, $SD = 0.65401$) and females ($M = 3.4484$, $SD = 0.69273$; $t(386) = 1.498$, $p = 0.135$, two-tailed). The magnitude of the differences in the means was very small ($\eta^2 = 0.005$).

Hypothesis 4: There is a significant difference between educational background and trust

A one-way between-groups analysis of variance was conducted to explore the differences of educational background on trust. Participants were divided into four groups according to their educational background (Group 1: SPM/STPM; Group 2: Diploma; Group 3: Bachelor's degree; Group 4: Postgraduate). The test of homogeneity of variance revealed significant result of 0.07. The ANOVA test revealed that there was a statistically significant difference at the $p < .05$ level for the four groups: $F(3, 384) = 3.889$, $p = .009$. Despite reaching statistical significance, the actual difference in mean scores between the groups was quite small. The effect size, calculated using eta squared, was .03. Post-hoc comparisons using the Tukey HSD test indicated that the mean score for Group 2 ($M = 3.76$, $SD = 0.73$) was significantly different from Group 3 ($M = 3.43$, $SD = 0.67$). Group 1 ($M = 3.41$, $SD = 0.61$) and Group 4 ($M = 3.67$, $SD = 1.15$) did not differ significantly from either Groups 2 or 3.

Hypothesis 5: There is a significant difference between gender and image appeal

An independent-samples t-test was conducted to compare the trust scores for males and females. There was no significant difference in scores for males ($M = 3.8800$, $SD = 0.66003$) and females ($M = 3.8322$, $SD = 0.62006$; $t(386) = 0.653$, $p = 0.514$, two-tailed). The magnitude of the differences in the means was very small ($\eta^2 = 0.0011$).

Hypothesis 6: There is a significant difference between educational background and image appeal

A one-way between-groups analysis of variance was conducted to explore the differences of educational background on image appeal. Participants were divided into four groups according to their educational background (Group 1: SPM/STPM; Group 2: Diploma; Group 3: Bachelor's degree; Group 4: Postgraduate). The test of homogeneity of variance revealed significant result of 0.132. The ANOVA test revealed that there was no statistically significant difference at the $p < .05$ level for the four groups: $F(3, 384) = 1.228$, $p = .299$.

Hypothesis 7: There is a significant difference between gender and emotion

An independent-samples t-test was conducted to compare the trust scores for males and females. There was no significant difference in scores for males ($M = 3.9080$, $SD = 0.67115$) and females ($M = 3.8868$, $SD = 0.68440$; $t(386) = 0.268$, $p = 0.789$, two-tailed). The magnitude of the differences in the means was very small ($\eta^2 = 0.0001$).

Hypothesis 8: There is a significant difference between educational background and emotion.

A one-way between-groups analysis of variance was conducted to explore the differences of educational background on emotion. Participants were divided into four groups

according to their educational background (Group 1: SPM/STPM; Group 2: Diploma; Group 3: Bachelor's degree; Group 4: Postgraduate). The test of homogeneity of variance revealed significant result of 0.251. The ANOVA test revealed that there was no statistically significant difference at the $p < .05$ level for the four groups: $F(3, 384) = 1.111, p = .344$.

Discussion

Out of all eight hypotheses for this research, only two hypotheses have significant differences. These hypotheses have significant differences between educational background and MAU, and significant differences between educational background and trust. The remaining six hypotheses have no significant differences.

Based on the findings, it shows that educational background plays an important role in determining the mobile apps usability and trust among youth mobile apps users. Youth at Diploma and Bachelor's degree educational level may perceive apps usability and trust differently as compared to those youth in SPM and postgraduate levels. Youth's high education level affects their trust towards the mobile apps and online seller, since they know how to select which apps is reliable for them. This is in line with Gong et al., (2020) as well as Zarouali, Strycharz, Helberger and de Vreese (2022), but contradicts with (Leong et al., 2020; Saglam et al., 2021).

Besides, youth's high education level (as compared to their counterparts at school of SPM level) caused them to use more mobile apps, thus becoming more familiar and easier to use the apps, which in turn will increase their usability towards the apps. This finding contradicts with Schomakers, Lidynia et al (2022) as well as (Papadakis et al., 2022).

Apparently, gender does not have any significant differences with MAU, MAD, trust, emotion, and image appeal. Noting that respondents for this research are among youth within the age of 18 to 24 years old, they are also active mobile apps users (Axcell & Ellis, 2023). Hence, it is of no surprise when these youth gender does not affect the aforementioned variables.

However, when looking towards significant differences across gender, these results are in line with Liu, Chen, Kittikowit, Hongsuchon and Chen (2022). Yet, they are against the findings of Antezana, Venning, Smith and Bidargaddi (2022) as well as (Mateizer and Avram, 2022). Perhaps, other factors such as types of apps usage may give different results across gender comparison on the aforementioned variable.

Conclusion and Recommendation

This research has explored the significant differences between gender and educational level of youth, with trust, image appeal, MAD, MAU, and emotion. The results revealed no significant differences between gender and all the aforementioned variables. However, in regard to education level of youth, significant differences were found between education level, trust and mobile apps usability (MAU). Noting that education level plays an important role in securing trust and apps usability among youth, this reflects the need for practitioners to ensure security mechanism of their mobile apps (especially in payment system and customer data protection) is top notch to increase potential and existing apps user's trust towards the apps. Besides, noting that apps usability plays an important role among youths

with high education level, practitioners need to ensure that their mobile apps is mobile friendly, hassle free, and easy to use among these youth users.

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