Mobile apps usage by Malaysian business undergraduates and postgraduates

Implications for consumer behaviour theory and marketing practice

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Abstract

Purpose – This qualitative, exploratory study uses constructs from the theory of planned behaviour (TPB) and construct variables from literature, as a basis to ascertain similarities and differences in the behaviour by business undergraduates (UGs) and postgraduates (PGs) of mobile apps and the purpose of this paper is to suggest implications for consumer behaviour theory and marketing practice for the two groups of students.

Design/methodology/approach – Literature informed us of the paucity of research on the relationship between behavioural theory and mobile apps usage in the Asia region. An exploratory and interpretivist approach, with thematic analysis, was employed to aid in data processing.

Findings – The investigative outcomes highlighted more similarities than dissimilarities in terms of perceived attitude (e.g. mood, ethical guilt, familiarity, addiction) and more differences in perceived subjective norms (e.g. family, friends, classmates and teammates) and perceived users' behavioural control (e.g. promotional inducements, self-confidence) towards the usage of mobile apps exhibited by two different sets of data.

Research limitations/implications – Homogeneity of participants, small sample size and generalisability of results were the main concern, hence, it warrants further research. In addition a cross-cultural comparison would be beneficial which might generate more meaningful results.

Practical implications – The research, albeit exploratory, serves as a guide for marketers and apps content providers to focus on usability of features and functions of apps as well as credibility, social context, timing, location, excitement of advertisements and promotional messages especially when marketing to the 18-30-age group. The research also shows that practitioners should be nuanced in their appeals to UGs and PGs.

Originality/value – Despite the provision of numerous mobile apps, this study, using the constructs of the TPB as a basis, offers a new insight into the reasons for, and usage of, specific and top popular apps (e.g. FB, Whatsapps and WeChat) Malaysian students used which reflects a varied behavioural dimension as opposed to planned behaviour.

Keywords Marketing, Consumer behaviour, Mobile apps, Theory of planned behaviour, Exploratory research, Malaysian undergraduates and postgraduates

Paper type Research paper

Introduction

Mobile apps have been in the business and commerce, health and numerous other domains for a number of years now, all available on a variety of mobile platforms including smartphones, (the fastest growing) tablets, e-readers and laptops using mainly either Android or Apple platforms. Mobile devices are increasingly being used in the

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education environment (Chen and Denoyelles, 2013; Bomhold, 2013). Not only has this trend enabled "consumption" but also enabled "discovery and production of content" (Chen and Denoyelles, 2013). Bomhold (2013) found that the principle use of smartphones was for social and communication purposes, followed by search engines, tools and productivity, games, music, sports, referencing and hobbies. Song and Lee (2012), in their study on doctoral and masters international students found the principal uses were for communication (e.g. texts), social networking (e.g. Facebook), information (e.g. databases), entertainment (e.g. gaming) and other (e.g. shopping). Persaud and Azhar (2012) found that there were significant differences in the use of smartphones according to age. The younger consumers, including those in the undergraduate (UG) and postgraduate (PG) age groups, i.e. 18-25, tended to use smartphones for texting, taking photographs, social networking and viewing videos, whilst the older age groups, especially those aged between 35-54 years, favoured smartphone use for e-mail, maps, news and information. However, these findings were in contrast to those of Song and Lee (2012) who questioned whether UGs and PGs (despite both being in Persaud and Azhar's, 2012 "younger" age group) displayed similarities or differences in their use. There are still concerns over usability, connectivity, marketing, "spam" and trust in the use of mobile apps (Ku, 2012; Tan *et al.*, 2012; Persaud and Azhar, 2012) and no more so, as the authors have been experiencing in their role as university tutors, in their use by UGs and PGs in higher education (HE).

The purpose of this exploratory study is threefold: to adapt the framework of the theory of planned behaviour (TPB), hitherto used primarily in a quantitative context, in a qualitative context to study the which and why of mobile apps usage by UGs and PGs in a Malaysian context; to populate the constructs (antecedents) of the TPB with variables drawn from previous studies; and to explore the differences and similarities between the behaviours of UGs and PGs in the usage of mobile apps. The adaptation of the TPB in a qualitative context has hitherto not been attempted, but by doing so, the researchers hoped to gain new insights into the behaviour of users in a UG and PG context.

The study used and adapted constructs from the TPB by Ajzen (1991) as the basis for this qualitative, exploratory research. The TPB posits that behavioural intention to perform an activity is determined by: attitude (in this case, attitudes towards the use of mobile apps); subjective norm, defined as one's beliefs about whether significant others think that one should engage in the activity and perceived behavioural control, defined as the perception of how easy or difficult it is to perform a behaviour. Most studies using TPB have used a more quantitative approach and hypotheses testing (e.g. Phau *et al.*, 2014; Yang and Kim, 2012; Khalifa and Shen, 2008; Fusilier and Durlabhji, 2005) but we, in this study, were more interested in the which and why of behaviour. informed by literature (e.g. Yang, 2013; Bhave *et al.*, 2013; Persaud and Azhar, 2012; Magrath and McCormick, 2013; Lee *et al.*, 2010; Lee, 2009) the study looked at each of the three constructs and the variables which comprise them. The constructs were taken from the TPB by Ajzen (1991) and populated by variables informed by previous research. As the research is qualitative in nature it was not the intention to show any causality or relationship between the three constructs. Possible further quantitative studies, informed by this research, could develop testable hypotheses and explore these facets. What this research attempted to show was the differences, if any, between the behaviour of UGs and PGs in the individual variables making up the three constructs from a qualitative viewpoint. The constructs and variables looked at were "attitude towards behaviour of mobile apps" (e.g. "mood", "ethical dilemma" and "familiarity"); "perceived subjective norms" (e.g. "family", "colleagues" and "friends") and perceived behavioural control

(e.g. "advertisement prompts", "regret" and "self-confidence") and linked them to the behavioural intentions of business UGs and PGs mobile apps users in one HE institution in Malaysia. The study also attempts to assess the similarities and differences between the two sets of students. The paper ends with a discussion on the implications of the study on consumer behaviour theory and marketing practice. We postulated a model of behavioural intention and usage by the UGs and PGs, based on the literature (Figure 1).

Whilst studies on marketing, stimuli, information and consumer motivations and emotions are not new (see Persaud and Azhar, 2012; Kim and Lennon, 2010; Park and Lennon, 2009) this is the first study comparing the use of apps by UGs and PGs in a Malaysian context using TPB as a basis for this qualitative research.

Literature review

The following literature review looks at the three constructs of the TPB and identifies some key research which has been conducted, albeit in a quantitative way, on the numerous variables associated with these constructs, identified in Figure 1 and the introduction above.

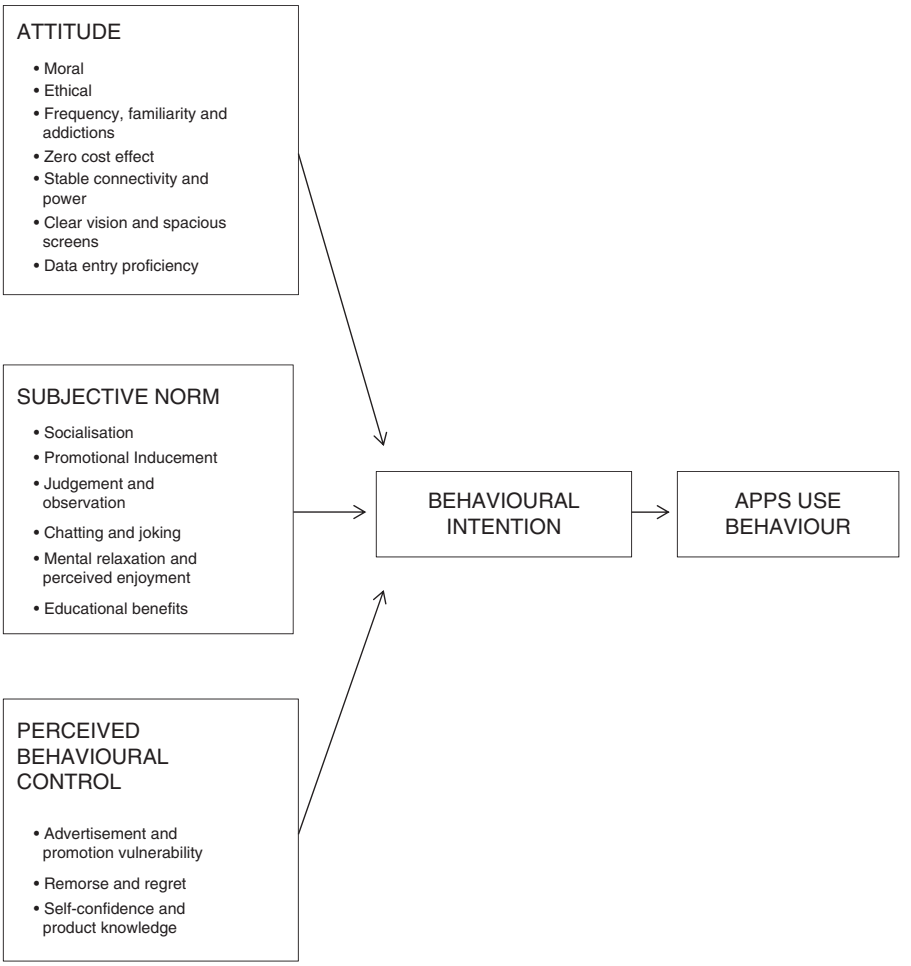

Figure 1.
Proposed model of behaviour intention

Attitude towards the use of mobile apps

Attitude towards the use of mobile apps can be governed very much by such emotions as mood and ethical considerations as well as frequency of use, familiarity and addictions, cost and the actual physical aspects of the medium. As for mood, Yang (2013) found that young American consumers (i.e. students) perceived mobile apps as a good source of fun and pleasure. On ethical considerations, Phau *et al.* (2014) found that individual feelings towards digital piracy affected attitudes towards digital piracy of movies and that moral judgement and social habits had both a negative and positive affect on digital piracy. In a study on why people play mobile social games, for example, Wei and Lu (2014) found that individual gratification played the most important role in why people joined mobile social games and Qiaolei (2014) found that males tended to be more prone to internet addiction than females. The author further found that internet gaming was found to have a great influence on internet dependence. On cost, Bhave *et al.* (2013) found in their study that Generation Y were not willing to pay for apps, in fact if one app was charging for utility, there were others which were providing the same at no cost.

As for the physical aspects of apps, commonality of device and interconnectivity may be issues as identified by Wong (2012) as well as the "educational friendliness" of the device, i.e. tablets more user friendly than phones due to the screen size. There have been many studies undertaken on "usability" of mobile apps. One such comprehensive study was undertaken by Harrison *et al.* (2013). They identified that the increase in usefulness of mobile devices often comes at the expense of usability of these devices in certain contexts. The authors further identified that technology developers often forget that users wish to use the devices on the move so issues of small screen sizes, limited connectivity, high-power consumption rates and limited input modalities are crucial, coupled with an often neglected factor, cognitive overload. These findings confirmed earlier studies, for example, that of Zhang and Adipat (2005) who identified a number of issues, including "mobile context" (i.e. users are not tied to a single location) and may have their attention distracted by interacting with people or the environment; "connectivity" (i.e. slowness and unreliability). This may limit the app performance; "small screen size" (i.e. enhances portability but limits the information content); "different display resolution" (i.e. affecting image quality); "limited processing capability and power" (i.e. enhances portability but limits certain app usage) and finally "data entry methods" (i.e. less capability than desk or laptops so increases the likelihood of erroneous input and decreases the rate of data entry).

Subjective norms

Subjective norms include socialisation, judgement and observation of colleagues' use of apps, chatting and joking, mental relaxation and perceived enjoyment and educational benefits. Taking the social aspect, including mental relaxation and perceived enjoyment and promotional inducement, Wei and Lu (2014) found that in their study of why people play games, games have not only become one of the top downloaded categories of apps, (followed by weather, navigation and social networking) but individual gratification played the most important role in why people join in mobile social games. Moreover, they found that time flexibility and network externalities played a lesser but still important role. The latter finding is important in that it showed the people were likely to use a particular technology when they perceived many other people using it, especially in their social group. The authors went on to suggest that the implication for game marketers is that they must highlight the social aspects of their

games apps, enhance player interaction and develop content that infuses a creative and collective enjoyment atmosphere. On socialisation and educational like benefits, Yang (2013) in a study of UGs in the USA, found that they were more likely to prefer mobile apps which connected people instantly, and on promotions, mobile apps developers should design and market mobile apps with both utilitarian and hedonistic values. In contrast, Lee *et al.* (2010) in a study on UGs and PGs found that there was only partial support for the hypothesis that personal gratification had a significant effect on the intention to use a mobile content-sharing and gaming application. Bhave *et al.* (2013) found that "Generation Y", used smartphone downloaded apps for chat, games, and social networking and that applications had become a social phenomenon, friends being an important source of information in the decision of which apps to download. They also found that they would like to receive such promotional inducements as location-based discounts, coupons and information on new launches. Lee (2009) found that online games were an entertainment technology and, therefore, different from task-oriented technologies. The author also found that group differences, examined in terms of adjustment variables (such as gender, age and prior experience) had a moderating effect on the research model. The results revealed that gender was a key moderator of online game acceptance. However, in the same vein, it was contended that there were some digital piracy which required user's judgement and observation of their peers. User's tended to use their own judgement when observing their peers' engagement and enjoyment, for instance, the use of pirated movies. Past findings revealed that social habits coupled with peer pressure have a significant influence on engagement in digital piracy of movies and hence their intention to use the mobile apps (Phau *et al.*, 2014; Hinduja, 2007; Peace *et al.*, 2003).

As for educational benefits, in an article exploring students' mobile learning practices in HE in the USA, Chen and Denoyelles (2013), in quoting from other studies, (Dahlstrom, 2012) found that although students still rated laptops as the most important devices to their academic success, devices such as tablets smartphones and e-book readers was on the rise. They also found most college tablet device owners said they used the device for academic purposes, while only a smaller percentage of small mobile device owners of e-book reader owners reported doing so. The major uses cited were for social networking, music, games, navigation, entertainment and photography with internal apps, education, books and references apps used mainly for educational purposes. The authors went on to suggest that tablets were key, especially in younger and UG students, and more should be made available. In contrast, Song and Lee (2012) found that in their study, the use of smartphones far outweighed the use of tablets and e-readers. Commonality of device and interconnectivity may be issues as identified by Wong (2012) as well as the "educational friendliness" of the device, i.e. tablets more user friendly than phones due to the screen size.

Perceived behavioural control

The elements to consider here are advertising and promotion vulnerability, remorse and regret, self-confidence and product knowledge. There have been many studies on how marketers should advertise and promote their wares on mobile devices, taking into account the consumer and the consumer's self-confidence and product knowledge. Wei and Lu (2014) stressed the importance of network externalities in the purchase of mobile games, highlighting the fact that consumers self-confidence is boosted by observing the apps others in their social group in particular purchase, and the need for marketers to empathise with the social and creative intentions of consumers, Magrath

and McCormick (2013) stressed the need also to understand the effects of mobile application (app) marketing design. The authors, based on an extensive literature review, delivered a holistic framework of mobile marketing design elements. Product viewing (e.g. video, graphics), informative content (e.g. practical product or service information, sales advice and social media), product promotions (e.g. vouchers, incentives, rewards and discounts) and consumer-led interactions (e.g. personalisation, customisation and augmented reality) were assigned as four framework categories that contain a number of design elements apparent in the mobile and online retail environments. Bhave *et al.* (2013) suggested that brand mobile marketers needed to expand their horizons on marketing to Generation Y. Along with pop-up ads, video and banner adds they need to develop interactive and brand-based applications so that brand loyalty would be increased. The authors found that Generation Y had a positive attitude towards branded apps and were willing to try out branded apps which were useful and engaging. In a comprehensive review of innovative mobile marketing by smartphones, Persaud and Azhar (2012), stressed the importance of not being intrusive, hence allowing the consumer to make up his or her own mind or by reference to others. The authors suggested that marketers must not "sell" but understand the consumer and their mobile marketing "eco-systems", i.e. consumers use a mobile device for business, social networking, entertainment and often, a status symbol. Persaud and Azhar (2012) went on to suggest that marketers must tap into this eco-system, that not all consumers were alike, hence the need for market segmentation and nuancing to appeal to different segments. Above all for mobile marketing to be successful, it must be value laden and value bound for both consumers and marketers alike and not just provide information on products and services. These studies highlight the need for marketers to fully empathise with the customer so that the customer feels self-confident in their purchase and avoid any feelings of regret.

Undoubtedly the advent of mobile devices has given great marketing opportunities and is changing the way marketing theory and practice is done and none more so, than in the realm of consumer behaviour, so marketers must be nuanced in their marketing strategies. This study attempts to highlight some of these changes via the use of mobile apps by UGs and PGs.

Methodology

The methodology used in this paper was based on a phenomenological approach, using a qualitative methods strategy. Qualitative research using case studies can also accommodate a rich variety of data source such as in-depth interviews, survey data, ethnographies, observation and archival data (Kapoulas and Mitic, 2012; Eisenhardt and Graebner, 2007). As a framework for the enquiry we used the TPB as it has been ubiquitously examined in numerous scholarly works related to mobile researches and where "purchase" or "use" is an outcome (e.g. Magrath and McCormick, 2013). The research reported on here, was mainly to populate the "attitude", "subjective norms" and "perceived behavioural content" constructs on the TPB model and to explore their effect on behaviour intention and actual use of mobile apps, using a qualitative approach rather than the more hypotheses testing approach. As the samples used were quite small, from one HEI only and the research was qualitative, the study can be regarded as exploratory in nature.

Developing qualitative research using multiple cases

Prior literature (e.g. Tae *et al.*, 2013; Hume and Mills, 2013; Shin, 2012; Wong, 2012; Yang and Kim, 2012; McCormick and Livett, 2012; Kim *et al.*, 2008) informed the

research of the existent of voluminous consumer intention/motivation theories but in trying to link up this up with mobile apps, we adjusted the conventional approach by resorting to the use of a qualitative approach as the catalyst for our preliminary inquiries as we wished to identify the which, how and why of behavioural intention and usage. The selection of multiple cases would ensure the internal reliability as well as the internal validity of our study (LeCompte and Goetz, 1982; Kirk and Miller, 1986) in relation to the theoretical underpinnings delineated in the literature review. Furthermore, according to Lincoln and Guba (1985) and Guba and Lincoln (1994), qualitative research could also be assessed based on the criteria of trustworthiness and authenticity. In terms of credibility, our study employed and engaged 20 UGs and PGs, respectively from which we derived multiple accounts of social reality. From this group of respondents, we discerned a contextual uniqueness from the Malaysian perspective and culture which could be "transferred" to other similar social groups (milieux) and context. To reaffirm the impartiality of this research (confirmability), we were cautious not to inject any prejudice or bias interventions of the respondents' feedback on the use of mobile apps throughout our data collection process.

We then designed a semi-structured questionnaire consisting of three parts that measure how users' behaviour influenced the usage of mobile apps. Part A: perceived attitude towards behaviour of using mobile apps (e.g. "mood", "ethical dilemma" and "familiarity" were measured). Part B: perceived subjective norm (e.g. "family", "colleagues" and "friends" influences were examined), and Part C: perceived behavioural control (e.g. "advertisement prompts", "regret", "self-confidence" were asked). The semi-structured questionnaire was pilot-tested on three students to determine the validity of constructs measured. Based on this pilot we revised the instrument to include "why" and "how" consumers react to the use of mobile apps.

Data collection

For the purpose of comparison, we used a mix of 20 UGs and 20 PGs business students in 2014 as our unit of analysis, from a Malaysian HEI (Table I). The students acted as the research informants and the selection was based on their outstanding academic performance and sound communication skills as we believed that they were able to think, narrate and delineate their experience and knowledge carefully and meticulously. We administered the semi-structure questionnaires using convenience sampling in classes and any meeting venues that were appropriate over a period of two weeks. We also ensured that they owned and used a smartphone/cellphone for at least two years and secured their willingness to participate. They were allowed two weeks to complete and all the 40 sets of semi-structured questionnaires were returned within the stipulated time given. The data were checked for completeness.

The data were content analysed after coding, emerging themes identified and the frequency of the relevant usages and occurrences recorded. Identification of themes was done using thematic analysis (Ruane and Wallace, 2013; Schembri *et al.*, 2010). For example, to determine the mood (one of the variables of "attitude") of mobile apps users when they connect with friends and family members, we conjectured that they would more likely to experience a positive mood, the concept of which was deduced from Yang's (2013) study on American consumers. We then used the concept-driven category (Saunders *et al.*, 2012) to initiate the steps in analysing the data, followed by unitising the data using "bits" or "chunks" until a theme was obtained. However, from our findings based on both sets of data, we found common terms such as "positive" and "negative" mood emerged as we analysed the data. Similarly, to categorise

Table I.
A brief background of informants studied

Undergraduates						Postgraduates					
Subject (S)	Sex	Age	Educational qualification	Type of mobile device	Years of usage	Subject (S)	Sex	Age	Educational qualification	Type of mobile device	Years of usage
S1	M	22	Diploma	HTC One X	3	S1	F	26	ACCA	Samsung Note III	2
S2	F	21	Diploma	Samsung Advance	3	S2	F	26	Advanced Diploma	Samsung SIII	3
S3	M	22	STPM	Iphone	3	S3	M	24	Bachelor	Samsung Note I	3
S4	M	21	Diploma	Samsung Note II	3	S4	F	23	Bachelor	Samsung Grand	3
S5	F	21	Diploma	Iphone 5	4	S5	M	23	Bachelor	Blackberry	4
S6	F	22	A level	Samsung SIII	3	S6	F	29	ACCA	Samsung Note II	3
S7	F	22	A level	Samsung Note I	2	S7	F	26	Bachelor	Iphone 5	2
S8	F	20	A level	Iphone	3	S8	F	28	ACCA	Iphone 3	3
S9	F	22	Diploma	Samsung SIII	3	S9	F	28	ACCA	Samsung SIII	3
S10	F	23	Diploma	Iphone	3	S10	M	29	ACCA	Iphone	3
S11	M	23	A level	HTC One X	3	S11	M	24	Bachelor	HTC One X	3
S12	M	21	Diploma	Samsung Note I	3	S12	M	26	Bachelor	Samsung Advance	3
S13	M	21	A level	Samsung Grand	2	S13	M	26	Bachelor	Iphone	4
S14	M	22	Foundation	Samsung Note II	3	S14	M	23	Advanced Diploma	Samsung SII	3
S15	F	21	Foundation	Iphone 5	3	S15	M	28	Bachelor	Iphone	3
S16	F	21	Diploma	Samsung Note I	4	S16	M	24	ACCA	Iphone	4
S17	F	20	A level	Samsung SIII	3	S17	F	23	CIMA	Samsung SII	3
S18	F	21	A level	Samsung SII	3	S18	F	54	CIMA	Blackberry	3
S19	F	21	A level	Samsung Note II	3	S19	M	24	Bachelor	Blackberry	3
S20	F	22	Foundation	Iphone	2	S20	F	23	Bachelor	Iphone	2

"socialisation" (one of the variables in "subjective norm"), the influence of friends, colleagues and family members appeared to have an effect on users' preferred apps such as WeChat and Facebook. (see Table AI for a sample of how the data were categorised and unitised.) As the samples were small, common terms and themes emerged fairly quickly. As for the "hardware", from our preliminary analysis, we noticed more than half of the participants used Samsung smartphones followed by Blackberry as the next popular smartphone.

Analysis and discussion

Using Dey's (1993) theory-driven and data-driven categorisation, the analyses were based on TPB model as our basis for investigation and followed by the emerging themes. We found more commonalities than dissimilarities from both the UGs and PGs findings despite differences in terms of age, experiences and interest. The analysis of the results based on the sample of UG and PG respondents is given in Table AI. Whilst the results are based on the responses of all 20 UGs and PGs, where individual students have made notable comments, these have been identified and highlighted.

Attitude towards usage of mobile apps

A balanced-mood. As indicated in Table II, students experienced a more positive than negative mood as apps gave them the pleasure and elation to connect with friends and family especially with the additional built in features such as emotions and animations. This is consistent with Yang's (2013) findings where young American consumers (i.e. students) perceived mobile apps as a good source of fun and pleasure. However, participants also experienced frustration when they encountered software failure, slow connection, unreliable apps and sometimes bugs that caused the network to hang. Although both groups of participants expressed a balanced view of positive mood and negative mood, we noticed there were differences in various causations of annoyance and excitement. For example, three of the PGs participants/subjects commented:

> The existence of excitement of using mobile apps happened during the first few times upon exploring a new mobile app with good functions that have value-adding (S3).

> I am always in positive mood because apps utilize all my time meaningfully and decide my mood as well (S12).

> Some apps that are not properly designed (slow, bugs- irritations, hangs the phone) I will just delete them (S19).

Ethical conundrum. Our investigation revealed that users were fully aware of the consequences of using "illegal apps" and would either discontinue, uninstall, reset or opt for other apps substitutes which could provide similar functionalities and usefulness. In particular, we found PG groups of respondents expressed disagreement of using apps that invade privacy but used it cautiously if the apps are free and affordable. On the other hand, UGs felt guilty and yet continued using it knowing there was still lacking in intellectual protection in the country. As one UG respondent lamented:

> If I am in serious need of the functions provided by mobile apps, I guess that I will choose to continue using it regardless of the ethical issue, but I will feel uncertain, guilty and worried about the consequences that would come upon me later […] (S5).

Attitude towards behaviour (ATB)	Undergraduates	Postgraduates
Mood	"Using mobile apps can create *positive mood* as apps give us pleasure, elation, convenience, connectivity with friends and family, it is also very useful and easy to use with cute emoticons and animation. However, sometimes we also get *frustrated* with the slow connection, unreliability of apps, not meet our expectation, too many ads, and not well developed"	"Mobile apps help to create *joy/pleasure* with a touch of screen, convenience, useful, effective, user friendly, connectivity with friends and family as well as updates for personal benefits and values. On the contrary, users could get *annoyed* due to software failure, unwanted results, some apps not user friendly, unwelcome comments and worse experience is that it is caused by bugs or hang"
Ethical conundrum	"Feeling of uncertainty, guilt, and worried but continue to use especially in this country, there is still low level of intellectual property protection on smartphone applications. On the other hand, if there are other apps substitutes which could perform similar tasks and functions, will uninstall and discontinue using the illegal apps"	"Depends on consequences of and volume of people using apps. No conscience as it is free, cheap, use cautiously with security settings in place, save costs and useful. Discontinue using if it invades privacy or change settings to delete apps"
Frequency	"Generally, apps users use different types of apps more than 20 times a day"	"Apps users use various apps more than 20 times a day"
Familiarity	"Some apps which are more familiar among us are Facebook, Whatsapps, WeChat and Instagram and the frequency of usage 20-30 times per day. Facebook and Whatsapps were most commonly used apps for social networking as we stay connected with friends and family and also update on the course of study. With these apps, paid SMS are no longer feasible	"Familiar apps such as FB, Whatsapps, Instagram, Twitter, Candy Crush, Waze, WeChat and the frequency of usage are more than 10 times a day. In particular, FB and Whatsapps are the most commonly and frequently used apps. These are free and fast that replaced SMS, contain useful features for chit chat with friends and convenience"
Perceived proclivity	"Some particular apps heard of but risky (e.g. Bank), boring, lack of time and not used by friends so never try. Some apps have similar functions e.g. Whatsapps and WeChat, so only use Whatsapps"	"Have explored many apps but there are a number of apps that offered similar features and functions with the popular ones. E.g. Line, Kakaotalk, WeChat contain common features with that of Whatsapps which is the most popular apps among friends and family"
Perceived addiction	"Usually addicted to apps for social networking such as FB and Whatsapps. Also addicted to some apps for games such as HayDay and Candy Crush"	"Apps that have become part of our life such as FB, Whatsapps, Instagram and Candy Crush are fun, user friendly, self satisfaction updates and free"
Financial commitment	"Apps that required some form of payments, more often than not will not buy or subscribe, unless essential"	"Since there are many apps available from overseas particularly, very often, they can be downloaded at zero cost so no need to buy! Even if there is any sudden change, can always switch to other free apps"

Table II.
Illustrations of consumer attitude towards usage of mobile apps

(*continued*)

Attitude towards behaviour (ATB)	Undergraduates	Postgraduates
Reaction to internet speed	"Stability of connection is crucial to enable apps to function properly and avoid frustration. Slowness in Internet connection waste time"	"Slowness of Internet cause frustration, waste time, waste personal data by redo, cant view apps at the end stop using it"
Screen resolution and space	"Larger screen provide better and clearer effect, especially video and reading lengthy passages, enhance users' experience, save time scrolling up and down and of course, satisfaction"	"Prefer bigger screen as it provides comfort, better visual effect, clarity suitable for certain purposes such as video, games and reading. High resolution suitable of photo editing"
Power and processing	"This is important to users as many apps cannot run on older and less capable devices. Platforms also not compatible"	"Limited power and processing hinder accessibility to apps. Most devices consume power and require regular charging or with power bank as back-up. Inconvenience and incompatibility"
Proficiency in data entry	"It is essential to facilitate use of all capabilities but certain apps such as Waze needs less word input"	"Certain apps required proficiency in data entry but there are limited access and utility and hence depends on individual user and purpose"

Table II.

Both groups of respondents found using illegal apps as unethical and hence took all precautions not to get involved into trouble or face any untoward consequences (see Table II).

Frequency, familiarity and addiction. Individuals differed in terms of apps usage per day. Our results showed that an average apps usage per day was more than 20 times for both groups of respondents. As indicated in Table II, the most commonly and familiar used apps were Facebook, Whatsapps, WeChat, Instagram and various types of games (e.g. Candy Crush). These apps are free and fast and replaced SMS for daily social networking, contacting friends and families as well as for educational purposes. Two popular apps cited by both groups were Facebooks, Whatsapps and game apps which they seemed to have "addicted" and they claimed to have become "part of their life". Consistent with Yang's (2013) mobile apps study, game apps seemed to be one of the most popular category of apps meant for entertainment and enjoyment. The analyses further indicated that some apps they could have heard about them (e.g. Papago GPS Navigator, Shas am, Tango, Temple Run, Angry Bird, LINE, etc.) but never explored. Reasons cited were risky, boring, need payment, better substitutes and the most importantly the apps were not used by their friends.

Zero cost effect. The results (Table II) for both groups shared similar views on apps payment. None of the whole 40 participants agreed to subscribe or purchase any apps online. They claimed that most of the apps were originally from overseas and can be downloaded at zero cost.

One of the UGs participants (S4) expressed:

> I use apps mostly for entertainment purpose so I would rather pay for something which worth more and useful to me, such as physical items.

The general views expressed by the two groups were that most of the apps were free which they could easily download and use. Furthermore, they did not trust online payment or would rather go to shop to look for physical products. Clearly, these are

some of the reasons cited for not considering buying any apps or products via the use of mobile apps.

Stable connectivity and power. The two groups agreed that speed of internet connection was crucial to enable apps to function as desired. Limited power and processing could hinder accessibility to apps thus causing frustrations, waste time and personal data. As they also claimed, most mobile devices consume power and require regular charging or support by a power bank which could be inconvenient and incompatible.

Clear visual and spacious screen. As far as video, reading and games are concerned; the two groups shared a common experience and preferences in terms of better visual effect, save time, comfortable and overall satisfaction. One of the PGs participants commented:

> […] after using screen of 4.0 inches and 4.3 inches phone, I think I will opt for the phone which has 5.0 inches screen as keying in data and gaming are difficult for small screen […] (S16).

Data entry proficiency. The consensus views from both groups were that the skill was essential to facilitate use of all apps capabilities. Conversely, it also depended on individual users' needs and purpose as certain apps needed no word input such as navigation apps (e.g. Waze). So, proficiency in data entry may not be always useful or necessary as some apps created for dummies so long as one gets used to it (see Table II).

Subjective norms

Socialisation. As indicted in Table III, we found that friends and family members influences were paramount important to preference for different apps. According to the PGs common views, friends' pool of advice and apps pool among friends and families were important for communication, connection and socialisation. Clearly, this is consistent with Andrews *et al.*'s (2012) study which argued that people like to be contactable by friends and vice versa. One of the PGs commented:

> […] Pool of using the apps among friends is important because if you use the apps which others don't use then you will find it hard to socialise with them […] (S29).

Another PG participant (S3) highlighted that:

> […] I don't like to compare apps because I think technology changes very fast. Since my friends can give good recommendations, I will try to believe them.

In the context of socialisation, Castells *et al.* (2006) also posited that it was a common phenomenon to see teenage use their mobile phone to develop social skills and to have fun at anyplace and anytime.

Promotional inducement. The results revealed that it was a double-edged sword for apps advertisements and promotions. A general view from UGs was that ads and promotions provided them with the latest products information and updates which were useful although they might not decide to purchase them but would likely to consider buying if other friends used and recommended it. This was consistent with the findings of Bhave *et al.* (2013). On the other hand, PGs viewed apps promotions as useful and interesting as it did provide some freebies (e.g. movie tickets). However, some ads were not reliable and most of the time, users would tend to ignore or take no notice as it popped up whilst using the apps (see Table IV).

Subjective norms (SN)	Undergraduates	Postgraduates
Friends	"Allows socialisation, friends' recommendations and opinion important"	"For communication apps, friends pool of advice and apps pool amongst friends are important, otherwise you would not be able to use the common apps to communicate with friends. However, different people have different views, so friends' influence may be less important"
Family	"Family influence mostly on communication apps and their opinions are important"	"Apps allow sharing with family members, group chat, mentoring and socialising. It is a reliable source"
Advertisement and promotion	"Show latest things, information, and functions of apps but at the end of the day, decision is still ours. However, some advertisements are distracting, will take notice if constructive evidence, and consider if others using it"	"Yes, promotional apps can be useful and interesting as it does provide some freebies for example free movie tickets, it also provides some updates on how it works. However, some apps not reliable and most of the time seldom notice or pay attention to ads"
Judgement	"Most of the time own judgement based on apps functionality, suitability, and experience and sometimes seek suggestions from friends and family"	"Own judgement on apps based on convenience, user friendly, functionality, connectivity and recommendation by others. Apps can be downloaded and tried a few times and delete them if not used because it takes up space"
Observation	"Depends on whether apps are popular among users more so if they are recommended by trusted people, use reviews as guide, and rely on highly functional apps. Conversely, apps can be usually quite standardised so prefer to install and try a few times"	"Observing others enables learning to take place and will follow if others used well, may also discover new ways. On the other hand, one can based on own experience and ability in IT"
Joke sharing	"Use apps to share jokes occasionally only in social networking sites"	"Apps can be used to share and post funny pictures and jokes especially vide FB, Whatsapps and WeChat"
Chatting	"Apps such as Whatsapps, WeChat, Line or KakaoTalk are commonly and popularly used for social chatting with friends"	"Apps allow us to chat freely, conveniently anytime and anywhere, free of charge, use lots of relevant emotion icons"
Interactive games	"Popular games apps are X-Box, Candy Crush, Temple Run, Angry Bird are used frequently during free time"	"Used games often for fun, interact with friends, pass time and can be addicted"
Music	"Indeed listening to songs using apps (eg: YouTube, Kuwo, MyFM) is already part of our daily life especially when music helps refresh mentally"	"Use for relaxation as apps allow access to a variety of music and usually keep within the trial periods then delete as it takes up space"
Navigation	"Navigate information vide some popular mobile apps (e.g.: Waze, Google Maps, GPS) to find and know new places particularly is also increasingly becoming more important to us"	"Frequently used google maps and Waze for navigation purpose"

(*continued*)

Table III.
Illustrations of subjective norms and mobile apps

Subjective norms (SN)	Undergraduates	Postgraduates
Educational purpose	"Being students, mobile apps for educational purpose are crucial for learning and acquisition of knowledge. For example, Webster dictionary, e-books, healthy lifestyle etc."	"Use navigation apps to explore market shares, university ranking, wiki, research, translation, language learning, and dictionary"
Referencing	"Use relevant apps for referencing only occasionally"	"Use apps for referencing rarely but if yes only used for news, wiki and knowledge"
Enjoyment	"Enjoy interaction with friends and family members allow us to maintain friendship, relationship and most importantly the apps used are free of charge"	"Interacting with friends is always enjoyable and fun as apps offer variety of features and emoticons that are interesting and at zero cost"
News access	"Accessing news occasionally but I can always get first hand news from the apps and it is free of charge such as BBC news"	"Apps enable us to access news instantly and updated (e.g. BBC)"
Photography	"Definitely! All my friends also do the same especially through the use of Instagram. It also allows us to edit photos to enhance the effect"	"Apps allow easy accessibility to photos, edit photos enhance quality"
University intranet	"Using apps to check updates and the latest announcement by university"	"Keep updated with uni information, announcements, exams timetables, incoming emails"
Access books	"Mobile apps help us to access e-books but some prefers to read conventional books (hardcopy) instead of e-books as screen for smartphone is small"	"Apps can be used to access variety of books and magazines (eg Don Ding Reader and Text Reader). Conversely, using lap-top and library are preferred than apps"

Table III.

In the main, our findings therefore added to the previous studies conducted by Bauer *et al.* (2005) where entertainment and information values were the strongest drivers of attitudes towards mobile ads, whereas in Bhave *et al.*'s (2013) study, pop-up ads and video ads caused disturbance even though the ads had information value.

Judgement and observation. The two groups of participants agreed that they formed their own judgement on the use of apps. Their criteria for using apps depended on convenience, user friendly, functionality, connectivity and suitability. Friend and family member suggestions were equally important. One PG participant shared his experience as he opined that "apps can be downloaded and tried a few times; delete them if not used as it takes up space".

Observing how other used apps depend on whether apps were popular among friends or family members. It also allowed learning to take place and discover new products and knowledge. On the contrary, the UGs participants shared that users can base on own experience and IT skills instead of observation of others (see Table IV).

Chatting and joke-sharing. Using apps to chat has been a common phenomenon among users. Both groups of participants concurred that they used popular apps such as Whatsapps and WeChat for social chatting with friends and families anytime and anywhere. The use of relevant emotional icons has become part of their social conversations so as to make chatting more meaningful and interesting. The findings

Perceived behavioural control (PBC)	Undergraduates	Postgraduates
Advertisement prompt	"Advertisement on apps not convincing so need to ask friends' opinions. It can be annoying but used them for information purpose. Most of the time not trusted as there might be scams"	"One may choose to ignore ads, but majority would likely to think wisely, conduct research, and assess its functionality and reliability. Any suspicious sites ignore them"
Promotional messages	"Do not use promotional messages as a basis of making decision. Can be scams so did not trust them"	"Most promotional messages not convincing, cannot be trusted as they might be scams or bugs"
Regret	"Should consider a lot of factors before purchase so that one would not remorse when the products not suitable and pricey"	"Would regret if purchase waste money and time, not up to expectation may well buy from shops outside. Alternatively, avoid it in the future or resell if found unsuitable"
Repeat	"Experience informs future decisions, do more research, alternatively, may try other more reliable sites"	"Likely to repeat if promotional items too attractive to resist from buying it but most of the time more cautious in future browsing. One could also tend to be forgetful and hence repeat mistakes. Ideally, seek friends' recommendations"
Self-confidence	"Rely on subjective perception and product knowledge. Past experience of using apps provide source of confidence"	"Learn to deny if apps promotional messages that are inappropriate"
Product knowledge	"Would likely to do a research on apps usefulness, getting some prior knowledge useful before using apps. One may not use own product knowledge but refer to feedback from current users or friends, ratings of apps is also important"	"Apps are easy to use so can easily gathered useful information. By so doing, one can avoid unnecessary products. However, some users might have to gather multiple sources to use apps but most important, friends' recommendations matter"

Table IV. Illustrations of perceived behavioural control

also show that UG participants shared less jokes with their counterparts compared to PG participants. As commented by one PG participant:

> […] I use apps to share and post funny pictures and jokes especially via FB, Whatsapps and WeChat […] (S3).

Mental relaxation and perceived enjoyment. Table IV also revealed that playing interactive games and listening to music were some of the apps used by participants from the two sets of data. The UGs users often used some popular interactive games (e.g. X-Box, Candy Crush, Temple Run) during free time. Whereas PGs participants commented that they played games for fun and pass time. Both groups also used apps (e.g. YouTube, Kuwo and MyFM) to listen to music for mental refreshment and relaxation. The perceived enjoyment of listening to music and playing games were found to be ubiquitous among young mobile users from different countries as affirmed in previous mobile services studies (Liu and Li, 2011; Kim *et al.*, 2008; Hill and Troshani, 2010; Yang, 2013).

Educational benefits. Generally, common apps used for educational purposes were dictionary, e-books, BBC news, wiki and Webster. Both groups of participants

encountered similar experiences as they viewed news access, e-books and dictionary as increasingly important as they could easily retrieve them from apps (see Chen and Denoyelles, 2013). In addition, they also used the university intranet to keep themselves updated with exams timetables, announcements and e-mails. However, the tendency and time commitment to these educational apps were much less compared to games, social network and entertainment apps with the exception of dictionary apps.

Perceived behavioural control

Advertisement and promotional vulnerability. Both UGs and PGs believed that most of the apps advertisements and promotions could be suspicious and might contain scams or bugs. One interesting finding was that the PGs suggested that users should ignore ads and conduct research to assess its functionality and reliability before the purchase decision. By doing so, they were not being easily influenced by such ads and promotional messages which could be psychologically induced (Table IV).Clearly, the consensus views from both groups were that they would not easily influenced by mobile ads to purchase any products online.

This finding appears to show a stark contrast with the mobile apps study conducted by Jain and Pant (2012) in India. Interestingly, they found that Generation Y had a high spending habit, high aspirations and desires. Similarly, other studies such as Jurisic and Azevedo (2011) also revealed that Generation Y had high purchasing power and Xu (2007) found that Generation Y spent money quickly on consumer goods and personal services.

Remorse and repeat. Remorse for the purchase of any apps products applied to those which wasted money and time or not up to expectation – a shared view expressed by both UGs and PGs participants. It was deemed advisable to consider some pros and cons before proceeding to close any deal. As opined by one of the UGs participants:

> […] experience informs future decision, carry out research or try other more reliable sites […] (S1).

These findings uncovered some similar purchase elements such as inherent search, experience and credence qualities of products as evidenced in previous research (Lee and Tan, 2003; Engel *et al.*, 1995; Zeithaml, 1981). Since online shopping is a comparatively new activity and are still perceived as riskier than terrestrial ones (Laroche *et al.*, 2005), purchasing apps products on virtual platform would be seen as a normal behavioural fear.

The results also revealed two other possible reasons mobile apps users might repeat the mistake. First, the promotional items were too attractive to resist buying the same product. Second, forgetfulness is another possible cause of repeating the same mistake if not careful (Table IV).

Self-confidence and product knowledge. As shown in Table IV, UG participants admitted having self-confidence and would likely overcome the temptation to buy even though the ads could be very alluring on first impression. Self-confidence could also be gained through subjective perception and product knowledge as well as past experience. As quoted by one of the UGs participants:

> My past experience of purchasing from a particular site will be my source of confidence and my most important priority in making decision instead of those promotional tools (S8).

Finally, we asked participants about whether they needed product knowledge to use a particular app. Reasons cited by both set of participants were that: do research on the usefulness; feedback from current users; rating of apps; and friends' recommendations. Gathering multiple sources of information of using apps was seen essential to utilise apps to the maximum.

Implications for theory and practice

Theoretical implications

Whilst there are limited studies conducted on using TPB and connecting it to mobile apps using an exploratory approach, this study has much to prove its novelty value. Although we adapted a behavioural model to investigate the proclivity of how and why consumers (in this case UGs and PGs) react to the pattern of mobile apps usage (with some real differences emerging not identified in previous studies) the ultimate outcome was mixed leaving more conclusive evidence to emerge through further research.

In terms of the construct "attitude towards the use of mobile apps" we found very few differences between UGs and PGs on nearly all the variables, although there were some surprises. For example, we conjectured consumers of mobile apps would have been in a positive mood in terms of experiencing joy, elation and pleasure, but the findings proved the other way round, citing various reasons for positive and also negative moods. When mobile users were in their negative mood, they were reluctant to continue using the apps. So it was not planned and hence, intention may not lead to actual behaviour. These findings are consistent with those of Yang (2013), but our study found that there were differences in the causes of mood changes between the two groups. Whilst UGs could experience a negative mood due to what they perceived as "underdeveloped" apps and "interference" by advertisement breaks, PGs got more annoyed by software and hardware failure. In terms of ethical behaviour, although both groups felt guilty in downloading illegal apps, there was a sense of "getting away with it, if not caught", confirming the findings of Phau *et al.*, 2014. With accessing apps some 20 times per day, especially social websites, both groups admitted to an addictive behaviour. In terms of payment, both groups wished not to pay, so downloaded free apps, or those generated from overseas. Besides, they did not trust payment online, confirming the need for trust (Ku, 2012). Physical aspects like speed of connectivity, clear and larger device screens were seen essential but there was concern over power consumption with some apps, necessitating more device recharging. Both groups recognised that a certain degree of skill was required to operate the apps to full potential. In summary, the criteria for using apps depended on convenience, user friendly, functionality, connectivity and suitability.

As for the construct "subjective norms", there were more differences overall between the two groups specifically in terms of the variables "friends", "family influence", "promotional inducement", "observation" and "news access". As for "friends" PGs were less influenced by these in their behaviour than were UGs. As for "family influence" the UGs found this to be more important than the PGs. On "promotional inducement" the UGs stated that ads and promotions provided them with the latest products information and updates which were useful although they might not decide to purchase them but would likely to consider buying if other friends used and recommended it, confirming the findings of Bhave *et al.* (2013). On the other hand, PGs viewed apps promotions as useful and interesting as it did provide some freebies (e.g. movie tickets). In the main, our findings, therefore, added to the previous studies conducted by Bauer *et al.* (2005) who found that entertainment and information values were the strongest drivers

of attitudes towards mobile ads. Our research suggested that whilst entertainment and information were useful in driving attitudes towards ads, these alone were insufficient. For UGs, friends and family had an influence on attitudes and therefore, apps purchase, whereas PGs looked less to friends for support and preferred to do further research on the apps as well as avail themselves of promotional freebies. Both groups were generally sceptical of both advertising (e.g. pop ups) and promotion especially the latter, which they cited could be either scams or contain bugs. As for "observation" by others as an influence on apps behaviour, the UGs were more likely to be influenced by trusted people but not necessarily the case for PGs. Finally for 'news access, UGs used apps occasionally for this feature but PGs used the feature more often for instant news and knowledge update. These differences are most likely to reflect the increasing "maturity" of PGs compared to UGs. As for educational use, both groups used apps for this purpose, however, the tendency and time commitment to these educational apps were much less compared to games, social network and entertainment apps with the exception of dictionary apps, confirming the findings of Bomhold (2013) and Song and Lee (2012).

As for the construct "perceived behavioural control", this construct was the one where the main differences between the two groups of students occurred and occurred in the variables "advertisement prompt", "repeat", "self-confidence" and "product knowledge". Our findings suggested that both sets of students were not easily influenced by advertising and promotional messages and were even afraid that they might contain scams and bugs and this has numerous practical implications as suggested below. However, whilst UGs did not trust the advertising messages, the PGs were inclined to trust these for information, but not necessarily as an only source for the basis of use. This was slightly contrary to the PG response to "repeat" (repeat use). Here the PGs did indicate that repeat use was likely if the promotional message was strong, whereas UGs indicated that they relied on past experience. In terms of "self-confidence" the UGs indicated that perception and product knowledge, coupled with past experience influenced their self-confidence in use of apps, whereas PGs would not use an app if the promotional message was deemed inappropriate. Finally, on "product knowledge" the UGs suggested that they would like to conduct extensive research, perhaps seeking advice from friends and or current users rather than rely entirely on their own product knowledge whereas PGs were more adventurous in the use of apps as they found them quite easy to use. These findings most likely reflect the fact that PGs felt more "confident" in their own judgement than their lesser experienced UG colleagues who sought numerous "props" to their decision making. As for post purchase experience, both groups felt "remorse" if the app did not live up to expectations, (consistent with Howard and Sheth's, 1969 post purchase dissonance), however, this was offset by the students "self- confidence" in the purchase of the app in the first place, no doubt reinforced by the influence of friends and family, confirming the findings of Wei and Lu (2014).

In conclusion, we found few differences between the two groups of students on the construct of attitude towards the use of mobile apps, but more on the two constructs of subjective norms and perceived behavioural control, the latter where most differences were apparent. These findings seemed to confirm some of the findings of Song and Lee (2012) but contravene the findings of Andrews *et al.* (2012) as our participants from different streams seemed to share common voices, emotion and experiences in using apps. However, the "perceived behavioural control" result in particular would likely to have profound implications on marketing initiatives and practices, in particular, promotional messages that were perceived to be annoying and irritating (Parreno *et al.*, 2013). These are discussed in the next section.

Practical implications

From a practical point of view, our research has a number of implications. Whether to engage or not to engage in using mobile apps, Ajzen's (1991) argued that normative beliefs play a strong influence on consumer intention to use the product. In this context, our findings of how social pressure impacted upon intention to use apps corroborated his contention and Yang's (2013) research on young Americans. Users of mobile apps were greatly influenced by friends, classmates, teammates and family members mainly for socialising, gaming, photography, education and communication. Hence, the intricacies of how social pressure influences mobile users' intention and decision making of using which and what apps, and why, of numerous apps, only certain common apps were used, warrant further investigation. However our findings differed somewhat from those of Wei and Lu (2014) and Bhave *et al.* (2013), for example, who generally treated the "young" as a homogenous group. Our results showed there were notable exceptions amongst the variables as indicated in the theoretical implications cited above. Our results were, therefore, more in line with the findings of Persaud and Azhar (2012) who suggested that there is a need to treat consumers as more heterogeneous. However, unlike the findings of Persaud and Azhar (2012) we found even a difference between UGs and PGs in the age group 18-25. In this latter regard marketers must, therefore, be careful not to treat UGs and PGs as homogenous but be more nuanced in their marketing and promotional efforts. For example whilst PGs may use advertisements as a useful source of information, UGs tended to distrust them completely. This might also serve as a guide for content providers not to offer apps features and functions that seemed to resemble the existing apps (e.g. LINE and WeChat). On this note, our findings also highlighted more behavioural congruence than contrast among the age group ranging from 20 to 29 years (UGs vs PGs) hence, warranting future apps content improvement and innovation. In addition, friends, families and other close reference groups were very important as sources of information on apps. This has further implications for apps marketers, including the indication that social media and word of mouth advertising may be much more effective media for promoting and selling apps. These important media should be added to the media list of Bhave *et al.* (2013).

Consumers' control beliefs relied heavily on internal and external influences. Our findings revealed that mobile users were not easily influenced by advertisements and promotional messages and were able to overcome their temptation to purchase any product online. They not easily made an impulse buying decision unless their peer recommended it which would also help them to reduce their financial burden. Moreover, they found marketing or advertising messages annoying, irritating, time-consuming and redundant. Contrast to this finding, previous studies have confirmed that there was relationship between mobile phone marketing acceptance and consumer age, majority of which were under 25 years of age (e.g. Barwise and Strong, 2002; Roach, 2009; Merisavo *et al.*, 2007). Hence, based on this unique proposition, business organisations and marketers must take heed of the variations in perceived consumer attitude and norms exhibited by consumers from different countries, in other words, "one size does not fit all" globally.

Users also claimed to have self-confidence and product knowledge in using and exploring new apps based on their experience and knowledge. It was interesting to note that our research debunked the fact that mobile users were reluctant to use new apps or, apps substitution has much to do with getting-used-to-it syndrome and habit. Once

users are familiar with the existing apps, they would be reluctant to try a new app if it offers near-to similar features and functions. Marketers should note this finding. This was unexplored, based on our literature search.

Limitations

The qualitative research described here has no exception to limitations in representation and sample homogeneity. As the study was based on one institution's participants from UG and PG programmes, it would not be representative of the population in Malaysia. Future researchers should reorient their focus on heterogeneity and geographical spread of respondents in addition to a follow-up positivist parameter, perhaps a cross-cultural study delineating on different demographic characteristics might generate a more meaningful result.

Conclusion

Our study, based on constructs from the TPB, highlighted the fact that attitude towards the usage of apps, subjective norms and perceived behavioural control were very important constructs in the use, type and behaviour of mobile apps by UGs and PGs. Moreover, unlike a number of previous studies, our research showed there were many nuanced differences between the UGs and PGs in the variables making up the subjective norms and perceived behavioural control norm constructs but not so much the perceived attitude towards apps construct. This has implications for both theory and practice. Further quantitative research on a larger sample and in a cross-cultural context may reveal if this is a Malaysia wide or specific phenomenon. The authors, themselves, intend to conduct such research.

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Further reading

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(The Appendix follows overleaf.)

Appendix

Constructs	Units of data: UG ($n = 20$)	Units of data: PG ($n = 20$)	Number of category: UG ($n = 20$)	Number of category: PG ($n = 20$)
(a) Perceived attitude towards mobile apps (PATA)				
PATA-PM-MA	Free and enjoy, delighted and pleasure, perceived usefulness of using mobile apps	Joy, easy, convenient, useful and user friendly	14	11
PATA-NM-MA	Full capacity caused slowdown in using mobile apps, sometimes apps not up to expectation and not user friendly	Annoying, software failure, unwelcomed comments or conversations, some not user friendly	9	7
PATA-ED-MA	Significant ethical concern, continue to use but with some quilt sometime, low level of intellectual property protection so ok to use the apps	Depend on consequences and volume of people using, continue to use it cautiously with the highest security settings in place	7	7
PATA-F-MA	On average, use different popular apps such as Whatsapp, Wechat, LINE, Facebook 10-15 times a day	On average, use different apps between 10 and 15 times a day, example of popular apps used are FB, Waze, Whatsapp and Wechat	15	16
PATA-A-MA	Addicted to social networks using common ones, e.g. Whatsapp and Wechat	Addicted to common apps used by friends, colleagues and family members such as Instagram, Whatsapp and FB	9	7
(b) Perceived subjective norm (PSN)				
PSN-F-MA	Mobile apps allow socialisation with friends and families, recommendations and opinions important to users	Friends recommend interesting apps, use LINE and Wechat to contact each other even in foreign countries	18	10
PSN-C-MA	Apps that provide users to connect to colleagues conveniently and enable wider reach	Use Whatapps or LINE to connect with colleagues more for work or socialising	9	7
PSN-FM-MA	Mostly on communication apps, their opinion matter and also keep in touch with family members outstation	Family members advise and teach how apps works and also more for group chat	12	8
PSN-OJ-MA	To some extent not totally relied on friends. Sometimes can based on functionality and suitability, also experience matters	Try new apps for a few days, delete if not suitable. Also refer to reviews from other mobile users	20	16
PSN-O-MA	Observe what apps others are using, the higher the amount of users usually indicates that the apps are highly functional	Friend used apps Waze while driving I followed, but depends more on own experience and IT skills and expertise	11	7
(c) Perceived behavioural control (PBC)				
PBC-A-MA	Only those that users subscribed to and assess the usefulness, if not convincing ask friends' opinion. Do not trust ads, can be scams and annoying	Do not trust advertisements, think wisely before purchase and do some research	18	10

Table AI.
Mobile apps: categorising and unitising of users' data (sample)

(*continued*)

Constructs	Units of data UG ($n = 20$)	PG ($n = 20$)	Number of category UG ($n = 20$)	PG ($n = 20$)
PBC-PM-MA	Do not trust promotional messages as they could be promotional tactics, scam and not effective	Do not trust promotional messages as apps might have bugs	19	10
PBC-R-MA	Likely to suffer customer remorse if bought something that does not suit users	Regret if apps not worth the value, waste of time and money	7	8

Notes: (a) PATA, perceived attitudes towards apps; PM, positive mood; NM, negative mood; ED, ethical dilemma; F, familiarity; A, addiction; (b) PSN, perceived subjective norms; F, friends; C, classmates; FM, family members; OJ, own judgement; O, observation; (c) PBC, perceived behavioural control; A, advertising; PM, promotional message; R, regret

Table AI.

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