

The role of demographic and motivational factors on mobile commerce usage activities in South Africa



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Dates:

Received: 24 Nov. 2016

Accepted: 11 Dec. 2017

Published: 19 Mar. 2018

How to cite this article:

Cullen, M. & Kabanda, S.K., 2018, 'The role of demographic and motivational factors on mobile commerce usage activities in South Africa', *South African Journal of Information Management* 20(1), a817. <https://doi.org/10.4102/sajim.v20i1.817>

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Background: Many studies have examined the mobile commerce phenomenon and most of these have focused on understanding the organisational and environmental factors that affect its adoption. Few have examined how an individual's characteristics and their perceived motivational appetite affect their mobile commerce usage and specifically the activities they engage in.

Objectives: This study examines the role of demographics (individuals' characteristics) and motivational factors on mobile commerce usage activities from the South African perspective.

Method: An objective approach and a positivistic stance were followed. The research model and instrument from earlier studies by Chong (2013a) were contextualised to suit this study. Data collection was done through an online questionnaire, 88 responses were received and 81 used for data analysis.

Results: The findings show that age is significantly related to mobile commerce transactions, and one's education status influences the following mobile commerce usage activities: transactions and location-based services. One's gender influences how one uses mobile commerce. A significant relationship between all three motivational variables and mobile commerce usage activities is evident.

Conclusion: The findings provide the financial services industry and providers of mobile commerce offerings with a better understanding of the relationships between customer demographics and the mobile commerce activities they engage in. An additional variable of customer income has been identified for future studies to better understand the relationship.

Introduction

Mobile commerce (m-commerce) refers to any transaction conducted on a wireless handheld device (Chong 2013b) and is postulated to have a significant influence on business and society (Bhatti 2015). For example, organisations can benefit from increased revenues and profit (Wu & Wang 2005) whilst end users benefit in terms of 'ubiquity, convenience, localization and personalization [*sic*]' (Phuangthong & Malisawan 2005:1). Mobile commerce users engage in various activities such as content delivery, commercial transactions, location-based services, emergency purposes and entertainment (Chong 2013a; Ngai & Gunasekaran 2007).

Mobile commerce has provided several benefits to most organisations in developing countries. For example, in South Africa, the translation industry states that they have:

become mobile professionals, that is, they are not confined by traditional geographical and locational boundaries, but can interact with clients at any time and thus are able to create workspaces anywhere. (Selyer & Mugova 2017:1)

Donner, Marsden and Gitau (2011) identified utility, entertainment and connection as the various m-commerce usage activities in South Africa. Mobile commerce in South Africa and other developing countries could potentially transform these economies because of the contextual characteristics these economies present (Joubert & Van Belle 2013), namely a demographic of low personal computer (PC) and broadband access, a high and growing smartphone penetration percentage, steady advancements made in mobile technology and services and the increase in number of individuals who only access the Internet and its many related services such as instant messaging, and m-commerce, on a mobile device (Kakihara 2014; Kreutzer 2009). This is significant as m-commerce offers many benefits, both for the organisation providing m-commerce service and for end users consuming it. However, for organisations to capitalise on these benefits, they need to understand their customers' needs and be informed of what factors influence an individual towards a particular m-commerce usage activity.

Read online:



Scan this QR code with your smart phone or mobile device to read online.

Many studies have focused on organisational and environmental factors that affect m-commerce adoption, but few have examined how an individual's characteristics and their perceived motivational appetite affect their m-commerce usage and specifically the activities they engage in. This paper is based on Chong's (2013a) study, which examined the relationships between demographic and motivational variables with m-commerce usage activities. The purpose of this study is to contextualise Chong's work to South Africa and provide a better explanation of how demographic and motivational factors influence m-commerce usage in South Africa. In so doing, the study seeks to contribute towards a better explanation of how demographic and motivational factors influence m-commerce usage in South Africa. The findings would provide the financial services industry and providers of m-commerce offerings with a better understanding of the relationships between customer demographics and the m-commerce activities they engage in, to improve and customise their product offerings.

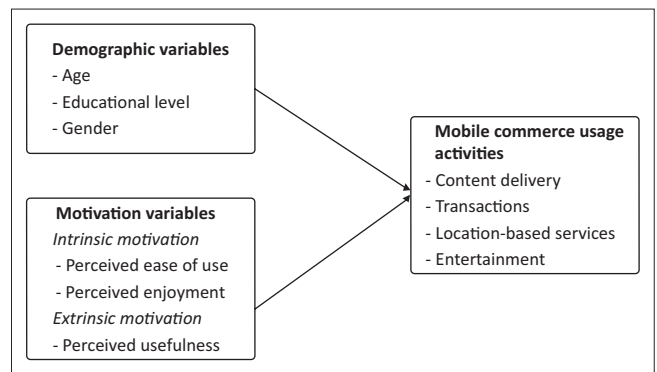
The rest of the paper is structured as follows: The 'Conceptual Background' section will provide a literature review on m-commerce, specifically in a developing country context. This is followed by the 'Methodology' section, which discusses the research approach, paying attention to how the data were collected and analysed. Then, the field research findings are documented in the 'Findings' section. An extrapolation of the field research findings in the context of the literature is made in the 'Discussion' section. The conclusion concludes and provides recommendations and future research work related to this study.

Conceptual background

M-commerce in developing countries

Developing countries are typically characterised by a high cost of Internet access and low PC and broadband access when compared to developed countries (Chetty et al. 2013; Kakihara 2014). The study by Touray, Salminen and Marsu (2013) on Information Communication and Technology (ICT) barriers and critical success factors in developing countries calls out (among others) technical constraints such as poor network reception and slow Internet connection, education and skills, which indicate poor literacy skills and lack of ICT skills; economic issues such as low per capita income; and socio-cultural issues such as language barriers. Overcoming widespread poverty is still a major challenge, specifically in most African countries (Wentzel, Diatha & Yadavalli 2013).

The penetration of mobile phones in developing countries has dramatically changed business and individual communications and is thought to have a positive effect on the interaction. According to Budree and Williams (2013), mobile phone penetration is high in developing countries, even in rural settings where people might be deprived of basic services such as water and electricity. This has resulted in many studies that have attempted to understand the



Source: Chong, A.Y.L., 2013a, 'Mobile commerce usage activities: The roles of demographic and motivation variables', *Technological Forecasting and Social Change* 80(7), 1350–1359. <https://doi.org/10.1016/j.techfore.2012.12.011>

FIGURE 1: Research model.

phenomenon in the developing context, such as Donner et al. (2011), who identified the various m-commerce usage activities in South Africa. Their findings show that utility, entertainment and connection were the main m-commerce usage activities. Chong (2013a) identified content delivery, transaction, location-based services, emergency purposes and entertainment as the main m-commerce usage activities in China. Similar findings were reported by Pagani (2004) and Ngai and Gunasekaran (2007).

In the existent literature of m-commerce there has been limited focus on the role of demographics and motivational factors on adoption in the developing countries, specifically in Africa. This study, therefore, uses the model by Chong (2013a) to examine the role of demographics and motivational factors on adoption in South Africa. According to Chong, as shown in Figure 1, motivation and demographic variables are positively related to the usage of m-commerce activities (e.g. content delivery, transactions, location-based services and entertainment).

Demographic factors

The most examined demographic indicators are gender, age and education. Past studies have confirmed that there is a strong and negative correlation between age and mobile Internet use (Chong 2013a). For example, in Taiwan and the United States, mobile Internet usage is more prominent in young males, with Taiwan showing strong usage in young males between the ages of 21 and 40 years old, and the United States with males between the ages of 18 and 35 (Okazaki 2006). There is a similar trend in Kenya, where m-commerce use is more pronounced among the younger generation (Hayden & Webster 2014).

In the South African context, 'adolescents and the youth are the first adopters of mobile technology, with 72% of 15- to 24-year olds having a cell phone' (Beger, Sinha & Pawelczyk 2012:3), the majority of them, who are students, owning a mobile phone 'in the category of smartphones, bearing modern features that facilitate instant messaging, exchange of data and information as well as speedy access to information via the Internet' (Shava, Chinyamurindi &

Somdyala 2016). As such, students reported the intensive use of mobile phones to access mobile Internet applications (because it is considerably more accessible), at a far greater level than they report using desktop computers to access the Web (Kreutzer 2009).

Chong (2013a) reports that age negatively affects m-commerce activities, specifically in terms of content delivery, transactions and entertainment. This is partly because of the fact that the elderly are usually forgotten during product design, development and marketing, and thus their needs are not catered for in the final consumption of the product (Mallenius, Rossi & Tuunainen 2007); or the fact that there is a negative relationship between age and Internet self-efficacy (Chung et al. 2010). For example, as per the South African mobile consumer report (Mobility 2011), 'usage of mobile banking peaks in the 26–34 age group, at 41%, and drops to 11% in the over-45 group', suggesting that age is a factor in m-commerce usage. Not all of these findings are supported fully in the literature, however; specifically, Hew et al. (2016) found that age did not have any moderating effects on mobile entertainment services, emphasising that other factors such as quality of service play a bigger role when explaining usage. For the purposes of this study, it is hypothesised, as in Chong (2013a), that:

H1: age is negatively related to m-commerce usage in terms of content delivery, transactions, location-based services and entertainment.

Studies such as those by Teo (2001) and Chong (2013a) have confirmed that education positively affects m-commerce usage, particularly in transaction-based activities and location-based services. Chong's (2013a) study also highlighted that education plays no significant role in content delivery such as messaging and downloading, or entertainment purposes such as listening to music. Teo (2001), however, found that education has a positive influence on general Internet usage and it is therefore hypothesised, as in Chong (2013a), that:

H2: educational level is positively related to the usage of m-commerce in terms of the following activities: content delivery, transactions, location-based services and entertainment.

Finally, a number of previous studies have examined the role that gender plays in Internet usage and online shopping behaviour (Hasan 2010; Hwang 2010; Okazaki 2006). Findings from these studies are inconsistent, with some results showing males as being more dominant in mobile Internet adoption, with a wide population using it for both personal and work-related activities, whilst others did not show any significant difference between males' and females' mobile Internet usage (Okazaki 2006). Hasan (2010) argues that the biggest difference between females and males is in their cognitive attitude, explaining that males prefer the utility of online shopping more so than females. Tecnológica et al. (2015) suggest that females prefer interpersonal communication rather than a technology-based medium. Stork, Calandro and Gillwald's (2013) study on mobile

Internet use in Africa concluded that mobile Internet usage is fairly even between genders in Namibia and Tanzania but is biased towards males in Uganda, Ethiopia and Rwanda because females in these three countries were less educated and had lower disposable income than their male counterparts. Donner et al. (2011) highlighted gender differences in ICT usage in South Africa and found that although women had access to Internet-enabled smartphones, they relied on a male counterpart such as a brother, husband or son to make use of mobile Internet services, citing a lack of awareness of the capabilities of their devices, or finding the tasks too complicated to perform. Whilst Donner et al.'s (2011) research was aimed at a particular demographic of women, specifically those in an informal settlement, other studies have also made reference to the significance that gender has on mobile usage patterns, such as North, Johnston and Ophoff's (2014) study on South African university female students, who were found to use their mobile phones more for safety and socialising than their male counterparts. The South African mobile consumer report (Mobility 2011) also confirms that male usage of mobile banking services far outpaces that of females, at 56% versus 44%. Gender does, therefore, have an influence on Internet use and we, therefore, hypothesise, as in Chong (2013a), that:

H3: males are more likely to use m-commerce for the following activities: content delivery, transactions, location-based services and entertainment.

The role of motivational variables

The motivational model by Davis, Bagozzi and Warshaw (1992) posits that Internet users' behaviours differ depending on whether their motivation is extrinsic or intrinsic. Most studies have claimed that intrinsic motivation is an important driver of employee attitudes and, in most cases, is substantively associated with both employee satisfaction and turnover intention (Cho & Perry 2012). Padilla-Meléndez, Del Aguila-Obra and Garrido-Moreno (2013:307) see intrinsic motivation as the performance of an activity for no apparent reason other than the process of performing it. Such intrinsic motivational behaviour is evoked from the feeling of pleasure, joy and fun – commonly characterised as one's perceived enjoyment of the activity (Lee, Cheung & Chen 2005:1099). Perceived enjoyment is thus a key intrinsic motivator for technology adoption and usage, and it 'represents the perceived enjoyment linked with the use of a particular technology in itself, rather than the potential performance outcome of using such a technology' (Ayeh, Au & Law 2013:134).

Ramayah and Ignatius (2005) indicate that perceived ease of use and perceived enjoyment were positively related to intention to shop online in the Malaysian context. Furthermore, perceived ease of use ($\beta = 0.78, p < 0.01$) was found to be a significant predictor of perceived usefulness.

In South Africa, Dlodlo and Mafini (2013:6) found perceived enjoyment to be statistically significant and correlated

positively with frequency of m-commerce usage among consumers. The authors concluded that:

the higher the levels of fun and excitement that are derived by Generation Y consumers from utilising m-commerce technologies, then the higher the frequency of use will be of that mobile platform for commercial transactional purposes. (p. 6)

On this basis, we hypothesise, as in Chong (2013a), that:

H4: perceived enjoyment is positively related to m-commerce usage.

Padilla-Meléndez et al. (2013:307) define extrinsic motivation as the performance of an activity for achieving valued outcomes that are distinct from the activity itself, such as improving job performance, pay, etc. According to Dysvik and Kuvaas (2013:2), 'employees who are extrinsically motivated work harder to attain a desired consequence or to avoid a threatened punishment'. Such employees tend to be driven by their perceived values, which explains the utility values for system usage, benefits derived and perceived ease of use, which is a predictor for an individual's intention to adopt and use a system. Previous studies have shown that perceived ease of use has a positive correlation with behavioural intention, both in a direct effect as well as an indirect effect through perceived usefulness or benefits (Bhatti 2015). For example, Erasmus, Rothmann and van Eeden (2015) examined technology acceptance within a South African user environment and their findings show:

a significant path from perceived usefulness of the information system to attitudes towards and behavioural intentions to use it. Furthermore, behavioural intention to use the system predicted actual use thereof. (p. 1)

They concluded that perceived ease of use indirectly affected attitudes towards and behavioural intentions to use via perceived usefulness of the information system. Whilst examining retail banking customers' attitudes towards Internet banking services in South Africa, Maduku (2013) found perceived usefulness and perceived ease of use were some of the factors that explained attitude and consequently use. On this note, we hypothesise, as in Chong (2013a), that:

H5: perceived ease of use is positively related to m-commerce.

H6: perceived usefulness is positively related to m-commerce in terms of the following activities: content delivery, transactions, location-based services and entertainment.

Methodology

The study followed an objective approach and was positivistic in nature. The implication here is that we do not seek to give explicit recognition to the world of consciousness and humanly created meanings (Ngwenyama & Lee 1997) and acknowledge that the data that is gathered will be value-free data (Walsham 1995:376). Research participants in the study were the general public who had previously or were currently engaged in m-commerce activities. This was one of the requirements to participate in

the study. Attention for the survey was garnered through sharing it online on social networks, namely LinkedIn, Facebook and Twitter, from the researcher's personal profile as well as through an email campaign and the distribution of physical copies. The database used for the email campaign was the researcher's address book. Physical copies were distributed in Wynberg, Cape Town, from two large public transport hubs and a large shopping centre in its vicinity because of its high footfall location. Having access to online resources allowed the survey to reach those members of the public who were not physically located in the Western Cape region of South Africa, which is where the researcher was based. Then, self-selection sampling was used to allow the public respondents to choose to take part in the study of their own accord.

Data collection was done through a survey questionnaire. The research instrument was developed using the constructs identified in Figure 1 as presented in Table 1. The instrument has been tested in prior research by Chong (2013a). The research instrument was structured as follows: Section 1 of the questionnaire captured the kinds of m-commerce activities that the respondents engage in; Section 2 captured the influence of motivational variables on m-commerce usage and Section 3 captured demographic variables. Section 1: M-commerce Usage Activities and Section 2: Motivational Influences captured numerical data against a five-point Likert scale. The research instrument was piloted on several individuals familiar with m-commerce to gather their feedback. The intention of the pilot test was to ascertain that the questionnaire was clear and that it was not taking too long to complete. Feedback received was consistent across the group, confirming that the survey could easily be completed in under 10 min, but more importantly that the questions themselves were not easy to understand and left a lot to interpretation. Thus, a number of questions were rewritten with the focus on plain English descriptions to eliminate respondents' understanding the questions in different ways. Then, the process of data collection commenced. Completed survey questionnaires were submitted online anonymously on surveymonkey.com from members of the public.

Each response was allocated a unique reference number allowing for easy data preparation and analysis

TABLE 1: Research instrument design.

Section	Constructs	Question	Related hypothesis
1	Content delivery	Q1	H1-H6
	Transactions	Q2	H1-H6
	Location-based services	Q3	H1-H6
	Entertainment	Q4	H1-H6
2	Perceived ease of use	Q5	H5
	Perceived usefulness	Q6	H6
	Perceived enjoyment	Q7	H4
3	Gender	Q8	H3
	Age	Q9	H1
	Education	Q10	H2

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in statistics tools. In total, 88 responses to the questionnaire were received. Seven of the responses were only partially completed, leaving 81 for data analysis. The average time to complete the survey was 10.3 min; however, there were a few outliers taking some 30–40 min, with the most extreme taking nearly 3.5 h. Removing the few outliers brought down the average time to complete the survey to 5.5 min. Social media proved to be the most successful channel for gathering responses. The Facebook post used to gather most of the data was liked three times and shared seven times by respondents throughout South Africa. Similarly, the LinkedIn post and Twitter posts received two and one likes, respectively. The combined social media reach attracted a total of 46 responses. The email campaign brought in 30 responses. No one completed a physical paper questionnaire, but 12 responses were generated from distributing a web link with the physical paper, indicating that people prefer to complete surveys online at a time that suits them.

Initial data processing and exploration was done in Excel before being imported into a statistics tool where Tukey's (1977) exploratory data analysis was used as a guide to graphically represent and understand the data in the context of the study objective. The individual variables were then analysed and compared against one another, specifically considering highs and lows, distribution and proportion as per Sparrow's (1989) guidelines before final hypothesis analysis was completed.

Microsoft Excel produced a set of easy-to-understand tables and graphs on the respondents' demographic profiles after initial data clean-up and formatting was completed. The spreadsheet was then imported into Dell Statistica, where a range of data analysis activities were performed. Initial data analysis focused on descriptive statistics, looking to confirm that the data fell within the available range of each question. In addition to calculating mean and standard deviation data sets for each question, a box and whisker plot was created to give a pictorial representation of the data, with the specific intention of checking the highs and lows of each question to ensure they fell within the available range (Saunders, Lewis & Thornhill 2009).

Once the data integrity had been validated with the box and whisker plot graph, further statistical analysis was performed to test for reliability. Reliability is a measurement of internal consistency (Trivedi & Kumar 2014). Cronbach's alpha test was deployed to calculate the internal consistency of the questionnaire's main constructs. Cronbach's alpha test is frequently seen deployed in the literature to evaluate the internal consistency of research instruments. The Cronbach's alpha test outputs a value of internal consistency for each construct, with a threshold level of 0.7 or greater used to determine whether that particular construct has good internal consistency. In this study, except for content delivery, which showed a questionable internal consistency at 0.623 (see Table 2), all other constructs were greater than 0.7, confirming that the items measured within each of those questions were reliable.

TABLE 2: Cronbach's alpha test.

Construct	Number of items (questions)	Mean	Standard deviation	Cronbach's alpha
Content delivery	5	20.09	2.96	0.623
Transactions	4	9.86	4.01	0.765
Location-based services	4	14.38	5.21	0.879
Entertainment	3	8.39	3.26	0.734
Perceived ease of use	4	16.25	2.45	0.919
Perceived usefulness	6	20.09	3.93	0.789
Perceived enjoyment	4	14.32	3.02	0.926

Subsequent data analysis produced a correlation coefficient, which sought to assess the strength of the relationship between the questionnaire's main constructs. A regression analysis was also performed on each of the study's hypotheses to calculate the probability of the results having occurred by chance.

Findings

Respondent profiles

In total, 88 responses were collected. Seven of these were incomplete and removed from the sample data, leaving 81 responses for statistical analysis. The respondents showed a higher proportion of females at 63%, a bias towards younger participants with 91% reporting to either be in their 20s or 30s and a highly educated base with 75% reporting to have an undergraduate degree or higher. No responses were captured from those younger than 20, and a limited number of responses were received from those over 40. The profiles captured might not be representative of the m-commerce user base in South Africa and could be a limiting factor in the reach that this study's findings will have. This has been called out in the limitations section of this paper with some recommendations for possible future studies.

Correlation matrix

A correlation analysis was conducted as shown in Table 3 (significant correlations of $p < 0.05$). The findings show a negative correlation between age and m-commerce usage activities in terms of content delivery ($r = -0.132$), transactions ($r = -0.239$), location-based services ($r = -0.192$) and entertainment ($r = -0.113$). These findings suggest that the younger participants in the study are more likely to engage in using m-commerce activities than older participants. Education produced mostly positive (albeit very weak) correlations to m-commerce usage activities, suggesting that better educated respondents are more likely to engage with m-commerce for content delivery ($r = 0.124$), transactions ($r = 0.244$), location-based services ($r = 0.269$) and entertainment ($r = 0.143$).

Gender indicated some very weak positive correlations to m-commerce usage in terms of content delivery ($r = 0.132$), transactions ($r = 0.088$) and location-based services ($r = 0.091$), whilst entertainment showed a negative correlation to gender

TABLE 3: Correlation analysis.

Variable	C	T	LBS	E	EOU	U	En	G	A	Edu
Content	1	-	-	-	-	-	-	-	-	-
Transaction	0.434	1	-	-	-	-	-	-	-	-
Location-based service	0.467	0.417	1	-	-	-	-	-	-	-
Entertainment	0.239	0.314	0.351	1	-	-	-	-	-	-
Ease of use	0.321	0.291	0.255	0.131	1	-	-	-	-	-
Usefulness	0.385	0.474	0.282	0.154	0.318	1	-	-	-	-
Enjoyment	0.49	0.332	0.335	0.114	0.341	0.651	1	-	-	-
Gender	0.132	0.088	0.091	-0.219	0.101	0.086	0.151	1	-	-
Age	-0.132	-0.239	-0.192	-0.113	-0.294	-0.011	0.148	-0.164	1	-
Education	0.124	0.244	0.269	0.143	0.12	0.088	-0.053	0.118	-0.195	1

C, content; T, transaction; LBS, location-based service; E, entertainment; EOU, ease of use; U, usefulness; En, enjoyment; G, gender; A, age; Edu, education.

TABLE 4: Regression analysis.

Hypothesis	Content	Transactions	Location	Entertainment
H1: Age	$p = 0.241$ $r = 0.131$	$p = 0.031$ $r = 0.238$	$p = 0.085$ $r = 0.192$	$p = 0.313$ $r = 0.113$
H2: Education	$p = 0.270$ $r = 0.123$	$p = 0.028$ $r = 0.243$	$p = 0.015$ $r = 0.269$	$p = 0.201$ $r = 0.143$
H3: Gender	$p = 0.240$ $r = 0.131$	$p = 0.435$ $r = 0.087$	$p = 0.420$ $r = 0.090$	$p = 0.049$ $r = 0.218$
H4: Perceived enjoyment	$p = 0.000$ $r = 0.489$	$p = 0.002$ $r = 0.331$	$p = 0.002$ $r = 0.335$	$p = 0.310$ $r = 0.114$
H5: Perceived ease of use	$p = 0.003$ $r = 0.320$	$p = 0.008$ $r = 0.291$	$p = 0.020$ $r = 0.255$	$p = 0.244$ $r = 0.130$
H6: Perceived usefulness	$p = 0.000$ $r = 0.384$	$p = 0.000$ $r = 0.474$	$p = 0.010$ $r = 0.282$	$p = 0.169$ $r = 0.154$

H, Hypothesis

($r = -0.219$). Males in this study showed more of an inclination to use m-commerce for entertainment purposes than females, particularly for streaming music. All of the motivational factors (perceived usefulness, perceived ease of use and perceived enjoyment) showed a positive correlation to the different m-commerce usage activities (content delivery, transaction, location-based services and entertainment). This shows that motivation factors play an important role in the respondents engaging in m-commerce.

Regression analysis

Regression analysis was deployed during hypothesis testing (as shown in Table 4). The tests were carried out with the aim of exploring if the relationships identified from data analysis were significant. A relationship is deemed significant when $p < 0.05$ (Saunders et al. 2009). Each of the six hypotheses was evaluated against the four constructs of m-commerce usage, namely content delivery, transactions, location-based services and entertainment. The results show us that there is no significant relationship (i.e. $p < 0.05$) between age and m-commerce usage activities in terms of content delivery ($p = 0.241$), location-based services ($p = 0.085$) and entertainment ($p = 0.313$). There is a significant relationship between age and transactions ($p = 0.031$); however, the data show that age is positively related ($r = 0.238$) to m-commerce usage in terms of transactions.

There was no significant relationship (i.e. $p = 0.05$) between education level and content delivery and entertainment ($p = 0.201$). By contrast, the results show a positive and

significant relationship between education level and transactions and location-based services.

Apart from entertainment, no significant relationship was found between gender and content delivery ($p = 0.240$), transactions ($p = 0.435$), and location-based services. However, gender showed a significant and positive relationship towards entertainment. Perceived enjoyment has significant and positive relationships to m-commerce usage in terms of content delivery, transactions and location-based services. The results show no significant relationship between enjoyment and entertainment. The results showed a significant and positive relationship between perceived ease of use and content delivery, transactions, and location-based services. No significant relationship was found between perceived ease of use and entertainment. Perceived usefulness showed significant and positive relationships with content delivery, transactions and location-based services, but the results were not significant for entertainment where $p = 0.169$.

Discussion

The findings of this study show that there is no significant relationship between age and m-commerce usage activities in terms of content delivery, location-based services and entertainment. This is because young, affluent and single individuals (especially women) tend to be the most positive towards m-commerce adoption (Okazaki 2006). However, our findings suggest that older m-commerce users conduct more transaction-based activities than their younger counterparts. This is not surprising because according to Sorce, Perotti and Widrick (2005) older consumers were more likely to purchase items online once they had searched for the item. Findings also show that m-commerce users, regardless of their education level, engage in content delivery such as news and email as well as entertainment such as online gaming and streaming music and videos online through their mobile devices. A positive and significant relationship between education level and transactions and location-based services was evident in this study, despite this being contrary to Okazaki (2006), who found that well-educated professionals, who are also more mature, tend to be the least positive about m-commerce. Our findings can be explained by linking education level to income and/or purchasing power, whereby those with a higher education could possibly

have a higher income and purchasing power and are therefore able to conduct more transactions than those with a lower education level. These findings and possible explanations are supported by Bornman (2012), who found that in Africa education and income are positively correlated, and those with a higher level of education will use the Internet more than those with a lower level of education. Similar results are reported by Akhter (2012), who found that income has a significant effect on online spending. More highly educated users might also be able to make better use of, and act on, location-based services such as time-sensitive offers and notifications, leading them to use these services more. The findings, therefore, suggest that most of the m-commerce activities were perceived in the same manner by all age groups, but this perception differed when it came to making transactions that involved substantial monetary exchange.

With the exception of entertainment, no significant relationship was found between gender and content delivery, transactions and location-based services. These results deviate from the popular view in literature that males tend to be more engaged with technology services than females because females prefer the interpersonal communication style gained from going to physical shops, whereas males prefer the utility of online shopping and its related activities. The results, however, confirm those of Chong (2013a). Our findings, contrarily, show a significant and positive relationship between gender and entertainment, with males engaging more in m-commerce entertainment activities such as listening to music and playing games online through their mobile devices. These findings confirm previous studies such as those of Ko et al. (2005), who found that subjects who had previously played online games were predominantly male, although this trend could change in the future given that 'female participation in games continues to grow, and recent statistics indicate that women were 46% of the most frequent purchasers of video games in 2013' (Veltri et al. 2014:9). Nevertheless, gaming remains the most popular form of entertainment among males and Ko et al. (2005) go to caution us against this trend because 'older age, lower self-esteem, and lower satisfaction with daily life were associated with more severe addiction among males, but not among females'.

Our findings showed a significant relationship between the motivational variables of perceived enjoyment, perceived ease of use and perceived usefulness, and m-commerce usage activities of content delivery, transactions, and location-based services. Whilst it may seem trivial to explain that users will engage more with m-commerce activities if they find them easy to use, enjoyable or useful, none of these characteristics have a significant relationship with m-commerce entertainment activities. These findings suggest that users will engage in online entertainment activities regardless of the activity's ease of use, usefulness to them or its enjoyment value, which could possibly be an indication that the usage is driven by other motivating social influences such as social interaction and communication via the online gaming platform.

Conclusion

The purpose of this study was to examine the role of demographic and motivational factors on m-commerce usage activities. Following a positivist stance and an online survey as a data collection technique, the results show that age has no significant relationship with three of the m-commerce usage activities – content delivery, location-based services and entertainment – but is significantly related to m-commerce transactions. The implication is that the age of the users has an effect on their purchasing behaviour. This is contrary to Chong (2013a), who finds that younger users are more likely to use m-commerce for all activities when compared to older users. Our findings can be interpreted that older users are more likely to receive an income, which can influence their transactional decisions, and in Africa in particular income has been found to be the main explanatory variable for usage (Chabossou et al. 2008).

The results also show that one's education status influences the following m-commerce usage activities: transactions and location-based services. One's gender influences how one uses m-commerce, with males being the majority users of entertainment services of m-commerce. Finally, the results show a significant relationship between all three motivational variables (perceived enjoyment, perceived ease of use and perceived usefulness) and m-commerce usage activities of content delivery, transactions and location-based services but no significant relationship with m-commerce entertainment activities.

From a practitioner's point of view, the findings provide the financial services industry with a better understanding of the relationships between customer demographics and the m-commerce activities they engage in, to better customise their product offering. Although the study provides practical contribution and a better explanation of m-commerce activities in South Africa, we are cognisant of several limitations. Firstly, the sample size was small and may therefore not be representative of the entire South African population. Secondly, variables such as income and employment were not included in the research model, which in retrospect appear to be significant factors in interpreting the findings in the context of the study. These concerns will be addressed in the future work of this study.

Acknowledgements

Competing interests

The authors declare that they have no financial or personal relationships which may have inappropriately influenced them in writing this article.

Author's contributions

M.C. was responsible for conceptual design, data collection and analysis, whilst S.K.K. was responsible for theoretical contribution, presentation of the findings and discussion.

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