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MOBILE DEVICES AND MOBILE INTERNET DATA SERVICES: IMPLICATIONS FOR MOBILE BANKING

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Abstract: *Mobile devices allow users to access applications anytime and anywhere. Through mobile devices, users can download and get access to banking services, using mobile banking applications. In order to perform banking activities, users need to trust in this service first, and this includes the quality of the Internet connection. Moreover, considering that mobile devices have different screen sizes, these differences may also affect the intention to use mobile banking. Therefore, the aim of this paper was to analyze the potential effect of the size of mobile devices and of the mobile Internet data services on trust in mobile banking. The quantitative analysis includes descriptive statistics, confirmatory factor analysis and structural equation modeling. The main results suggest that mobile Internet data services presented a positive effect on trust in mobile banking, but the type of mobile device has no significant effect on trust. The discussion of the results considers the possibility of strategic alliances between different sectors to improve the adoption of mobile banking in developing countries.*

Keywords: *mobile devices, trust, wireless networks, mobile internet data service, Brazil.*

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INTRODUCTION

Over the past decades, computers have become smaller, more portable, and with user-friendly interfaces, allowing their constant presence in the life of people. An example of this evolution is the case of mobile devices, which allow their users to access networks anytime and anywhere (Yang et al., 2012). The proliferation of mobile devices is increasing at an incredible rate (Kortum & Sorber, 2015). This type of human-computer interaction facilitates personal and social life of people (Lee, 2009). In addition, new mobile technologies are available specifically for the development of financial services (Boonsiritomachai & Pitchayadejanant, 2019).

One application that uses the ubiquitous characteristics of mobile devices is mobile banking. With mobile banking, customers can perform banking tasks such as bill payments and money transferences, with the values of immediate accessibility and convenience (Cruz et al., 2010; Oliveira et al., 2014; Hanif & Lallie, 2021; Karjaluoto et al., 2021; Apau et al., 2025) and a potential to revolutionize the interaction with consumers (Ali et al., 2023). Both banks and customers benefit from this technology in many ways (Apau et al., 2025; Palamidovska-Sterjadovska et al., 2025), and many users access mobile banking services several times a day (Luo et al., 2025). It is also important to note that the needs of people with disabilities should also be considered when offering banking services through mobile devices (Borowska-Beszta et al., 2025).

The number of cell-phones is higher than the number of computers, therefore, the use mobile banking has become more popular than the use of e-banking (Mehrad & Mohammadi, 2017). Flexibility is another feature that makes mobile banking more attractive than e-banking (Palamidovska-Sterjadovska et al., 2025). The recent health crisis caused by COVID-19 encouraged the practice of contactless transactions (Kim & Ryu, 2025), which also contributed to the demand and interest in using mobile banking services (Zakariah & Shariff, 2025). Despite the benefits of mobile banking, its adoption for conducting banking transactions is not as widespread as expected (Cruz et al., 2010; Shaikh & Karjaluoto, 2015; Rababa et al., 2025; Zakariah & Shariff, 2025). Thus, a better understanding about factors that facilitate (or hinder) the adoption of this technology is important for banks, to telecommunication companies, to mobile banking developers, and to end users.

Users can access the applications in mobile devices through open wireless networks, private wireless networks, or still through mobile Internet data services. The concern about security of personal information and privacy (Liao et al., 2011; Montezemi & Saremi, 2014) could be mitigated when customers contract mobile data services, because they will not depend of other networks to use mobile applications. Together with this consideration is the fact that mobile devices are small, but this characteristic also includes small display sizes. The small size of mobile devices may decrease the intention of users to use them to perform mobile banking transactions, especially considering the risk involved. Mobile banking platforms have attracted the attention of hackers (Apau et al., 2025), a factor that may influence bank customers' risk perceptions. On the other hand, users may perceive phones as more familiar in comparison with tablets, and this familiarity can be converted in higher perception of usability (Kortum & Sorber, 2015). Due to compatibility, "smartphones can benefit users in many ways, such as business and personal communication, information on the health issues identified earlier and mobile banking" (Choudrie et al., 2018, p. 453).

Based on this reasoning, we find a motivation to develop this paper and contribute to the literature of IS by including a quantitative analysis of variables that may improve the interaction between users and mobile devices. Therefore, **the aim of this study is to analyze the potential effect of the size of mobile devices and of the mobile Internet data services on trust in mobile banking**. A recent literature review on mobile banking showed that no study has explicitly investigated the effect of smartphones or tablets use on mobile banking adoption (Shaikh & Karjaluoto, 2015), which indicates the relevance of developing such analysis in this paper. Moreover, based on a set of previous research, Chaouali et al. (2017) state that poor telecommunication infrastructure, poor internet coverage and the cost of Internet are variables that can affect the adoption of mobile banking. The advancement of mobile and telecommunication technology benefits the acceleration of mobile banking (Alalwan et al., 2017; Afshan & Sharif, 2016).

Traditional theories such as TAM (Davis, 1989), UTAUT (Venkatesh et al., 2003), TTF (Goodhue, 1995; Goodhue & Thompson, 1995), and IDT (Rogers, 1995) have been employed to explain mobile banking adoption (Zhou et al., 2010; Oliveira et al., 2014; Shaikh & Karjaluoto, 2015; Mehrad & Mohammadi, 2017). There is some agreement that security and trust are the most important factors affecting mobile banking adoption, as this technology involves monetary transactions. Therefore, it is fundamental for mobile banking providers to build users' initial trust (Zhou, 2012a), and maintain it over time. Moreover, according to Alalwan et al. (2017, p. 106), trust is important to motivating customers to use mobile banking and also in "shaping their perception toward such technology as more productive and novel technology". Trust is the dependent variable of this research.

We collected data from Brazilian respondents to test the hypotheses of the quantitative model. Brazil is a developing country in which the adoption of mobile banking is still low (Febraban, 2015). Cruz et al. (2010) found that perceived risk is one of the main barriers to improve mobile banking adoption in Brazil, which reinforces the relevance of the analysis of trust as a dependent variable. A common goal of policymakers is to increase bank account ownership (Riley et al., 2025). In regions where bank access is limited, mobile banking can bring benefits to citizens (Kouandou & Laajimi, 2025). Moreover, many adults in developing countries do not have access to bank accounts (Agurto et al., 2025), a factor that makes Brazil an interesting case to study the adoption of mobile banking.

Exploring the use of applications available in mobile devices contributes with their continuous improvement (Kortum & Sorber, 2015). It can benefit both customers and app developers, because it helps in identifying customer's preferences and attitudes toward contemporary mobile services (Lee, 2009). This paper explores a variable that may be useful for banks and telecommunications companies, since they can establish partnerships to expand both mobile banking adoption and mobile service usage. Mobile telecommunication service industry need to develop strategies to make their customers satisfied with mobile services, preventing loss and maintaining customer retention (Lee, 2009). These strategies also involve the risks (or security) perceived by users when they use Internet data services to perform personal activities in internet.

In developing countries, the cost of mobile Internet data services may represent a more significant amount of resources relative to an individual's income. Moreover, in most of previous research on mobile banking, the attention is dedicated to the context of developed economies (Kamboj, Sharma & Sarmah, 2022), a factor that highlights the relevance of new

research based on data from developing countries. Therefore, a study of the potential impact of the type of Internet connection can present on banking technologies can contribute to a better understanding of the factors that influence, even indirectly, the adoption of mobile banking in emerging economies.

HYPOTHESES DEVELOPMENT

In mobile technology, the quality of service perceived by users is an important concept (Lee, 2009), as well as the effective network performance (wired or wireless) (Saliba et al., 2005; Lee, 2009). Wireless data can be said as relevant issue to telecommunications companies (Saliba et al., 2005), especially when we observe the popularity of mobile internet (Yang et al., 2012). Even with the different applications that are available in mobile devices, users generally concentrate their attention on a few services of mobile internet (Lee et al., 2005).

Companies in dynamic industries such as computers, software and telecommunications have been increasingly using different kinds of cooperative relationships (Hoffmann, 2007; Lavie, 2007). Studying extreme mobile experiences, Salo (2014) found that utility is a dominant category of positive experiences with mobile applications. As mobile banking seems to be one kind of utilitarian application (O'Brien, 2010; Li et al., 2012), strategic alliances to improve the rate of mobile banking adoption could result in more people using telecommunication services.

Strategic alliances represent voluntary agreements between enterprises that can involve exchange and co-development of products, technologies and services (Gulati, 1998; 1999). New technologies can represent a stimulus to cooperative efforts, even between groups of competitors (Powel et al., 1996). These alliances can take a variety of forms and occur as a result of different reasons and goals, and an important issue for alliances is their effect on performance (both the performance of the alliance itself and the performance of firms involved) (Gulati, 1998; Lavie, 2007). In this sense, these partnerships can also be benefit for mobile banking adoption in developing countries.

There is a growing concern about how individuals can protect their personal information (Liao et al., 2011), so security and privacy of online transactions are essential for customers to trust in online banking (Montezemi & Saremi, 2014). Privacy concerns have a negative effect on electronic commerce adoption (Liao et al., 2011), and their effect on mobile banking adoption should be similar.

Users that have access to mobile Internet data services experience a different environment to develop their virtual activities, once they are presumed to have higher levels of trust in the internet connection. When compared to wired network, mobile internet networks may be more vulnerable to information interception (Zhou, 2012b). In this way, users that use their mobile applications only with open networks may present higher concerns about trust in their connection with the internet. We hypothesized that this security perception on the internet connection will be transferred to trust in mobile banking, so we have the first hypothesis of this study: **H_1** - the use of mobile Internet data services has a positive effect on trust in mobile banking.

The use of mobile devices in education, also known as m-learning, has some advantages such as portability and wireless connection; nevertheless, different screen sizes represent a

kind of disadvantage of mobile devices for learning (Furió et al. 2013). Despite it was expected that larger screen size would present a significant effect on variables such as satisfaction and interaction of users, Furió et al. (2013, p. 38) observed that both devices (iPhone and Tablet PC) "were equally suited for educational games". In a previous study about touchscreen keyboards, Sears et al. (1993) found that users' performance on smallest keyboards was lower than the performance of the largest ones; also, experience with small keyboards is an aspect to be considered. Considering that currently users are more familiar with small devices, perhaps some negative effects of small sizes decreased along time.

The perception of complexities and difficulties with novel technologies (such as mobile banking) can be reduced, preventing risk and promoting trust when compatibility issues are considered (Choudrie et al., 2018). Moreover, the attitudes and intentions toward mobile banking might differ considerably between smartphone and tablet users (Shaikh & Karjaluoto, 2015), since the applications available in these devices have different designs. Tablets are bigger than smartphones. Due to the size screen limitation, developers may need to choose carefully what contents and functions to display in smartphones apps (Kortum & Sorber, 2015), including the developers of mobile banking apps.

"Yet, graphic user interfaces (GUIs) often are not adapted to this; desktop computer GUIs are migrated to the smaller devices without consideration of their special requirements. This results in miniaturization of icons and buttons" (Conradi et al., 2015, p. 388). Furthermore, there is the case of virtual keyboards, especially because "touch screen interface has become prevalent on mobile devices" (Kim et al., 2014), and the size of keyboards can affect the performance of users (Sears et al. 1993).

Kortum and Sorber (2015) found that phone apps usability was being rated higher in comparison with the rates of tablet apps. McLellan et al. (2012) observed that users with more extensive experience with a technology tend to provide higher scores of usability for this technology. Following this reasoning, the results of Kortum and Sorber (2015) that phones were scored higher than tablets, can be explained by the experience and familiarity of the users with mobile phones. In this way, we stablish the second hypothesis of this study: **H_2** - the kind of mobile device has a significant effect on trust in mobile banking.

DATA AND METHOD

This paper has two goals: i) analyze the effect of mobile Internet data services, contracted from telecommunication companies, on trust in mobile banking; and ii) analyze if there are significant differences of trust in mobile banking among different kinds of mobile devices. We included three other characteristics in our model that may affect trust in mobile banking: task characteristics (Junglas et al., 2008; Zhou et al., 2010; Hwang & Jeong, 2016), age, and gender (Lee, 2009; Hwang, 2010).

The concept of task characteristics is relevant to understand mobile banking adoption (Zhou et al., 2010), since customers tend to adopt this technology in order to optimize their time spent with banking activities. Thus, it is natural to presume that customers with higher levels of banking activities will show higher levels of trust in mobile banking. Age and gender were included because younger customers tend to be more willing to adopt new technologies than their older counterparts (Cruz et al., 2010), and men tend to be less anxious

with technology than women (Laguna & Babcock, 1997). We expect that these effects will affect trust in mobile banking too. The two constructs that we used in our research model were measured as shown in Appendix A.

All these six questions were answered with a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The other variables of the model are age (in years); gender (male/female); if the respondent has mobile Internet data services in his/her mobile device (yes/no); and kind of mobile device that the respondent usually uses (smartphones / tablets). Data were collected through person-to-person questionnaires, with undergraduate students in the southeast region of Brazil. We obtained 1,083 valid questionnaires (which represents 92.01% of 1,173 questionnaires that we distributed).

To test the hypotheses, in a first moment we used confirmatory factor analysis (CFA), and then we applied structural equation modeling (SEM), as recommended by Anderson and Gerbing (1988). We also analyzed the descriptive statistics of variables, in order to explore more information about empirical data.

RESULTS

Descriptive Analysis

The first step of data analysis was the descriptive statistics. We observed that the respondents were 51.6% male (48.4% female) and ranged in age from 16 to 51 years old. The average of age was 21.72 years, indicating that the majority of respondents are young. This is a natural result, since we applied the questionnaires to undergraduate students. Almost three quarters of sample (73.41%) reported the use of mobile Internet data services, contracted from telecommunication companies.

The adoption of tablets among the students was relatively low (18.88%) in comparison with the adoption of smartphones (97.04%). These preliminary results indicate that the adoption of smartphones is widespread in the sample, and it is in accordance with the considerations made in the literature review (Kortum & Sorber, 2015), that smartphones tend to be more familiar than tablets among users. Additionally, due to compatibility (Choudrie et al., 2018), the higher rates of adoption of smartphones indicates a good panorama for an initial use of banking services through mobile devices.

These results are interesting, because the students in the sample have smartphones, and the majority have mobile Internet data services. Therefore, it is assumed that they have the minimum requirements to use mobile banking services, but the adoption of mobile banking in Brazil is still very low (Febraban, 2015). In this way, it is important to understand the variables related to trust in mobile banking, since trust is fundamental to the adoption of technologies that involve money transactions.

Table 1 shows the mean of each question used to measure latent variables. We can observe that students tend to trust in mobile banking more than distrust, because the average scores of questions tru1, tru2, and tru3 are all higher than 3. Results also indicate that the level of task activities in the sample tend to be high for questions tsk2 (manage account anytime anywhere) and tsk3 (acquire account information in real time). With these results,

we could deduce that the use of mobile banking for these students would be beneficial to save time and to optimize their activities.

Table 1: Descriptive statistics of the items used to measure latent variables

Items	n	Minimum	Maximum	Mean	Std. Deviation
tsk1	1,083	1.000	5.000	2.258	1.381
tsk2	1,083	1.000	5.000	3.025	1.601
tsk3	1,083	1.000	5.000	3.464	1.592
tru1	1,083	1.000	5.000	3.271	1.177
tru2	1,083	1.000	5.000	3.136	1.165
tru4	1,083	1.000	5.000	3.533	1.126

In general, the results of this descriptive analysis showed that it seems to exist a good potential for mobile banking penetration to respondents with similar characteristics in this region of Brazil. The main reasons for this affirmation are: i) respondents have the minimum skills and resources to use mobile banking; ii) respondents pointed out a frequency of tasks characteristics that could be optimized with the use of mobile banking.

CFA and SEM

The research model involves two latent variables: trust in mobile banking and task characteristics. We developed CFA in order to evaluate convergent and discriminant validity of these measures (trust and task). Table 2 shows the loadings of the questions in the factor analysis, and it can be observed that all questions were loaded according to their respective construct.

Table 2: Loadings of questions in the factor analysis

Items	Task	Trust
tsk1	**0.815**	0.145
tsk2	**0.907**	0.234
tsk3	**0.857**	0.214
tru1	0.267	**0.894**
tru2	0.210	**0.900**
tru4	0.107	**0.661**

Table 3 indicates the Cronbach's Alpha, Composite Reliability and the Extracted Variance of the constructs. The results indicated good indexes for internal consistency of measures, since all indexes registered values above those recommended by the literature. The root square of AVE is 0.835 (to task) and 0.750 (to trust). These values are above the

correlation between the constructs (0.492, $p<0.01$), which indicates good discriminant validity between these two latent variables.

Table 3: Reliability of the constructs

Const.	Items	Load. (Std.)	Average Variance Extracted (AVE)	Root Square of AVE	Composite Reliability	Cronbach's Alpha
TSK	tsk1	0.683	0.697	0.835	0.871	0.859
	tsk2	0.976				
	tsk3	0.820				
TRU	tru1	0.759	0.562	0.750	0.791	0.799
	tru2	0.857				
	tru3	0.613				
Recommended Values			0.500	0.707	0.700	0.700

In Table 4 we included the indexes for goodness of fit, for both CFA and SEM. The results of CFA includes data of the two latent variables (trust and task), and the results in the SEM column refer to the complete model, which also considers age, gender, mobile Internet data and kind of mobile device. There are evidences that the quantitative models are adequate for hypothesis testing. In the CFA stage, for only one index: RMSEA, the value was not below the threshold of 8%, but it is below 10% and the lower value of the confidence interval, with 90% of confidence, is lower than 8% (it is 7.6%, as we can see on Table 4). Furthermore, all the values of RMSEA were below 8% in the SEM analysis. In this way, we considered that these measures were adequate and we performed the hypotheses testing.

Table 4: Goodness of fit of the quantitative models

Items	CFA	SEM
chi-square	65.718	104.197
d.f.	6	22
signif.	0.000	0.000
GFI	0.981	0.981
AGFI	0.932	0.953
Standard. RMR	0.039	0.030
RMSEA	0.096	0.059
RMSEA (Low. 90%)	0.076	0.048
RMSEA (Up. 90%)	0.118	0.070
CFI	0.980	0.974
NFI	0.978	0.967
NNFI	0.951	0.946

Table 5 contains the sign of the coefficients in the path analysis (r-square of the model: 25.71%). The first hypothesis of this study (**H_1**) was that mobile Internet data services has a positive effect on trust in mobile banking. The results obtained through the questionnaires supported this hypothesis, indicating that students that already have mobile data services tend

to present higher levels of trust in mobile banking, in comparison with their counterparts that do not have mobile data services.

Table 5: Results for hypotheses testing

Hypothesis	Relationship	Coeff.	Coeff.
H1	Mobile Data	0.070 **	0.072 **
H2	Kind of Mob. Dev. (smartphone)	0.012 n.s.	
H2	Kind of Mob. Dev. (tablet)		-0.013 n.s.
control	Task Charact.	0.482 ***	0.483 ***
control	Age	-0.058 *	-0.058 *
control	Gender (male)	0.083 ***	0.082 ***

Notes: r-square for the model: 25.71% and 25.79%, respectively; Coeff.: path coefficients; ***: significant at 1%; **: significant at 5%; *: significant at 10%; n.s.: not significant.

This result indicates important information to mobile banking developers, banks and telecommunication companies. The existence of strategic alliances (Gulati, 1998; 1999; Hoffmann, 2007; Lavie, 2007) between these companies can contribute to a widely adoption of mobile banking in Brazil, because consumers can realize greater security to develop their banking transactions. Privacy / security concerns (Liao et al., 2011; Montezemi & Saremi, 2014) may be reduced when users contract mobile data services.

This result also reinforce the consideration made in previous research (such as Chaouali et al., 2017), that in developing countries the telecommunication infrastructure can affect the adoption of mobile banking. This also in line with studies (Afshan & Sharif, 2016; Alalwan et al., 2017) which link the advancements in mobile banking to the development of telecommunication technology in the country. In Brazil, the availability of a personal mobile Internet data services in the personal mobile device of the respondent of the sample seems to generate a positive effect on their trust in mobile banking. One alternative explanation could be that those users who are willing to use mobile banking at their mobile devices already have contracted internet channels that they perceive as safety. With this statistically significant effect, we can realize that the quality of Internet is a factor that may facilitate (or difficult) the adoption of contemporary technologies which requires personal data and financial information.

Age and gender have the expected effects. Even with a sample in which the majority of respondents are young, age had a negative effect on trust in mobile banking. Regarding to gender, men tended to trust more in this technology, when compared to their counterparts (women). This indicate that the strategies to introduce mobile banking should be different between users of different genders.

Shaikh and Karjaluoto (2015) pointed out the absence of studies about the effect of smartphone / tablet use on mobile banking adoption. Our quantitative analysis indicated that trust in mobile banking is not significantly different between these two kinds of mobile devices. In this way, **H_2** was not supported. Maybe the differences in the perception of quality of other mobile applications, that is due to the familiarity of users with phones (Kortum & Sorber, 2015), do not necessarily affect their perception about how mobile banking is secure and trustworthy. These results are not in different directions of those obtained by Kim et al.

(2014) and Furió et al. (2013), about a minimum (or not significant) effect of size on typing force, forearm muscle activity, engagement and/or user's satisfaction.

LIMITATIONS

This study has three major limitations. First, we assume (and argue) that mobile Internet data service is a predictor of trust in mobile banking. However, our results do not necessarily indicate a causal relationship from data service to trust. In this way, the observed positive relationship may be subject to endogeneity, and other variable(s) may simultaneously affect both trust and Internet data service. On the other hand, it is important to highlight that it is not common in Brazil for people to have free access to a secure wireless connection, which indicates the relevance of this result.

The second limitation is the use of dummy variables to measure the type of mobile device (smartphones / tablets), and the use of dummy variable to observe the adoption of mobile Internet data services. Further studies could explore other types of measures for these variables, especially for mobile Internet data services, which presented a significant effect on trust in mobile banking.

Another limitation relates to the characteristics of the sample. The majority of the study sample consisted of younger students. Despite the significant result that we observed in the path coefficients (for the variable age), we recommend new research with a more balanced composition between young and older people, in order to verify the robustness of the results that we obtained in this paper.

IMPLICATIONS AND FINAL REMARKS

In the context of mobile banking, this paper considered two variables that, to the best of our knowledge, have not been directly studied before: the use of mobile Internet data services, and the type of mobile device. We collected data from Brazilian undergraduate students, since Brazil is a country where the adoption rate of mobile banking is still low (Febraban, 2015).

The descriptive results, together with the hypotheses testing, showed a good potential for mobile banking adoption in Brazil. The popularity of mobile Internet (Yang et al., 2012) was also present in the sample, and this is a factor that may contribute to mobile banking adoption. Respondents reported higher levels of task activity related to banking services, and task activity was a significant variable in explaining trust in mobile banking. In this way, given the large market available for mobile services, banks could implement strategies to reach new customers, and these strategies must also take into account that men and women have different behaviors regarding trust in mobile banking.

Regarding the main results of the paper, despite our expectation of different levels of trust between smartphone users and tablet users (**H_2**), our analysis indicated that the type of mobile device does not seem to have a significant effect on trust in mobile banking. Thus, marketing efforts to reach new mobile banking users may have similar effects when combined with smartphone or tablet applications. This is an important finding from the

perspective of mobile banking developers. Perhaps users (and potential users) are not concerned with usability features (keyboard size, screen size, among others) to start using mobile banking. This finding also suggests some areas for future research, addressing, for example, the interaction between mobile device type and security features or users' previous experience with mobile banking.

Furthermore, and also based on the main results of this paper (**H_1**), we argue that banks, mobile banking developers and telecommunication companies should explore the possibility of strategic alliances in Brazil, especially when we observe that the penetration of mobile devices is increasing over time (Kortum & Sorber, 2015). Cooperative relationships are common in dynamic industries (Hoffmann, 2007; Lavie, 2007), especially in the case of new technologies (Powel et al., 1996), such as mobile banking.

These alliances could expand the adoption of mobile banking technology and provide new ways for banks' customers to access banking services. With this argument, this research extends the current literature on mobile banking, because we explore a variable (mobile data service) that indicates potential results of partnerships between different sectors to promote mobile banking adoption. Further research can also test the effect of this variable (use of mobile Internet data services) on other factors related to mobile banking use, such as security features and user experience.

Mobile devices represent a technology that allows users to access applications anytime and anywhere. Mobile banking is one of these applications, and the knowledge of the factors associated with its adoption can provide a special contribution to human-computer interaction. Based on the empirical findings of this research, there is a potential to improve this interaction through strategic alliances between telecommunications companies, banks and mobile banking developers.

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Appendix

Trust in mobile banking
I believe that mobile banking...
tru1 ... is trustworthy
tru2 ... keeps its promises
tru3 ... keeps users' interests in mind
(adopted from Kim et al., 2008; Zhou, 2011; Zhou, 2012a, 2012b; Oliveira et al., 2014)

Task Characteristics
I need to...
tsk1 ... transfer money anytime anywhere
tsk2 ... manage my account anytime anywhere
tsk3 ... acquire account information in real time
(adopted from Zhou et al., 2010; Oliveira et al., 2014)