A Structural Equations Model on Mobile Banking Factors Influencing Socio-economic Development in Bangladesh

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Abstract: Mobile banking has now become the most effective tool of financial inclusion worldwide as it offers a significant impact over the social and economic development of its users. Within a very short span of time, mobile banking depicted a tremendous growth in Bangladesh. This innovative payment mechanism has been adopted by users from every walk of life. This study analyzes the impact of some selected qualitative variables i.e. knowledge, usage and experience relating to mobile banking, on the customers' socio-economic development. The mediating effects of ICT literacy and attitude towards technology adoption were also analyzed. The data were collected through self-reported questionnaires from 357 sample respondents. The study findings conclude that almost all of the specified qualitative variables of mobile banking have direct effects on a customer's socio-economic development and mediating variables have some effects on such direct relationships.

Keywords: Mobile banking, behavioral aspects, social development, economic development, knowledge of mobile banking, usage of mobile banking, experience of mobile banking, ICT literacy, attitude towards technology adoption

1. Introduction

The mobile banking services offered by the commercial banks in Bangladesh are still in growth phase with a bright potential as a banking product. According to Asian Development Bank's (ADB) basic statistics (2015) report, Bangladesh is a country of 155.80 million people of which only 13% (Nicoletti, 2014) has bank accounts for transacting through formal financial channels. However, about 74.43% of the population has access to mobile phone, even though 31.5% of the total population live below the poverty line (ADB, 2015). Thus, there lies a huge opportunity to uplift the social as well as economic status of Bangladeshi population by offering banking services through mobile devices. With greater and convenient access to financial channels through mobile banking, people can be economically well-off with the less costly, legal and a faster payment mechanism. Banks are typically reluctant to open branches in remote and less profitable areas, where customer base and transaction volume are comparatively lower. Thus, a larger share of the population remains beyond the umbrella of banking services. Even if this portion of population wants to be included in the banking system, they do not get convenient reach and/or tailored products for their financial needs. However, the unbanked rural people, living in the remote areas, can be easily attended with banking reach and custom-made financial services, based on area/need, though using mobile banking facility. Alongside economic benefits, these parts of the population can be accustomed to savings, money transfers and other banking services. Such

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savings can shield themselves in distressed situation, meet basic needs and build support for expense shocks. Dealing financial services directly from handheld devices erases out the harmful practices of illegal moneylender or intermediaries in rural areas. In this way, mobile banking has greater prospects in enhancing the social status of rural people.

Mobile industry has also been contributed highly in the Gross Domestic Product (GDP) of the Asian countries. The study of GSMA (2015) reveals that this sector has contributed a sum of US$ 1.1 trillion to the GDP of Asia Pacific nations in 2014, which comprised 4.7% of the total GDP. Such a contribution is projected to be increased to US$ 1.8 trillion (5.9% of GDP) by 2020 (GSMA, 2015). Moreover, the contribution of mobile ecosystem to public funding was US$130 billion in 2014 and forecasted to reach US$ 150 billion by 2020. This mobile ecosystem supports near about 6.5 million jobs (up to 2014) and will continue to support approximately 8 million jobs by 2020 (GSMA, 2015). Furthermore, such mobile ecosystem will support additional 7 million indirect jobs by the year 2020 (GSMA, 2015). A number of factors played vital role to consider mobile phone as a facilitator of socio-economic development of a country. As per Donner (2006), mobile phones offer specialized facilities beyond the basic communication means and provide more security and mobility to users. In addition, by using the radio waves, mobile phone offers some unique technical benefits as the owner does not need to depend on the physical set-up, for example the wiring, stations, electricity supply etc. (The Economist, 2008). These were essential prerequisites for the landline to work but mobile phones leapfrogged such requirements. Moreover, a person with only basic understanding of technology and knowledge of numbers and symbols can operate mobile phones much easily (Rashid and Elder, 2009). With such a small know-how, mobile phones can cover the larger portion of population. Some other noteworthy technical leads that triggered mobile phone's contribution to development are its provisions for data transfer, internet browsing, means of connectivity with other devices, audio-visual media facilities etc. (Rashid and Elder, 2009). These stated services can play a much influential role in key socio-economic sectors namely education, governance, business, policy making, health etc. which are the basic pillars of development in a country.

The main objective of this study was to analyze the impact of mobile banking in developing both social and economic conditions of its users. The model identified social development and economic development of mobile banking users as the independent variables. The questionnaire, survey results and analysis, study findings and discussion of this study target directly to gain useful knowledge about the impact of some selected qualitative variables of mobile banking on socio-economic development. Sample data of this study were collected from Bangladesh and variables in the model were studied from the context of Bangladesh. Sample data contain 357 respondents from diverse demography and locations.

Socio-economic development of an individual depends on both qualitative and quantitative factors. Besides quantitative matters, the impacts of qualitative factors are often much higher in determining the level of development. Though mobile banking is a financial product, some

qualitative factors relating to its adoption and usage play a great role in expediting its socio-economic impact. The core problem of this study was to analyze the impact of some qualitative factors related with mobile banking over the socio-economic development of users. That is why the social development and economic development were set as the dependent variables of the study. The composite value of these two dependent variables were measured by considering some significant aspects that constitute the users' social and economic development. Therefore, the dependent variables offer sufficient validity to address the core problem of this study. Moreover, the study's main objectives were to present the concurrent scenario of mobile banking in Bangladesh and its socio-economic impact over the Bangladeshi mobile banking users. Consequently, collecting and analyzing sample data from the context of Bangladesh carries adequate justifications for addressing the study's problem.

Literature over mobile banking has always been weighted much on the adoption of it as a new technology. However, studies concerning the impact of such mobile financial services in either social or economic sense are sporadic and even if some researchers are found, they particularly highlight the quantitative aspects much. The impact assessment of user's knowledge, usage and experience relating to mobile banking are quite infrequent. Moreover, the mediation effects of information and communication technology (ICT) and attitude towards technology adoption are rarely addressed in case of mobile banking studies. This study attempted to bridge the research gap in existing literature relating to analyzing the impact of some selected qualitative aspects of mobile banking. Apart from this, the Bangladeshi mobile banking users' context was intermittently highlighted to have an impact analysis from the angle of this study's considered variables. So, from both the literature related and contextual gap, this study's primary contribution accounts for addressing the socio-economic impact of some selected qualitative factors of mobile banking over its users in Bangladesh.

This paper is arranged into several segments that starts with a literature review, which presents the current mobile banking scenario of Bangladesh. It also offers a picture of researches previously done over mobile banking on diverse contexts and model constructs. A detailed explanation of the conceptual model used in this study is presented in the background section. This section also contains the hypotheses, particularly adopted for this study. The methodologies regarding sampling procedure, measurement and tools of analysis were highlighted in the method segment. The following section offers a detailed analysis of survey results with different statistical tools. The discussion section presents the study findings and managerial implications for improving the practical business scenario of mobile banking. The discussion part also contains gained insights with their limitations and suggests future developments of this study. The conclusion summarizes the study's core findings, especially the primary contribution and recommended actions for development of mobile banking scenario in Bangladesh.

2. Literature Review

2.1 Definition of Mobile Banking

Mobile banking is a mechanism that coordinates mobile devices, mobile network operators and commercial banking channel to enable bank's customers for accomplishing a set of financial activities. However, the major weight is placed on data transmission through SMS and internet service while finalizing transactions. Now a day, the strictest kind of mobile banking excludes the use of dial-up phone calls or automated voice response (Corbitt and Barnes, 2003).

According to GSMA (2015), the number of unique subscribers in Asia Pacific region is 1.8 billion with a 45% penetration rate. This surge of subscribers is expected to increase in coming days and will reach an amount of about 2.4 billion subscribers by 2020, while the market penetration rate would be at 57% (GSMA, 2015). GSMA (2015) also reported that the number of SIM connection is 3.6 billion (91% penetration rate) which is projected to be in the 4.7 billion mark (112% penetration rate) in 2020. In addition to such high amount of subscribers and SIM connections, the internet usage and smartphone adoption rate are also expected to rise. Mobile broadband connections will increase from 37% (in 2014) to 69% (in 2020), while growing the data traffic to almost ten times of the current volume (GSMA, 2015). The number of smartphone users will grow from 1.3 billion in 2014 to approximately 3 billion in 2020, a rise of 1.7 billion adopters (GSMA, 2015). In Bangladesh, there were 120.8 million active mobile phone connections, up to fourth quarter of 2014, with a 5.7% growth rate. The SIM penetration was also quite high at 76% level, growing at a rate of 4.44% (GSMA, 2015).

2.2 Evolution of Mobile Banking

One of the core reasons behind the massive adoption of mobile technology in developing economies is the provision of financial services through mobile phones. The idea incorporates some essential financial services such as transferring money, paying utility bills, paying salary to workers and staffs, purchasing products and services etc. that will be processed from mobile devices without being physically present in bank's branch (GSMA, 2010). The rate of financial inclusion of remote and poorer folks of a country is much enhanced with these mobile financial services. In underdeveloped and developing parts of world, there are areas or people who are unbanked and do not use any formal channel for financial services (Ngugi, Pelowski and Ogembo, 2010). Mobile banking is offering a greater convenience to such areas and people to be in the banking channel for financial purposes.

The first of such mobile financial services was inaugurated in Kenya with the prominent mobile network operator Safaricom Company Ltd in 2007. Safaricom Company limited first started "M-PESA", meaning Mobile (M) Cash Money (PESA) that offered users to transfer money through mobile phones using their network. Such sort of mobile service was first used in Kenya where Safaricom and Vodafone (Pty) jointly offered the service. Safaricom enabled both the postpaid and prepaid subscribers to accomplish several financial services through M-PESA. The offered

services include cash transfer, airtime credit purchase, goods and service purchase and payment of salaries, wages and bills (Safaricom, 2009a). M-PESA brought a revolutionary change to the Safaricom Company as within only two years of starting M-PESA service, the customer base, availing mobile banking service, reached to an overwhelming 8.6 million in number. The per month transaction volume crossed the US$328 million mark alongside the excellent subscriber growth (Safaricom, 2009b). According to The Economist (2008), Kenya was by far the most successful instance of mobile money banking in Africa.

2.3 Current Status of Mobile Banking in Bangladesh

According to Bangladesh Bank (2015), 28 banks got the permission to offer the services of mobile banking in Bangladesh, among which 20 banks have already started the operation of mobile financial services. With 28.65 million registered customers and 538,170 agents of mobile banking, Bangladesh is now experiencing transactions of about BDT 85 billion per month via the mobile banking channel (Bangladesh Bank, 2015). As of June 2015, the number of active mobile banking accounts was 12.23 million and around 96.16 million transactions were accomplished (Bangladesh Bank, 2015). Transactions totaling BDT 129.7 billion, were completed through mobile banking in June 2015, where the number of daily transactions was 3.2 million and volume was BDT 4.32 billion on an average (Bangladesh Bank, 2015).

Figure 01: Volume of Mobile Financial Services by Category
(Amount in crore BDT in June 2015)
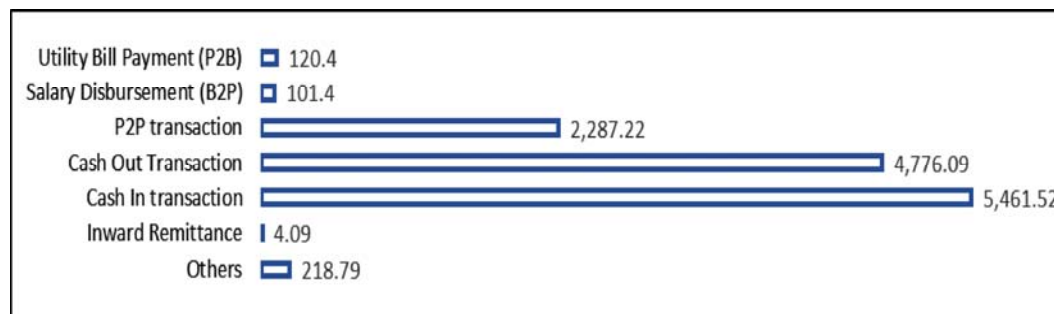
Source: Bangladesh Bank, 2015

The above graph summarizes the volume of mobile banking transactions with their respective service category. Cash-out and cash-in services are mostly used in Bangladesh for transaction purposes. However, the person-to-person (P2P) transaction volume is also significant and stands in the third position of mobile banking service ranking. As in June 2015, the topmost transaction volume was associated with cash-in transaction amounting to BDT 5,461.52 crore. In the chart, the second highest used transactions were conducted for cash-out purpose that amounted BDT 4,776.09 crore in June 2015. The P2P transactions totaled BDT 2,287.22 crore. Though not very significant as like the cash-out, cash-in and P2P transactions, a number of users have availed the utility bill payment and salary disbursement services of mobile banking. However, inward

remittance service of mobile banking is yet to be popular in mobile banking users as the transaction volume was not strong enough comparative to other services.

Table 01: Present Scenario of Mobile Banking by Top Service Providers

Bank's Name	*All the figures are in approximate BDT amounts					
	Title of Service	No. of Clients	No. of Agents	No. of Transactions in August, 2015	Transaction Volume in August, 2015	Market Share
BRAC Bank Limited	bKash	1.90 Cr	99000	9 Cr	10370 Cr	80-85 %
Dutch-Bangla Bank Limited	Mobile Banking	52 Lacs	123000	98 Lacs	2272 Cr	10%
Mercantile Bank	MYCash	9 Lacs	92000	72000	20 Cr	1%
United Commercial Bank	UCash	15 Lacs	40000	1 Lacs	21 Cr	1%
Islami Bank Bangladesh Limited	mCash	4 Lacs	26000	3 Lacs	14 Cr	1%

Source: Author's own calculation

The above table clarifies the concurrent status of mobile banking business in Bangladesh. From this table, it is obvious that "bKash", mobile banking service of BRAC bank limited, leads the market with overwhelming distinction from other market participants. With a significant transaction volume (BDT 10370 crore) and a giant client base, bKash of BRAC bank captured about 80-85% of the mobile banking market in Bangladesh. Dutch-Bangla Bank Limited holds the second position in such competitive market with approximately 10% market share.

With financial support from Bill and Melinda Gates Foundation, Micro Save, an international financial inclusion-consulting firm, conducted a study named as "Agent Network Accelerator Survey". In this study, Micro Save found that bKash, the joint venture product of Money in Motion of US and BRAC Bank of Bangladesh, holds the 50 percent of total market share in terms of agent network (Mehrotra et al., 2014). Mehrotra et al., (2014) also reported that Dutch-Bangla Bank Limited, being the pioneer in mobile banking services in Bangladesh, ranked second and United Commercial Bank's "UCash" was in third position based on agents, with 28 percent and 14 percent of market share respectively. According to the report of Mehrotra et al., (2014), with only after three years of launching, bKash has placed itself as the second largest provider of mobile money services in world based on individual accounts.

2.4 Typical Business Model of Mobile Banking in Bangladesh

For providing services to the unbanked people of Bangladesh, the commercial banks, offering mobile banking services, follow almost the similar procedure. Banks tag their own branches to

facilitate the mobile financial service (MFS) distributors. Every distributor has a current account in his/her convenient branch of the concerned bank. Distributors also need to maintain a mobile wallet account, attached to his/her mobile number. When a distributor deposits cash money to the branch, the bank sells an equivalent amount of virtual money, commonly known as "points", by fund management process to the distributor's wallet. After that, distributor dispenses this virtual money or points to his appointed direct sales executives' (DSE) mobile wallet via fund management tools. The DSE's are assigned with different areas to cover where the agents are located. The DSEs visit the agents on a daily basis and gather information about their need of virtual money or points. DSEs use fund management options to transfer the virtual money to agent's wallet as per their demand and receive equivalent amount of cash money from them.

Figure 02: The Typical Business Model of Mobile Banking in Bangladesh

Source: Author's own construct

All the mobile banking services offered by Bangladeshi commercial banks are mostly similar. The commonly found services are namely cash-in, cash-out, fund transfer, mobile top-up or recharge, balance query, statement query etc. Some of the banks also provide salary disbursement, bank deposit, and utility bill payment services to facilitate the customers. When a customer visits an agent point to cash-in some amount to his mobile wallet, he/she deposits cash money to the agent and the agent choose the cash-in options from his wallet to transfer the same amount of virtual money/points to the customer's wallet.

2.5 Typical Cost Structure of Mobile Banking in Bangladesh

The cost structure of mobile banking is also more or less the same for every banks. Most of the banks provide the cash-in facilities to the customer for free. In that case, the bank subsidized the commission amount for cash-in to the agent from its own account. However, when the customer uses the cash-out feature from agent point, he/she has to pay BDT 18.5 per thousands of transacted amounts. The calculation process of the charges is same for both cash-in and cash-out. At first, 10% Advance Income Tax (AIT) and 15% Value Added Tax (VAT) imposed by Bangladesh Govt. are deducted from the charged amount of 18.5 taka (per thousand). From the remainder amount, agent receives 62%, distributor receives 26%, mobile operator receives 7% and finally, the bank receives rest of the 5% as service fee. Hence, the revenue that the banks receive by providing the mobile banking services is comparatively lower than the revenue of other core banking services they offer. In addition, banks also bear the costs of two SMSs, charged by mobile operators, for notifying and confirming the service to customers. Thus, banks are sacrificing their profit for promoting inclusive financial services to the unbanked population in Bangladesh.

For low operation costs, about 96 percent mobile banking agents is earning profit. Though M-PESA of Kenya is mentioned as the most successful mobile banking product in world, 14 percent of mobile banking M-PESA agents are incurring losses (Mehrotra et al., 2014). Mehrotra et al., (2014) also reported that, in 2013, the growth rate of registered mobile money accounts in Bangladesh was higher than any other country.

2.6 Impact of Mobile Technology on Users' Economic Development

In case of financial transactions, the electronic payment channels put forward comparatively more advantages with more convenience, speed, accessibility, accuracy, control and privacy in general (Birch and Young, 1997; Daniel, 1999; Ramsay and Smith, 1999). However, beyond technology, human staffs become essential when there is need of personal service appreciation (Thornton and White, 2001). Ramsay and Smith (1999) called for personal service in situations when lack of knowledge or access to newer technologies and concerns of security prevail. Mobile banking facilitates a self-servicing electronic payment channel, which can be comfortably used for simple financial transactions (Mallat et al., 2001). Mallat et al., (2001) recommended the bank's branch office for complex financial transactions and other services, not included in mobile financial services' offer list.

**Figure 03: Projection of total value added by mobile technologies**
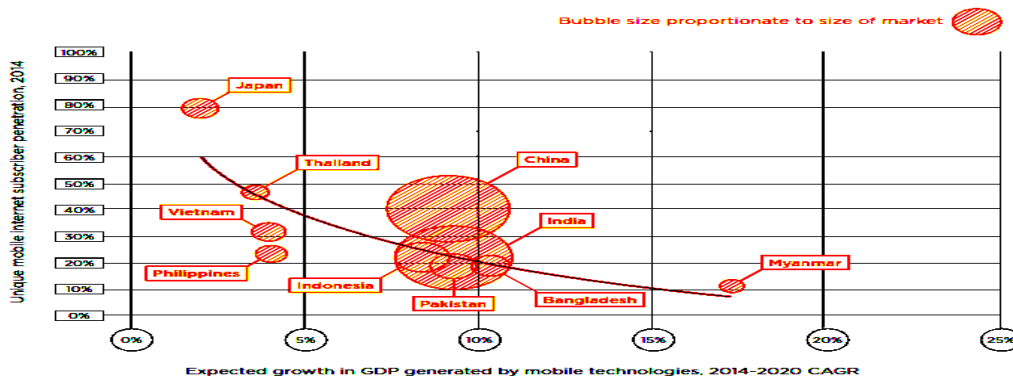
Source: GSMA, 2015

The above-mentioned figure shows the expected growth of GDP that is contributed by the mobile industry. Here, Bangladesh has a moderate level of unique mobile internet subscriber penetration in 2014 and the compound annual growth rate potential is more than 10% (GSMA, 2015). There is sufficient literature on the ground that the growth in mobile phone usage elevate the overall GDP of a country. According to Vodafone (2005), a 10 percent increase in the mobile phone usage enhances the overall GDP growth by 6 percent. While estimating the extent of contribution the mobile network operators and their related firms have on GPD, Enriquez, Schmitgen and Sun (2007) reported that firms, associated with mobile networks, contributed about twice as much as the mobile network operators to the GDP of China. Deloitte (2008) also reported similar findings

where mobile phone and its related industry had exerted a significant effect over GDP of the six considered countries.

Figure 04: Economic Impact of Mobile Communication Industry, as % of total GDP (2007)
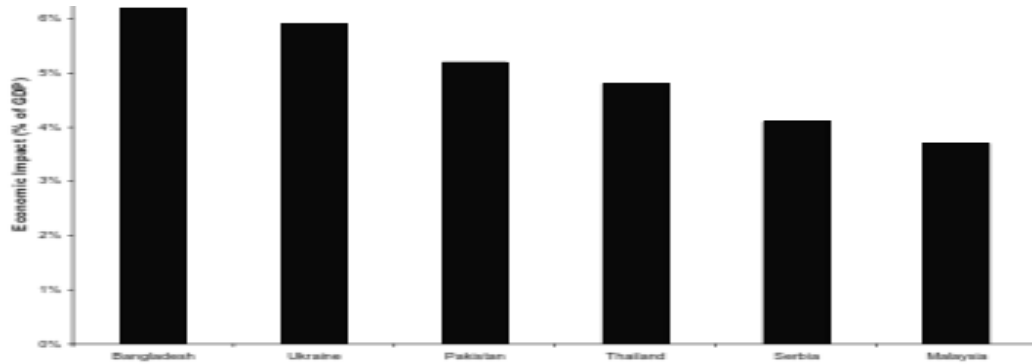
Source: Deloitte, 2008

Moreover, the government tax revenue links directly with the mobile industry. In India, mobile industry contributes $3.6 billion dollar per year with manifold ways such as license fee, import duty, tax revenue and spectrum fee (Ovum, 2006). The total tax revenue contribution has a multiplier impact on the economy when the benefit is segmented into the mobile operators, backward linkages and retailers in forward linkage (Deloitte, 2008). Deloitte (2008) analyzed six countries altogether and found that the mobile operators' contribution through direct tax is much higher than other indirect participants. The scenario becomes so because government gets the revenue directly from the companies' operations. In 2007, the mobile operators contributed, on an average, 26% of the countries tax revenue (Deloitte, 2008). However, Deloitte (2008) reported that such contribution grew to 29% when the regulatory fee was considered.

Figure 05: Tax Revenue (%) from Mobile Communications and Related Industry
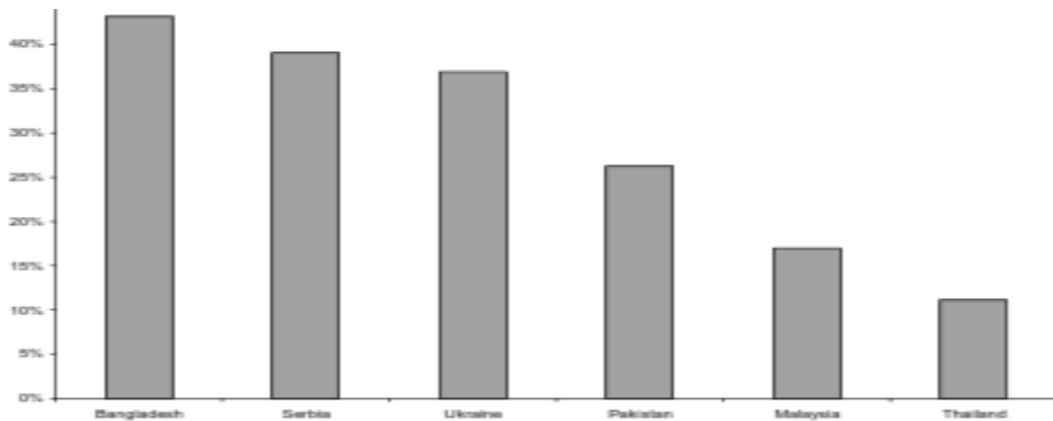
Source: Deloitte, 2008

Aside from the contribution in tax revenue, the mobile industry exerts a significant influence over the employment creation in any economy. In India, the mobile industry generated approximately 3.6 million jobs in both the direct and indirect ways and such a contribution is forecasted to be enhanced by 30% per annum (Bhavnani et al., 2008). On another study, Deloitte (2008) concluded the mobile sector played an important role in the job market of developing nations, creating about 2,44,000 jobs in Pakistan, for instance. On the six countries that were analyzed by Deloitte (2008), Serbia had the lowest but significant jobs (36,000) generated by mobile industry. Bhavnani et al., (2008) found that such jobs are highly rewarding and have a crucial knock-on impact over the retailers through SIM card sales, handsets sales and balance recharge.

Figure 06: Contribution of Mobile Value Chain to Employment
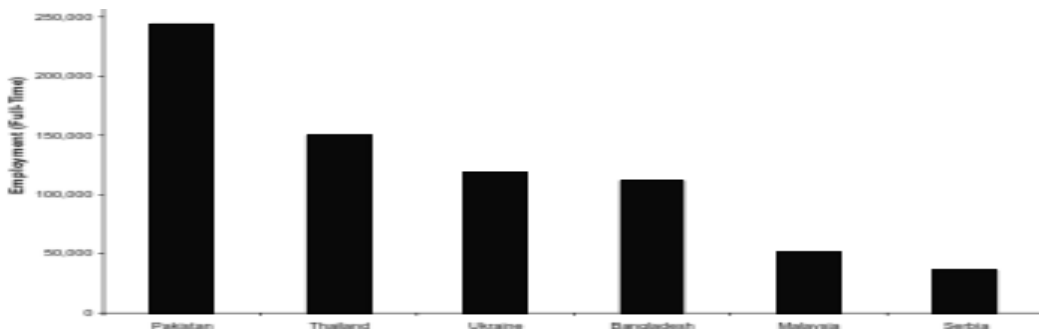
Source: Deloitte, 2008

2.7 Impact of Mobile Technology on Users' Social Development

In recent times, one of the core concerns of development economists was the dearth of cheap access to knowledge and necessary information among the poor folks in rural and remote areas (Bhavnani et al., 2008). Bhavnani et al., (2008) also reported that economists consider information as a prime prerequisite for markets to function effectively. In addition, greater reach of information is indispensable for emerging knowledge and information based economies worldwide. Such information access can also enhance skills to empower poor people and link institutions to reduce poverty (Bhavnani et al. 2008).

Figure 07: Mobile Powered Products and Services in Asia (Cumulative)
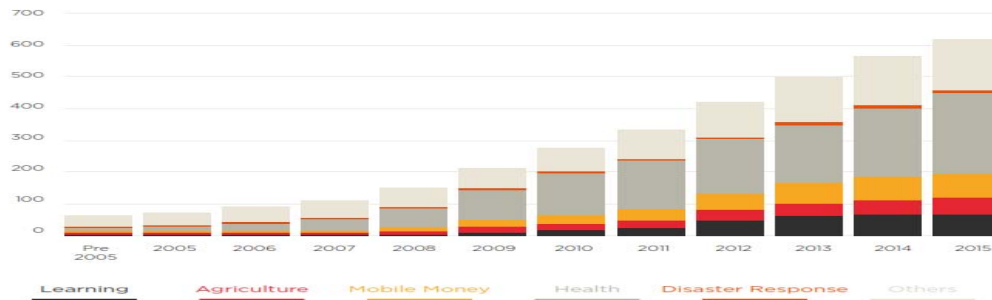
Source: GSMA, 2015

In many important social dimensions, mobile banking and the mobile network industry have a far-reaching contribution. The above-mentioned figure depicted different mobile device enabled products that accelerate the uplift of economic growth and standard of living of a nation. In studies on South African and Tanzanian communities, Goodman (2005) reported links between mobile usage and social capital in rural communities. Health and educational information relevant to particular locality was disseminated through mobile services. Such uses of mobile device can exert great benefits to the poor communities, deprived of sufficient education and income (Goodman, 2005).

The idea of transportation savings, developed by Enriquez, Schmitgen and Sun (2007), argued that end user of mobile phones held consumer surplus, even after deducting the service fees of operators. Such consumer surplus value was found considerably high in China and Philippines in 2005, amounting $37 billion and $4 billion respectively (Enriquez, Schmitgen and Sun, 2007). Mobile phones also help reduce the starting and operating costs of business. In China, live-in housekeepers get more customers with the mobile phone service and porters can only go to places where jobs are available, irrespective of wasting time and efforts searching for jobs (Chipchase, 2006). A substantial number of women in Pakistan started their own small business, offering hairdressing and beauty services, where customers communicate through mobile phones. In Thailand, passengers of taxi rides find co-passengers and share the hiring cost by using mobile devices.

One of the superior advantages of mobile devices is that it reduces asymmetric information in market and enable users to gain from trade opportunities through arbitrage (Bhavnani et al., 2008). In a study over anglers in Kerala state of India, Jensen (2007) found that mobile phone usage boosted sales volume and reduced wastages in selling fishes as anglers gained price information of potential customer and had better sales coordination. On the customers' side, the price variation across places reduced notably since mobile phone usage began in 1997 (Jensen, 2007). Moreover, by ensuring an affordable information access, mobile devices are contributing in correcting market inefficiencies. In Bangladesh, such a successful example is the Pallitathya, which enabled information access to rural people and kindled diverse economic opportunities to less privileged women (Bhavnani et al., 2008). Bhavnani et al., (2008) also reported that the Pallitathya offered services through a mobile device based model in its pilot phase in four selected villages of Bagerhat, Magura, Jhenaidah and Nilphamari districts. The five influential services were eradicating the intermediary's exploitation, offering job opportunities to rural women, saving time and cost, reducing information gap and strengthening access of service providers (Bhavnani et al., 2008).

2.8 Constructs Used in Studying Mobile Banking

Banking through electronic means has been adequately captured in literature. However, such literature focused mainly over the internet banking or online banking. In this regard, banking via mobile devices has received a comparatively little or underrated focus by researchers (Suorantia

and Mattila 2004; Laukkanen and Pasanen 2008; Püschel et al., 2010). Brown et al. (2003) employed innovation diffusion theory and decomposed theory of planned behavior on 162 survey respondents and found that perceived advantages, opportunity to test mobile banking, required number of services and associated risk had significant influence over mobile banking adoption. Through eight rigorous interviews, Lee et al., (2003) concluded that compatibility and relative advantages supported mobile banking adoption and perceived risk has had negative impact over such adoption. However, attitude also played a good role here and self-efficacy and prior experience formed attitude to be positive or negative (Lee et al., 2003). With 1253 respondents, Suoranta and Mattila (2004) applied the Bass Diffusion Model to categorize respondents into non-user, occasional user and regular user based on their experience and density of mobile banking usage. Therefore, interpersonal influence was found more influential than the mass media in mobile banking adoption (Suoranta and Mattila, 2004). Laforet and Li (2005) surveyed 128 random respondents from the city streets and found that awareness or knowledge of mobile banking influenced the adoption. However, mass media was more effective in enhancing such awareness than interpersonal word-of-mouth communications (Laforet and Li, 2005). While employing the extended technology acceptance model (TAM) with one additional trust based and two resource based constructs, Luarn and Lin (2005) explored the behavioral intention behind using mobile banking with 180 respondents from Taiwan. The study finding concluded that self-efficacy, credibility, financial cost, usefulness and ease of use had positive influence over such intention. While exploring mobile banking adoption through an extended TAM with 158 valid questionnaires from Malaysia, Amin et al., (2008) found perceived ease-of-use to be significantly influencing credibility and usefulness. In addition, perceived usefulness, ease-of use, credibility, normative pressure and amount of information had significant influence on human intention in adopting mobile banking (Amin et al. 2008).

In another study, Laukkanen et al., (2007) used the theory of innovation resistance of Ram and Sheth (1989) and found 18 factors within five barriers such as usage, risk, value, tradition and image. From a Scandinavian bank, Laukkanen et al. (2007) analyzed 1525 usable respondents and found the usage was the most intense barrier in adopting mobile banking and tradition barrier was insignificant. While employing the item response theory and Rasch measurement model with 178 respondents from a university of South Taiwan, Yang (2009) found transaction fees and speed motivated users to adopt mobile banking but safety measures and initial fees inhibited them. In Brazil, 3585 online respondents had offered similar results as cost of internet, service fee and perceived risk were greatest obstacles in mobile banking adoption (Cruz et al., 2010). Perceived usefulness and ease-of-use have full mediation effect on the relationship of external variables and usage behavior (Seyal et al., 2007). Prior experience with internet exerts a strong influence over the utilization of it (Mehta, 2007) and thus experience with technology usage can have a significant impact on its perceived benefit. Ownership of a technological device motivate individuals to be familiar with that technology and had favorable attitude toward the usage (Levin and Gordon, 1989; Rahim et al., 2000). Knowledge of personal computer, frequency of usage and

experience related to this technology has greater impact on its perceived benefit (Igbaria and Chakrabarti, 1990; Igbaria, 1992; Igbaria and Iivari, 1995 and Igberia et al., 1997). Performance of any specific system can largely be influenced by the users' experience associated with it (Singley and Anderson, 1985). Venkatesh and Davis (2000) found that experience enhances the intention to adopt and use a technology and their research findings included a strong moderating effect of experience over the perceived usefulness.

3. Background of the Model

After analyzing the existing literature surrounding this study's problem, several independent variables were taken under considerations; namely the knowledge of mobile banking, usage of mobile banking, experience relating to mobile banking, ICT literacy and attitude towards adopting technology. These composite variables were qualitative in nature and were believed to have a significant impact over the dependent variables of this study, i.e., Social Development and Economic Development. The literature and theories related to socio-economic development and information technology offered a good support for the stated composite variables to include.

In this study, the knowledge of mobile banking (KNW) included information related to the respondent's level of knowledge about what mobile banking is and how the process of mobile banking works. The questionnaire included queries about the respondent's acquaintances with the diverse type mobile banking services. The understanding of mobile banking mechanism is also judged by the respondent's familiarity about the technical pre-requisites of having and operating a mobile banking account. In addition, the usage of mobile banking (USE) by a particular respondent was determined by obtaining information about the diverse services he/she avails. The degree of usage under each category of services were also determined.

The respondent's experience (EXP) with mobile banking is captured through couple of variables that relates to a mobile banking users' day-to-day experience about the mechanism and convenience. Questions were asked about the simplicity, cheapness and availability of mobile banking services. The users experience regarding opening and maintaining the mobile banking account was also prevalent in this section. The respondents were asked about the accessibility, conduct and efficiency of mobile banking agents to apprehend the all-round experience. Moreover, the respondents' command over the information and communication technology (ICT) was duly addressed by the variable ICT literacy (ICTLIT). Respondents were asked about their depth of knowledge relating to ICT, usage of communication devices, level of efficiency in using such devices for information and communication purpose. Their awareness of different services offered by telecommunication companies was also attributed here.

The attitude (ATT) of a respondent towards the adoption and use of ICT in day-to-day life, particularly mobile banking, was measured through a number of questions from different aspects. Such aspects included the respondent's views on the usage and convenience of mobile banking. Respondents were also asked about the extent of financial inclusion that mobile banking offers,

inclusion of telecommunication companies in the banking channel, and other cultural and religious aspects of mobile banking. Here, the social development (SD) variable was calculated with responses relating to the significance of mobile banking in opening up new opportunities for everyone and eradicating the accessibility issues of poor folks in rural and remote places. The perception of respondents about how mobile banking is contributing to the reduction of income inequality, eliminating discriminatory customer treatments and encouraging people to use formal financial channel were also considered. Last but not the least, economic development (ED) factor accumulated the respondent's practical views regarding the involvement of mobile banking in increasing income level, lowering transaction costs, promoting habit of savings, defending expense shocks and encouraging entrepreneurship by forming capital.

Among the independent variables stated above, ICT literacy (ICTLIT) and attitude (ATT) acted as the mediating variables to test the mediating effects over the direct effects of knowledge (KNW), usage (USE) and experience (EXP) of mobile banking with the dependent variables i.e. on social development (SD) and economic development (ED). The analysis had control variables, namely Age and Gender, to achieve a good model fit and demonstrate the results in an unbiased way while holding the respondents' age and gender as constants.

Below is the graphical representation of the conceptual model and the hypotheses of this study:

Figure 08: Conceptual Model for Mobile Banking Factors Influencing Socio-economic Development in Bangladesh
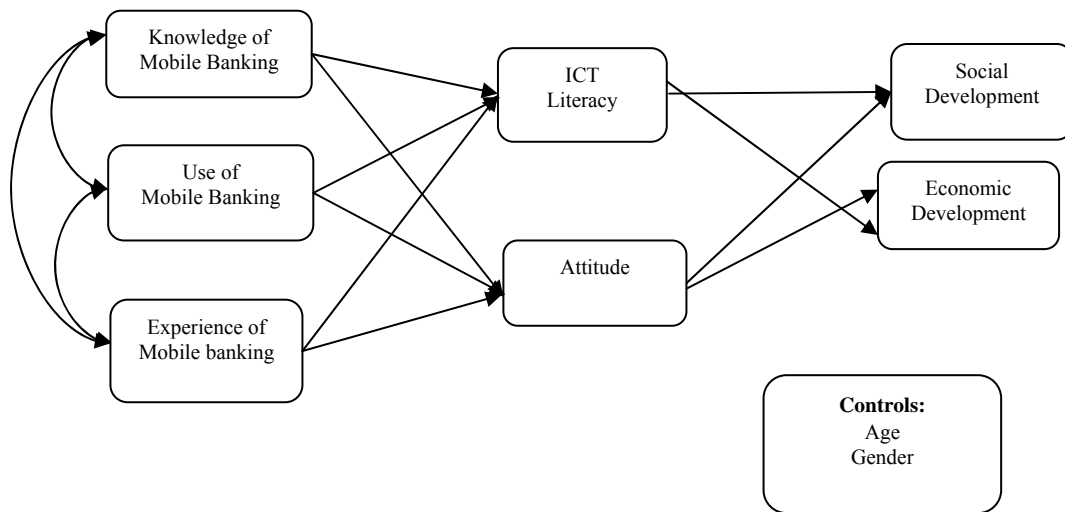
Source: Author's own construct

3.1 Hypotheses

While controlling for Age and Gender, the following mediating hypotheses were formed on the basis of previously discussed theories and existing literature.

- *Mediation*

  H1a: ICT Literacy mediates the positive effect of Knowledge of Mobile Banking on Social Development.

  H1b: ICT Literacy mediates the positive effect of Usage of Mobile Banking on Social Development.

  H1c: ICT Literacy mediates the positive effect of Experience of Mobile Banking on Social Development.

  H2a: ICT Literacy mediates the positive effect of Knowledge of Mobile Banking on Economic Development.

  H2b: ICT Literacy mediates the positive effect of Usage of Mobile Banking on Economic Development.

  H2c: ICT Literacy mediates the positive effect of Experience of Mobile Banking on Economic Development.

  H3a: Attitude mediates the positive effect of Knowledge of Mobile Banking on Social Development.

  H3b: Attitude mediates the positive effect of Usage of Mobile Banking on Social Development.

  H3c: Attitude mediates the positive effect of Experience of Mobile Banking on Social Development.

  H3a: Attitude mediates the positive effect of Knowledge of Mobile Banking on Economic Development.

  H3b: Attitude mediates the positive effect of Usage of Mobile Banking on Economic Development.

  H3c: Attitude mediates the positive effect of Experience of Mobile Banking on Economic Development.

4. Method

Quantitative research techniques were adopted in this study and tools and strategies of inferential statistics were used to test the hypotheses. To attain the necessary validity and reliability measures of the sample data, quantitative research approach is pertinent (Sandelowski, 1986). In addition, quantitative techniques would serve best in drawing inferences regarding the study's specific interest on Bangladesh.

4.1 Sampling

All the mobile phone owners who have a mobile banking account comprise the population of this study. Respondents were selected on a random basis from the database of commercial banks i.e. BRAC Bank Limited, Dutch-Bangla Bank Limited, Mercantile Bank, United Commercial Banka and Islami Bank Bangladesh Limited, which offer mobile banking services in Bangladesh. 450 clients of mobile banking services were approached to participate in this research. Participants were selected through a simple random sampling basis. As this sample size allows adequate scope

for non-responses, such a sample size can be considered substantial and appropriate according to Krejcie and Morgan's (1970) standard sampling procedure. 357 operational responses were collected after three reminders with a 79.33% response rate.

4.2 Measurement

The sample data were collected with a self-administered questionnaire. Several interviews with focus group of survey participants and suggestions from experts in mobile banking sectors aided to improve the survey questionnaire. Several other developments in the wording and order of questions were done based on extensive pretesting by pilot study. The survey included questions about respondents' social development, economic development, knowledge regarding mobile banking, usage of mobile banking features, experiences of mobile banking services, ICT literacy and attitude towards adopting and using ICT in their daily life. Each component was measured through a composite score from a number of questionnaire items specifically designed for this research. A 5-point Likert scale (5 = Strongly Agree … 1 = Strongly Disagree) was used to measure the degree of influence that each item exerts on social and economic development of respondents. Respondents' average age and education were 35-50 (SD=.762) and graduate (SD=.937) respectively. 25% of the respondents were female.

4.3 Analytical Tools

IBM SPSS (version 22) and IBM SPSS AMOS (version 22), two statistical software of multivariate data analysis, were used to analyze the survey data. Data screening was performed for outliers and missing values, to have valid findings. Factor analysis was used to screen variables on the basis on their extent of correlations.

5. Survey Results and Analysis

5.1 Data Screening

Univariate

- Missing Data: Att3 and IctLit1 had four and two missing values respectively, which were imputed through the median value of the series. As these items were measured by Likert Scale, median imputation was performed for both of the ordinal variables. The control variables had values missing also. These missing values (Age = 2 missing and Education = 3 missing) were imputed by series mean, as they were continuous variable.

- Outliers: Five point Likert Scale was used to measure all the items of this study. Thus, the possibility of extreme value outlier does not exist. However, the control variables were tested for outliers by scrutinizing box plots on respective variables. Six respondents had exceptionally high values but there was no substantial theoretical ground to mark them as incorrect and remove them from the study. Therefore, they were simply considered as high responses.

- Normality: The independent and dependent variables were all measured with Likert Scale tool and thus, there was no sufficient base to eliminate variables based on Skewness, except for the

variables that depict no variance at all. Hence, the test of normality was performed with Kurtosis values. Absence of adequate variance can be confirmed if the Kurtosis values go beyond the -/+ 2 limit (Kim, 2013). Kurtosis value of all the variables relied in between +1.6 and -1.3, except for the cases of SD1 (2.091), SD3 (2.540), SD4 (2.138) and ED2 (2.055) (see in appendix 1). However, as SD1, SD3, SD4 and ED2 have borderline kurtosis value as compared to the standard, they were kept in the study with consideration for likely issues in subsequent analyses. As most of the variables' Kurtosis value fall in between the -/+ 2 limit, the sample data were considered to have adequate level of variance.

5.2 Multivariate Assumptions

The following tests were performed after constructing the measurement model.

- Linearity: For testing linearity of established direct relationships of the measurement model, regression technique with curve estimation was used. However, the p-values of only four of the established relations were less than 0.05 (see appendix 2). Rest of the relationships were not sufficiently linear, which can be noted as the study's limitation.

- Homoscedasticity: With zResid on Y axis and zPred on X axis, scatter plots were constructed for all the factors and the plots depicted a consistent linear relationship between the residuals (error terms) and the factors' predicted values (see appendix 5). As there was consistency in error variance against the different predicted values of factors, the factors can be considered as homoscedastic.

- Multicollinearity: For all the three exogenous variables namely Knowledge (KNW), Usage (USE) and Experience (EXP), Variance Inflation Factors (VIF) were tested by putting one variable as dependent and other two as independent variables and vice versa (see appendix 3). As all the VIFs values were less than 2.0, the exogenous variables can be considered as distinct and the model is free from multi-collinearity issues.

5.3 Exploratory Factor Analysis

Maximum Likelihood[1] method with Promax Rotation[2] was used for exploratory factor analysis of the survey data. The objective was to test that whether the considered variables loaded in the similar groups as predicted or not. Furthermore, the adequacy of correlation, reliability, and validity criteria were also tested through this exploratory factor analysis. All of these essential analyses are reported below for the finalized seven-factor model as shown in pattern matrix (see appendix 10).

- Adequacy: Kaiser-Meyer-Olkin Measure of Sampling Adequacy (.885) and Bartlett's test presented adequate level of sampling adequacy for the model (see appendix 4). Variables depicted sufficient communalities as most of them were above 0.65 and all were above 0.30 (see appendix 9). However, due to low loadings in communalities, Knw5, Att5, IctLit5 and ED1 were removed from the initial model through iteration and the presented model was finalized. These three variables were also removed from the Kurtosis table, as they were

unnecessary for in describing normality of the present model. Therefore, it can be concluded that the finalized variables were adequately correlated for being used in factor analysis. The 7-factors model and its components' adequacy were additionally tested through reproduced correlation matrix as it showed only 2% non-redundant residuals with absolute values greater than 0.05.

- Reliability: The Cronbach's alpha values were computed for testing factors' reliability. All alpha values correspondent to the factors were significant as they were far beyond 0.70 (see appendix 6). Thus, the factors were highly correlated and fundamentally interchangeable. Therefore, the factors were found to be reflective as according to Jarvis et al. (2003).

- Validity: With a sample size of 300, if all of the factor loadings are above the minimum threshold of 0.350, the factors are considered to have adequate convergent validity ((Hair, Ringle and Sarstedt, 2013). In this 7-factors model, all of the loadings were mostly 0.70, where the least value is 0.475 for SD5 (see appendix 10). The seven-factors also exhibited sufficient discriminant validity because the factor correlation matrix did not list any correlation above 0.700 (see appendix 7). There were also no instances of problematic cross-loadings between factors. The Chi-Square value (455.626) was found significant in the Goodness-of-Fit test (see appendix 8). The total variance explained of the 7-factors model was about 62.050%, having initial eigenvalues above 1.0 for all the factors (see appendix 11).

5.4 Confirmatory Factor Analysis

- Model Fit: For having further improvements in the model, error terms of Exp1 and Exp2, Exp3 and Exp4, ED2, ED4 and ED5were correlated after consultation with modification indices. As a result, the measurement model depicted sufficient goodness of fit while tested with different matrices. Below mentioned table summarizes the results from all of the fit indexes:

[1]Maximum Likelihood Estimation was used for determining the unique variance among studied items and correlation between factors. It also offers a goodness of fit test for factor solution and is essential for remaining consistent with subsequent Confirmatory Factor Analysis.

[2]Promax accounts for the correlated factors and it is helpful for a relatively large (n=357) dataset.

Table 02: Model Fit

Metric	Observed value	Recommended
cmin/df	1.378	Between 1 and 3
CFI	0.976	>0.950
NFI	0.919	Acceptable between 0.900 and 0.950
IFI	0.976	>0.900
RMSEA	0.033	<0.060
PCLOSE	1.000	>0.050
SRMR	.0408	<0.090

Source: Author's own calculation

- Validity and Reliability: While testing the convergent validity of measurement model, the Average Variance Extracted (AVE) values were much strong for factors as they were above the minimum threshold of 0.50, except for the case of KNW (0.429) (see appendix 12). However, this factor was retained in the model even after it did not meet the minimum AVE requirement because its AVE values was borderline (Fornell and Larcker, 1981).In addition, KNW variable did not have any discriminant validity issues and its reliability estimates were substantial. This factor was discriminant enough as its square root of AVE was sufficiently higher than its correlation values with other factors. The discriminant validity for all the other factors was found sufficient when the inter-factor correlations were compared with the diagonal values of individual factors. The diagonal values (square root of AVEs) were significantly higher in most of the cases in the diagonal matrix (see appendix 12). Apart from these two validity tests, the factors depicted adequate validity in the Composite Reliability (CR) test too. All the factors had significant CR values, much greater than 0.70 and thus, the factors can be considered as reliable.

Figure 09: Measurement Model
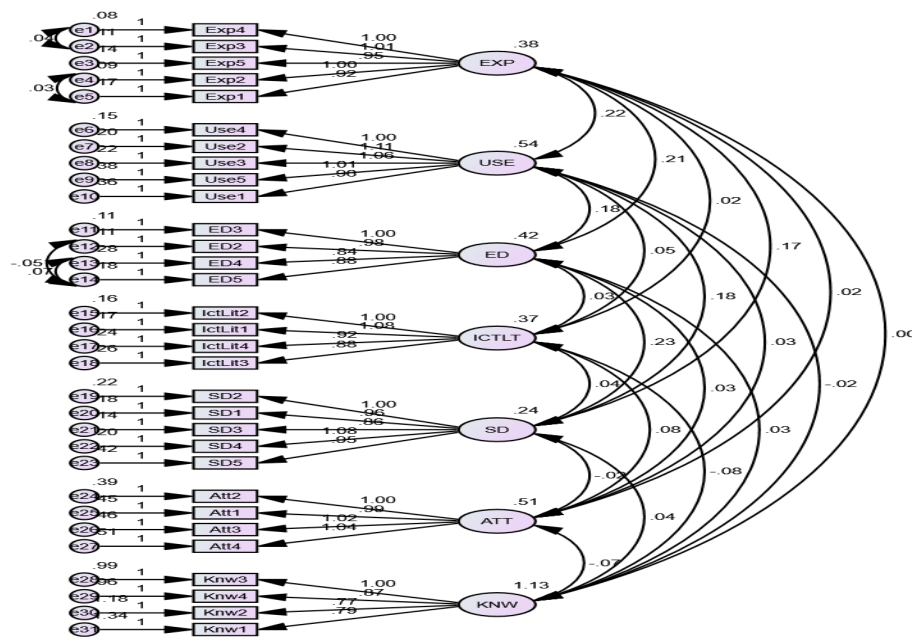
Source: Author's own construct

- Common Method Bias: Responses regarding the independent and dependent variables were collected through a specific questionnaire, the only survey instrument. Therefore, there might be the existence of common method bias. As with Podsaloff et al. (2003), Harman's Single Factor Test was conducted to check if results of the measurement model were affected by any common method bias. Given there is common method bias, the one factor solution would load all the 35 items, used to measure the independent and dependent variables, into a single factor. According

to Mossholder et al. (1998), if the single factor model adequately fits the collected data, it can be concluded that common method bias is mostly responsible for explaining the relationships between variables. The total variance explained for this single factor model was only 23.687% (see appendix 13). Moreover, the model fit indices exhibited values, such as $\chi2/df$ (NA), CFI (1.000), NFI (1.000), IFI (1.000), RMSEA (0.198), PCLOSE (0.000) and SRMR (NA), which were all unsatisfactory for this single factor model. Thus, it can be concluded that the single factor model did not adequately fit the data and consecutively, the existence of common method bias should not be presumed.

5.5 Hypotheses

While controlling for Age and Gender, the previously stated hypotheses were tested. However, Education could potentially predict the dependent variable but it was not directly related to the study's interests. As there were two mediating variables (ICTLIT and ATT), the path between ATT and the variable under consideration was excluded while testing the mediating effect of ICT and vice versa. These measures were crucial for devising enough power to test each set of hypotheses and to preserve theoretical parsimony and precision.

- *Mediation*

    H1a-c: ICT Literacy mediates the positive effect of Knowledge, Usage and Experience of Mobile Banking on Social Development.

    H2a-c: ICT Literacy mediates the positive effect of Knowledge, Usage and Experience of Mobile Banking on Economic Development.

    H3a-c: Attitude mediates the positive effect of Knowledge, Usage and Experience of Mobile Banking on Social Development.

    H4a-c: Attitude mediates the positive effect of Knowledge, Usage and Experience of Mobile Banking on Economic Development.

5.6 Structural Equations Model

- Composite variable: The full structural model was abridged through using composite variables. Such composite variables were generated with factor scores in SPSS AMOS.

- Model fit: The structural model exhibited adequate fitas the values for model fit indices, such as $\chi2/df$ (2.993), CFI (0.962), NFI (0.946), IFI (0.963), RMSEA (0.075), PCLOSE (0.054) and SRMR (0.0405), were all satisfactory. With consultation of modification indices, the error terms of Social Development (SD) and Economic Development (ED) were co-varied. The correlations between the independent variables, assumed in the theoretical model, were eliminated for achieving good model fit, except for the cases of USE and EXP. The finalized model is as follows:

Figure 10: The Structural Equations Model of Socio-economic Impact of Mobile Banking
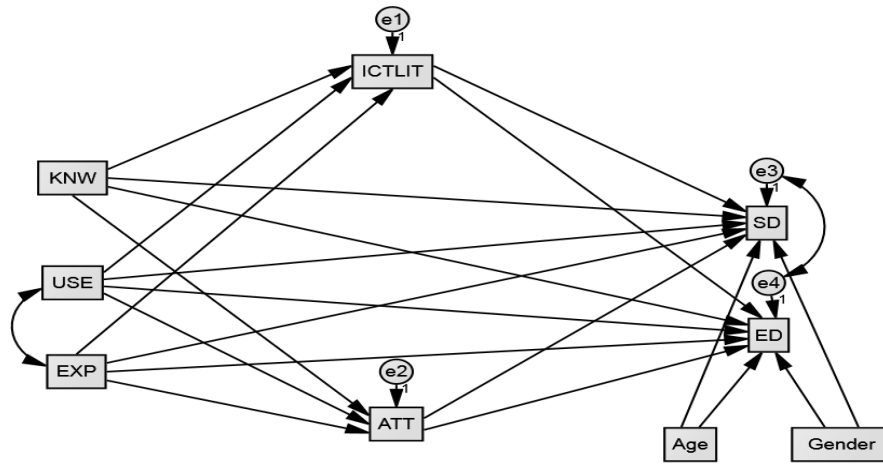
Source: Author's Own Construct

6. Findings

With SPSS AMOS, the hypothesized directs effects of the independent variables (KNW, USE and EXP) over the dependent variables (SD and ED) were examined. In addition, Bootstrapping resamples technique (bias corrected = 2000) was used to test the hypothesized effects of mediating variables (ICTLT and ATT) on the relationship among the dependent and independent variables. The partial mediation effects were analyzed by comparing the values of direct and indirect effects, generated while model fitting. Only the indirect effects were examined to test full mediation. The following table summarizes the findings of hypothesis testing.

Table 03: Test of Hypotheses

	Evidence			Mediation Type
	Direct effect without Mediation	Direct effect with Mediation	Indirect effect	
H1a: KNW→ICTLIT →SD	.102***	.111***	-.008***	Partial Mediation
H1b: USE→ICTLIT →SD	.321***	.330***	.015***	Partial Mediation
H1c: EXP→ICTLIT →SD	.443***	.416***	-.001 (NS)	No Mediation
H2a: KNW →ICTLIT →ED	.062 (NS)	.092***	-.019 (NS)	No Mediation
H2b: USE →ICTLIT →ED	.148***	.163***	.006 ***	Partial Mediation
H2c: EXP →ICTLIT →ED	.490***	.470***	.000 (NS)	No Mediation
H3a: KNW →ATT→SD	.102***	.110***	.012***	Partial Mediation
H3b: USE →ATT →SD	.321***	.332***	-.004 (NS)	No Mediation
H3c: EXP→ATT →SD	.443***	.414***	-.003 (NS)	No Mediation
H4a: KNW →ATT →ED	.062 (NS)	.096***	-.005 (NS)	No Mediation
H4b: USE →ATT →ED	.148***	.164***	.002 ***	Partial Mediation
H4c: EXP →ATT →ED	.490***	.472***	.001 (NS)	No Mediation

Source: Author's own calculation

7. Discussion

The core focus of this study was to examine the impact of some selected qualitative factors related to mobile banking, measured by several variables, on the social and economic development of the users. The study used a structural equations modeling approach to confirm the identified hypotheses regarding the direct effects of three independent variables, namely knowledge (KNW), usage (USE) and experience (EXP) of mobile banking, over the dependent variables termed as social development (SD) and economic development (ED). The mediation effects of two other independent variables, such as ICT literacy (ICTLIT) and attitude (ATT), were also incorporated in the structural equations model to test their influence over the direct effect of knowledge (KNW), usage (USE) and experience (EXP) of mobile banking. Theories relating to information technology, social development and economic development offered adequate support on establishing constructs between the considered variables in the model. Age and gender acted as the control variables of this model.

This study analyzed data from 357 respondents, which were collected through self-administered questionnaire. All of the considered independent variables relating to mobile banking offered significant direct effects on social and economic development, except for the direct impact of knowledge (KNW) of mobile banking over economic development (ED).

Survey findings reported that ICT literacy confirmed three hypotheses out of total six hypotheses relating to social and economic development. The mediation effects assumed in hypotheses H1a, H1b and H2b were accepted. Therefore, ICT literacy mediates the positive impacts of knowledge and use of mobile banking on social development. By ascertaining a partial mediation in H2b, ICT literacy mediated the positive effects of use of mobile banking on economic development. The findings relate to the study outcome of Kozma (2005) and Warschauer (2004) where ICT played a good role in social and economic development. However, several noteworthy issues were mentioned by Heeks (2002) and Heeks (2008), which could act as barriers on the way of ICT's contribution towards social development.

Attitude (ATT) of mobile banking users had mediation effects on the hypothesized positive relationship of knowledge (KNW) of mobile banking and social development (SD). In addition, attitude (ATT) of mobile banking also mediated the direct effects of usage (USE) of mobile banking services over economic development (ED). Laforet and Li (2005) also confirmed the similar sort of impact of attitude over mobile and online banking from Chinese context. Kai-ming and Enderwick (2000) developed a model for assessing the contribution of attitude on technology adoption where attitude was an influential variable in adopting and using technology. Studies examining the adoption (Lin, 2011) and usage of mobile banking (Laun and Lin, 2005) have also found attitude related impacts parallel to this studies outcome. However, the other hypotheses did not offer sufficient test statistics to confirm the hypothesized mediation effects. While testing for model validity, the structural equations model came up with adequate evidence to be considered as

convergent and discriminant. The internal consistency and indicator reliability were also sufficient while accounted for the model's reliability tests.

7.1 Insights Gained

Lot many noteworthy studies were accomplished on the field of mobile banking and its diverse aspects. Among those aspects, adoption of mobile banking and the financial point of views was mostly highlighted. However, impact study of those qualitative aspects of mobile banking over the social and economic development of the users are quite infrequent. This study particularly considered the impact some selective qualitative factors (knowledge, usage and experience of mobile banking) over the socio-economic development of mobile banking clients and thus attempted to fill the prevailing research gap. Moreover, this study's respondents and context were solely based on Bangladesh and thus, addressed the specific significance of the qualitative aspects from the perspective of Bangladesh.

7.2 Problems Identification and Managerial Implications

After analyzing the study's findings, it is obvious that the commercial banks should focus more over the qualitative factors that has direct association with the mobile banking procedure and its ultimate impact. In this case, special considerations should be allowed for those qualitative variables that influence the literacy of mobile banking, adopting it in practical life and using it for uplifting the social and economic status. Some of the key aspects of the observed factors are listed below:

- The concurrent condition of mobile banking knowledge can be placed in the growth stage. The sample respondents were adequately informed about the mobile banking term. In addition, the responses offered sufficient positive knowledge about the technical side of mobile banking. Respondents had adequate knowledge about the accessibility requirements, i.e. active SIM card and the essential hardware, i.e. mobile device. However, respondents had knowledge gaps about the operational procedure, service offerings and regulatory requirements of opening and managing mobile banking accounts.

- The usage of mobile banking in the survey respondents was high. However, the respondents were concentrated only in some basic functionalities from an array of mobile banking services. The cash-in, cash-out, fund transfer and viewing summarized account statements were the mostly used services. Next to these services, respondents used mobile banking to recharge cell-phone balance, receive remittance, purchase tickets and paying academic fees. Nevertheless, the least used services were namely paying utility bills and pay salary to workers or office staffs.

- The overall experience of mobile banking clients was positive. The survey respondents were significantly affirmative on the availability of mobile banking services at 24/7 on 365 days. They perceive the transaction process quick and robust, as they had no instances of technical

malfunctions. Respondents were contented with the simplified user interface in mobile, no or less paperwork in transaction process and easy account opening procedure. They found mobile banking agents at convenient places and perceived the customer service from agents and help lines as efficient. Decent responses were found about the addressing of customers' queries and resolving complaints.

- ICT literacy factor offered a somewhat mixed picture of ICT readiness and depth of IT knowledge in the mobile banking clients. Respondents' demography played a vital part here. City-oriented and well-educated respondents scored comparatively higher in ICT literacy. They had good command over information and communication technology and are found efficient in operating communication devices. They ensured expertise in communication media i.e. e-mail and social networking, and depicted a decent level of understanding in the terms, conditions and features of different services offered by telecommunication companies and mobile banking service providers. The scenario was not so commendable for respondents from rural areas and with little or no formal education.

- The sample respondents exhibited affirmative attitude about accomplishing financial transactions through mobile devices. They perceived mobile banking as a convenient solution to financial services and a substantial tool of financial inclusion. They supported the view that mobile technology can reach more people with banking services and it could serve as one-stop financial service point. According to the study results, respondents found the transaction process of mobile banking as transparent and not offending any religious or cultural views. Respondents believer that, by eliminating bureaucratic obstacles, mobile banking saves time and costs and incorporation of telecommunication companies in the process will have positive impact in the reach, number of clients and volume of transaction. They perceived that telecommunication firms' brand value, proven marketing strategies, robust distribution channel and customer service points would be effective for serving mobile banking clients.

- Respondents offered substantial instances of social development associated with mobile banking services. They confirmed that mobile banking has opened up new windows of opportunities for both individuals and businesses. In addition, mobile banking has empowered the poorer section of society through bringing banking services to underprivileged areas and unbanked people. Respondents also remarked the contribution of mobile banking in reducing income inequality and increased access to a diverse set of financial services. By ensuring a fair and equal customer treatment, mobile banking encouraged people to use formal channel for financial transactions. Finally, with custom-made financial services, the unbanked ones were included into financial channels that encouraged their saving habit and enhanced their pliability to expense shocks. However, respondents urged for including other core banking products and more innovative financial services in the concurrent offered list of mobile banking.

- The study results advocated that adoption of mobile banking contributed to the economic development of its clients. Respondents found that mobile banking intensely eased up the funds flow and thus, increased the business volume and profit potentials. By eliminating the accessibility issues, it enhanced the income of both mobile banking clients and service providers with increased customer base for both the parties. The time lag and costs associated with paperwork and travelling to financial institutions were dramatically reduced. With lower transaction costs, businesses can now retain more from income as profit. Study results suggested that mobile banking enhanced the asset volume of clients with remittance and accumulation of scattered deposits. Thus, by forming a strong capital base, mobile banking stimulated entrepreneurship and created more jobs for unemployed. The respondents urged for policy makers' consideration on a more flexible charge per transaction and rationalizing it with transaction volume.

This study used a number of qualitative variables that offered noteworthy influence over essential contexts of mobile banking. Thus, it is advisable that the policy making bodies, responsible for making and developing regulations, and the concerned parties, who offer the mobile financial services, give substantial weight age on the observed variables, their potential impacts and issues exposed by the study's outcome.

7.3 Limitations

The study was conducted with a relatively small sample size of 357 respondents, randomly selected through convenient sampling procedure. In addition, some of the direct relationships between the variables in measurement model was non-linear. A more comprehensive experimental research could present better comprehension of the study's problem. Therefore, the generalizability of this study's outcome can be limited.

7.4 Opportunities for Future Research

To explore more about the impact of qualitative aspects of mobile banking over socio-economic development of its clients, future research is suggested with a comparatively large number of sample size. Sampling can be more clustered with large geographical dispersion to find generalizable results on a bigger context. Other personal traits, behavioral attributes and psychological factors can be included for getting a multi-dimensional qualitative analysis. The same can be done with a mix of qualitative and quantitative variables to form a structural equations model. Field experiments can be quite useful in judging such sort of relationships and moderating variables from different perspectives can be tested.

8. Conclusion

Mobile banking has a comprehensive impact over the social and economic development of its users. Aside from the quantitative aspects, the primary contribution of this study was to fill the literature gap by analyzing the socio-economic impact of some selected qualitative factors relating

to mobile banking. With adequate attention, investment and promotion over these studied factors, this financial product can bring a revolution in the sector of inclusive finance in Bangladesh. As according to the study's findings, continuous focus of service providers over the knowledge, usage and experience of mobile banking has become a necessity for amplifying the positive impact of mobile banking on socio-economic status of its users. Likewise, policymakers should put more weightage on the spread of ICT literacy and create a positive environment for all-round adoption of ICT in every sector of Bangladesh. Given the concerned parties proper consideration to suggested actions, the level of financial inclusion and impact of mobile banking in Bangladesh could be heightened momentously.

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Appendices

Appendix 1: Kurtosis

	N		Kurtosis
	Valid	**Missing**	
Knw1	357	0	-1.342
Knw2	357	0	-1.204
Knw3	357	0	-1.367
Knw4	357	0	-1.200
Att1	357	0	-0.829
Att2	357	0	-0.743
Att3	357	0	-0.424
Att4	357	0	-0.983
Use1	357	0	-0.260
Use2	357	0	-0.192
Use3	357	0	0.256
Use4	357	0	1.417
Use5	357	0	-0.433
Exp1	357	0	1.169
Exp2	357	0	1.647
Exp3	357	0	1.156
Exp4	357	0	1.422
Exp5	357	0	1.190
IctLit1	357	0	0.869
IctLit2	357	0	0.933
IctLit3	357	0	0.708
IctLit4	357	0	1.651
SD1	357	0	2.092
SD2	357	0	1.002
SD3	357	0	2.541
SD4	357	0	2.139
SD5	357	0	0.540
ED2	357	0	2.056
ED3	357	0	1.106
ED4	357	0	1.039
ED5	357	0	1.190

Appendix 2: Linearity test

Model Summary and Parameter Estimates			
Direct relationships	**R Square**	**F**	**Sig.**
IctLit→SD	.022	7.991	.005
IctLit →ED	.006	2.261	.134
Att →SD	.002	.876	.350
Att →ED	.006	2.248	.135
Knw→IctLit	.024	8.605	.004
Use→IctLit	.014	4.906	.027
Exp→IctLit	.004	1.331	.249
Knw →Att	.012	4.479	.035
Use →Att	.003	1.163	.282
Exp →Att	.003	1.080	.299

Appendix 3: Multicollinearity

Dependent variable	Independent vairable	VIF
KNW	USE	1.378
	EXP	1.378
USE	KNW	1.000
	EXP	1.000
EXP	KNW	1.001
	USE	1.001

Appendix 4: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.885
Bartlett's Test of Sphericity	Approx. Chi-Square	6718.941
	df	465
	Sig.	0.000

Appendix 5: Homoscedasticity
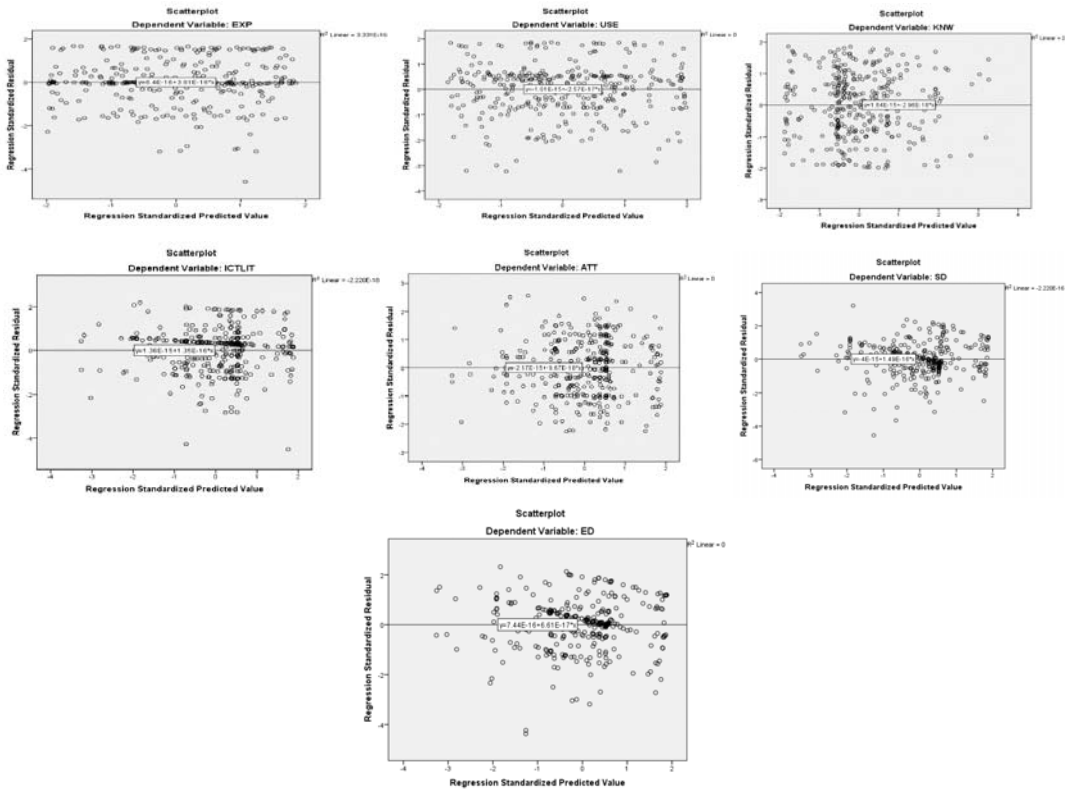
Appendix 6: Cronbach's alpha

Factor Label	Cronbach's alpha	Specification
Knowledge	0.838	Reflective
Use	0.942	Reflective
Experience	0.822	Reflective
ICT Literacy	0.893	Reflective
Attitude	0.870	Reflective
Social Development	0.914	Reflective
Economic Development	0.829	Reflective

Appendix 7: Factor Correlation Matrix

Factor	1	2	3	4	5	6	7
1	1.000	.476	.509	.041	.525	.056	.008
2	.476	1.000	.373	.097	.490	.059	-.031
3	.509	.373	1.000	.052	.660	.073	.064
4	.041	.097	.052	1.000	.122	.182	-.125
5	.525	.490	.660	.122	1.000	-.040	.071
6	.056	.059	.073	.182	-.040	1.000	-.090
7	.008	-.031	.064	-.125	.071	-.090	1.000

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalization.

Appendix 8: Goodness-of-fit Test

Chi-Square	df	Sig.
455.626	269	.000

Appendix 9: Communalities

	Initial	Extraction
Knw1	.330	.364
Knw2	.332	.373
Knw3	.431	.566
Knw4	.384	.474
IctLit1	.638	.714
IctLit2	.622	.718
IctLit3	.485	.532
IctLit4	.537	.568
Att1	.453	.538
Att2	.498	.622
Att3	.495	.517
Att4	.465	.522
Exp1	.690	.648
Exp2	.782	.786
Exp3	.816	.849
Exp4	.843	.886
Exp5	.695	.688
Use1	.575	.577
Use2	.730	.783
Use3	.701	.738
Use4	.729	.786
Use5	.593	.597
SD1	.539	.570
SD2	.516	.572
SD3	.530	.559
SD4	.559	.588
SD5	.366	.330
ED2	.710	.732
ED3	.746	.839
ED4	.611	.565
ED5	.653	.631

Extraction Method: Maximum Likelihood.

Appendix 10: Pattern Matrix

	Factor						
	1	2	3	4	5	6	7
Exp4	.965						
Exp3	.932						
Exp5	.830						
Exp2	.816						
Exp1	.776						
Use4		.913					
Use2		.903					
Use3		.830					
Use5		.768					
Use1		.697					
ED3			.941				
ED2			.854				
ED4			.695				
ED5			.674				
IctLit2				.859			
IctLit1				.825			
IctLit4				.746			
IctLit3				.726			
SD2					.759		
SD1					.755		
SD3					.708		
SD4					.626		
SD5					.475		
Att2						.798	
Att1						.737	
Att3						.700	
Att4						.693	
Knw3							.756
Knw4							.675
Knw2							.599
Knw1							.581

Extraction Method: Maximum Likelihood.

Rotation Method: Promax with Kaiser Normalization.[a]

a. Rotation converged in 6 iterations.

Appendix 11: Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	8.526	27.505	27.505	8.023	25.882	25.882	6.178
2	3.348	10.801	38.306	2.495	8.050	33.931	5.466
3	2.455	7.919	46.225	2.148	6.927	40.859	5.563
4	2.407	7.763	53.988	2.203	7.108	47.966	2.758
5	2.135	6.888	60.876	1.976	6.374	54.341	5.891
6	1.933	6.236	67.113	1.626	5.245	59.586	2.340
7	1.091	3.518	70.631	.764	2.464	62.050	1.836

Extraction Method: Maximum Likelihood.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

Appendix 12: Validity and Reliability

	CR	AVE	ATT	EXP	USE	ED	ICTLT	SD	KNW
ATT	0.823	0.537	0.733						
EXP	0.938	0.751	0.049	0.867					
USE	0.917	0.690	0.051	0.489	0.831				
ED	0.896	0.684	0.072	0.533	0.378	0.827			
ICTLT	0.871	0.628	0.193	0.055	0.106	0.072	0.792		
SD	0.840	0.514	-0.048	0.558	0.503	0.712	0.133	0.717	
KNW	0.749	0.429	-0.091	0.005	-0.028	0.050	-0.130	0.080	0.655

Appendix 13: Harman's single factor test (Total Variance Explained)

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.077	26.923	26.923	7.106	23.687	23.687

Extraction Method: Maximum Likelihood.