Student evaluation of e-service quality criteria in Uganda: the case of automatic teller machines

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Abstract

Purpose – This study aims to identify the most important e-service quality evaluation dimensions in an emerging market context, focusing specifically on automatic teller machines (ATMs).

Design/methodology/approach – The study employs a triangulation approach, using both qualitative and quantitative methods based on a convenience sample composed mainly of students at Uganda Christian University. Instrument development was based on the results of a qualitative study. The psychometric properties of this instrument were assessed using exploratory factor analysis followed by cross-validation using confirmatory factor analysis. This was followed by hierarchical linear regression to identify the most important dimensions of e-service quality.

Findings – The study establishes that tangibles, card issues, reliability and location are the most important student service quality evaluation dimensions of ATMs in Uganda.

Research limitations/implications – The study utilized a convenience sample of mainly college age students; however, many of them are working and engaged in business activities.

Practical implications – Managers should consider the identified dimensions when designing an ATM network to encourage usage of ATM facilities and decongest their banks.

Originality/value – This study is one of the few of its nature in an emerging market context.

Keywords E-service quality, Evaluation criteria, Customer satisfaction, ATM, Uganda

Paper type Research paper

Introduction

Many innovations have influenced the way organizations operate. Foremost among these innovations are electronic self-service technologies which are defined as services driven by information technology that enable customers to acquire a service without direct employee involvement, an example of which is automatic teller machines (ATMs). For banks, empowering customers with the option of using technology-based service delivery systems reduces costs and improves the overall efficiency of operations (Alstad, 2002; Joseph and Stone, 2003) and should result in enhanced customer satisfaction, leading to customer retention and increased profits (Reichheld and Sasser, 1990). However, mere provision of technology facilitated service options in itself does not guarantee customer satisfaction (Anthes, 1998; Hall, 1998). The quality of the service rendered by technology is one of the main factors that determine the success or failure of electronic commerce (Santos, 2003). However, e-service quality has been evaluated as inferior by many customers (Rubino, 2000). This view is backed by the existence of business and academic evidence that shows dissatisfaction with service quality delivered through the internet (Ahmad, 2002). Many observers of e-services contend this situation continues to persist (Gaudin in Parasuraman et al., 2005).

A customer presented with a service implicitly decides what aspects of that service are most important (Loudon and Della Bitta, 1988) based on some evaluative criteria.

This evaluation is directly influenced by the attributes associated with that service (Dabholker, 1996). Put another way, customers judge service quality depending on a number of factors relevant to the context. Many attempts have been made to understand and measure e-service quality. Most of these efforts have focused on online shopping with limited attention to other service contexts (Li and Suomi, 2007). These endeavors have confirmed the existence of variability in the dimensions of e-service quality (Li and Suomi, 2007) which means that most measures of e-service quality that have been developed differ in dimensions and attributes. Besides, most measures are ad hoc and have not been validated, potentially leading to poor managerial decisions (Zeithaml, 2002). Further, while several e-service dimensions may be important, only a few are most important from the customer's perspective (Joseph and Stone, 2003). Studies, both qualitative and quantitative, show that differences do exist in acceptance and usage levels of technologies across customer segments depending on their technology beliefs (Dabholker, 1996). These studies also suggest that similar differences are found in the evaluative processes used in judging electronic service quality.

Automated service quality research has been limited to relationship management rather than the metrics of service quality (Buckley, 2003). Most of this research has been viewed from the service provider's perspective rather than the customer's perception of service quality (Zhu et al., 2002). Thus, management needs to understand how the customer evaluates e-service quality as a foundation for improving that service (Zeithaml, 2002). Overall, literature calls for more research on the impact of information technology-driven services on the customer's perceptions of the service quality received (Zhu et al., 2002).

The purpose of this study is to identify the dimensions of e-service quality with respect to ATMs in the emerging market context of Uganda where online shopping is nonexistent and ATMs are a very recent development (Greenland et al., 2006). Specifically, the study intends to develop an instrument that can be used to measure the service quality of ATM networks. This instrument can then be used to determine the most important service criteria in such a context. The study findings are expected to assist marketers in further understanding e-service quality dimensions and to help practicing managers position their ATM networks more effectively. The remainder of the article proceeds as follows: The next section examines the literature relevant to customer satisfaction and e-service quality evaluation. The methodology used in the study is then presented, starting with instrument development followed by data analysis and findings of the study. The paper concludes with a discussion of the managerial implications of the research findings.

Literature review
Theoretical background
The study is based on the technology acceptance model (TAM) (Davis, 1989) and the expectations disconfirmation theory (EDT) (Oliver, 1980). These two studies have the advantage of providing a theory that is more encompassing and predictive than either theory alone (Venkatesh, 2005). TAM is an adaptation of reasoned action theory (Ajzen and Fishbein, 1980) to the field of information systems. The theory posits that actual use of a system is determined by the user's behavioral intentions to use the system, which is determined by users' attitudes toward using the system (mediating variable), their perceived usefulness of the system, as well as the system's ease of use (Davis et al., 1989).

Ease of use refers to the effort involved in using the technology (Dabholker, 1996). If it is too difficult to use, customers may attach little value to the system.

EDT predicts and explains consumer satisfaction with products and services. It suggests that users initially form expectations or belief probabilities of attribute occurrence. They then form post-usage perceptions about performance and a comparison between initial expectations and performance, known as disconfirmation of expectations (Spreng and Page, 2003; Oliver, 1980). A positive disconfirmation means performance was better than expected, while a negative disconfirmation means performance was less than expected. The theory proposes that better performance, or more disconfirmation, results in a greater level of satisfaction (Yi, 1990). Recent research has used EDT to explain user information technology satisfaction (Hsu et al., 2004).

Customer satisfaction and service quality

Satisfaction and quality are two concepts that are the core of marketing theory and practice (Spreng and Mackoy, 1996). The key to sustainable competitive advantage lies in delivering high quality service that will result in satisfied customers (Shemwell et al., 1998, in Sureshchander et al., 2002). However, the two concepts are distinct (Zeithaml and Bitner, 2003) though obviously related (Saurina and Coenders, 2002). In terms of customer satisfaction, no agreed upon definition appears to exist (Giese and Cote, 2000). This definitional shortcoming is evidenced by the debate on whether satisfaction is a process or an outcome. However, it is generally agreed that customer satisfaction is a post-purchase phenomenon (Yi, 1990). In this study, the term customer will refer to the end-user of the product (ATMs). Customer satisfaction is defined as the customer's evaluation of a product or service in terms of whether that product or service meets that individual's needs or expectations. On the other hand, service quality focuses on an evaluation of how the customer perceives elements of the service. Parasuraman et al. (1985, 1988) define perceived quality as the gap between the consumer's expectations and the consumer's perception regarding the service. Many firms have discovered that increasing levels of customer satisfaction are linked to customer loyalty (Zeithaml and Bitner, 2003). The literature underscores the importance of quality perceptions and the relationship between service satisfaction and quality (Cronin and Taylor, 1994).

There is a difference between customer satisfaction as related to tangible products, and customer satisfaction as related to service experiences (Dimitriades, 2006). This is due to the inherent intangibility and perishability of services, as well as inability to separate production and consumption. Therefore, customer satisfaction with services and with goods may be influenced by different factors and should be treated as separate and distinct (Veloutsou et al., 2005). According to Bansal et al. (2004), customer satisfaction in an online environment may be driven by consumer benefits in using the self-service technology. Further in service quality research, there is need to clarify whether customer satisfaction is conceptualized as attribute specific, or overall (aggregate) and whether it is viewed as transaction specific (encounter satisfaction) or as cumulative (satisfaction overtime) (Hoest and Knie-Andersen, 2004). In this study, customer satisfaction is conceptualized as an overall customer attitude towards the service provider (Levesque and McDougall, 1996).

Measurement of e-service quality

Research on the measurement of e-service quality takes traditional service quality dimensions and web interface quality dimensions as the point of departure

(Li and Suomi, 2007). SERVQUAL (Zeithaml and Bitner, 2003), though mostly measuring traditional service quality, is suggested as a good starting point in this regard. Zeithaml (2002) and Parasuraman et al. (2005) postulate that some dimensions of SERVQUAL can be applied to e-service, but additional dimensions are present in e-service that are specifically related to technology. SERVQUAL has five dimensions, namely reliability, tangibles, responsiveness, empathy plus assurance (Buttle, 1996). While widely used, it has also been criticized because no consensus has emerged over a number of relevant issues (Saurina and Coenders, 2002). For example, some researchers have questioned its dimensionality while others have argued about its measurement of perceptions and expectations (Cronin and Taylor, 1994). Another pertinent question is whether SERVQUAL is applicable to any service. Further, the domains of this instrument may not be stable and consistent across cultures (Parasuraman et al., 1988). Barnes and Vidgen (2002) extend the SERVQUAL and establish a WebQual Index with 24 items measuring seven dimensions namely: reliability, compliance, responsiveness, access, credibility, communication and understanding the individual. Similarly, Madu and Madu (2002) propose 15 dimensions of online service quality: performance, features, structures, aesthetics, reliability, storage capacity, serviceability, security and system integrity, trust, responsiveness, product differentiation and utilization, web store policies, reputation, assurance and empathy. Gefen (2002) also attempted to extend SERVQUAL to the electronic context by collapsing the five dimensions into three, i.e. tangibles, empathy and a combination of the others into one dimension. In view of these criticisms, Parasuraman et al. (2005) developed the E-S-QUAL with four dimensions which they labeled efficiency, fulfillment, systems availability, and privacy. Other instruments that were developed in response to this debate are WEBQUAL (Loiacano et al., 2001) and SITEQUAL (Yoo and Donthu, 2001). Other studies have made an attempt to identify key dimensions of online businesses like online banking. Joseph et al. (1999) have identified six dimensions of online banking service quality, namely convenience/accuracy, feedback/complaint management, efficiency, queue management, accessibility and customization. The above narration shows in summary that there is no consensus on what drives online service quality and e satisfaction (Zeithaml, 2002).

Initial research on ATMs had focused on providing evidence of the association between consumer usage patterns and their demographic profiles as well as consumer psychographic profiles. However, the continued rejection of ATMs (Murdock and Franz, 1983) called for more research to establish how users and non-users perceive them and why. The contention is that perceptual variables are more successful as predictors of the purchase outcome than customers' personal characteristics (Ostlund in Rugimbana, 1995). Table I summarizes other research on ATM service quality evaluation criteria and shows the most important dimensions identified in each study.

Consensus has yet to emerge over e-service evaluation criteria since cultural differences affect the relative importance placed on the various dimensions.

Method
A triangulation technique was adapted for this study by using both qualitative and quantitative approaches (Campbell and Fiske, 1959). This approach was necessitated by the fact that established standardized research instruments may not be entirely appropriate in emerging markets as they are likely to miss important service attributes

Location	Accessibility	Reliability	Convenience	Ease of use	Control	Efficiency and speed	Flexibility or compatibility
Moutinho and Brownlie (1989) and Islam et al. (2008)	Leblanc (1990), Moutinho and Brownlie (1989), Greenland et al. (2006) and Joseph et al. (1999)	Howcroft (1991), Rugimbana (1995), Gummesson (1991) and Goode and Moutinho (1995)	Joseph and Stone (2003), Rugimbana (1995), Goode and Moutinho (1995) and Joseph et al. (1999)	Rugimbana (1995), Gummesson (1991), Greenland et al. (2006) and Islam et al. (2008)	Kangis and Passa (1997), Newman and Cowling (1996) and Bateson (1985)	Ledingham (1984), Greenland et al. (2006) and Joseph et al. (1999)	Rugimbana (1995) and Dabholker (1994)
Security	Charges	Privacy	Accuracy	Tangibles	Accuracy	ATM personnel/ queue mgt	Card
Greenland et al. (2006) and Islam et al. (2008)	Cantrell (1997)	Greenland et al. (2006)	Greenland et al. (2006)	Islam et al. (2008) and Greenland et al. (2006)	Parasuraman et al. (1988) and Joseph et al. (1999)	Islam et al. (2008) and Joseph et al. (1999)	Greenland et al. (2006) and Islam et al. (2008)

(Greenland et al., 2006). The research instrument was developed following Churchill's (1979) paradigm of developing marketing instruments.

Qualitative study

The process started with a rigorous review of the domain literature of e-service quality in order to determine its prominent dimensions and underlying items. This review was followed by an exploratory study involving third-year Bachelor of Business Administration (BBA) students at Uganda Christian University (n ¼ 102). During class time, the students were requested to write down what factors they considered important when evaluating ATM services of their personal bank. The same question (and procedure) was put to ten senior lecturers during an inter-university research conference. Discussions were also held with bankers and business people as well as an examination of local newspapers for any complaints or commendations regarding ATM services. This effort yielded a total of 65 original items. These items were put before a panel of three judges (a senior banker, a senior marketing lecturer and a senior research methodology lecturer) who scrutinized them for clarity in meaning, repetition, and relevancy to the concept of ATM service quality evaluation. This content/face validity examination resulted in the cancellation of 25 items, leaving a balance of 40.

Quantitative study

The 40 items were put in a draft questionnaire. A convenience (purposive) sample of first-year BBA students and staff was then requested to rate their bank's ATM services on a seven-point Likert scale anchored from "1 – strongly disagree" to "7 – strongly agree". Following Parasuraman et al. (1988), respondents were also asked to indicate their overall satisfaction with their bank's ATM services on a seven point scale ranging from "1 – not satisfied" to "7 – highly satisfied". Items in the questionnaire were randomly assigned to counter any systematic order effect. The instrument had been pre-tested using 20 students who found no difficulty in answering the questions. This pre-test allowed for refinement of the tool by eliminating any ambiguity.

This exercise yielded 117 questionnaires (105 students and 12 teaching and non-teaching staff) and these were subjected to a reliability analysis using SPSS. All items had a scores ranging from 0.8999 to 0.9091 and an overall a for the instrument of 0.8927. This result is well within the range recommended by Nunnally and Bernstein (1994), indicating the measure was robust. Thus, the questionnaire was administered to another 220 second-year BBA and Bachelor of Procurement and Logistics (BPLM) students. A total of 20 questionnaires with missing data were not useful thus leaving the total sample size at 317. Since the researcher intended to employ exploratory factor analysis, the sample had to conform to the recommendation of Hair et al. (1998), i.e. be six times as large as the number of items in the questionnaire (6 £ 40) so the minimum sample size had to be 240 respondents. The sample consisted mostly of students (98 percent) because young people are more likely to use ATMs than older people (Zeithaml and Gilly, 1987). The population ages ranged from 19 to 61 with a mean of 27 and mode of 25. They held ATM cards of eight different commercial banks and two microfinance institutions. The research population was evenly divided between males (50.2 percent) and females (49.8 percent).

Factor analysis was carried out by first constructing a Pearsonian correlation matrix between each pair of the 40 items. Bartlett's test of sphericity was done to test the null

hypothesis that the resultant 40 £ 40 correlation matrix was an identity matrix, all diagonal coefficients are equal to one, and off diagonal items are zero (those that are not zero are due to chance). The null hypothesis was rejected (x^2 ¼ 3282.511 df ¼ 780, p ¼ 0.000). The Kaiser Meyer-Olkin measure of sampling adequacy yielded a coefficient of 0.856 which is interpreted as meritorious (Kaiser, 1974). These two tests mean the items have adequate common variance and acceptable factorability (Tabachnick and Fidell, 1996). Principal axis extraction by promax rotation (k ¼ 4) with Kaiser Normalization revealed eight oblique latent factors each with eigenvalue greater than one because a useful factor must account for one unit of variance or have eigenvalue . 1 (Kaiser, 1974). The factors combined accounted for 48.2 percent of the variance. A practical criterion for determining the acceptability of a factor solution is that the solution should account for at least 50 percent of the total variance (Floyd and William, 1995 cited by Hassad, 2007). Oblique factors were preferred because they rotate to simple structure and also agree more with psychological theory than do orthogonal factors (Kline, 2000). The factors were named based on the factor pattern matrix (Hair *et al.*, 1998) after examining the underlying construct and its substantive meaning or what the items have in common. The pattern matrix was used (instead of the structure matrix) because its coefficients are standardized regression weights which reflect the relative and independent contribution of each item to the variance of the factor on which it loads (Russell, 2002 cited by Hassad, 2007). A pattern coefficient loading of . 0.5, i.e. explaining 25 percent of an items variance, was the cut off. Hair *et al.* (1998) also affirm that a measure is loaded significantly on its underlying construct if its factor loading exceeds 0.5, which is indicative of nomological validity. Table II presents the named factors.

The table also shows the average variance extracted[1] (AVE) of the different factors, which is defined as the average variance shared between a construct and its measures (Reinartz *et al.*, 2003). AVE can be used to assess the discriminant validity of latent factors. Discriminant validity is a measure of the extent to which latent factors are distinct, i.e. they should not correlate so highly as to seem to be measuring the same underlying dimension (Siekpe, 2005), and can be assessed by examining the factor correlation matrix and AVE. The square root of AVE should exceed the correlations in the rows and columns for adequate discriminant validity, which indicates that more variance is shared between the construct and its indicators than with other constructs (Fornell and Lacker in Siekpe, 2005) as in Table III. The square root of AVE is in bold in the diagonal.

Another approach to assessing discriminant validity is to examine the factor reliabilities and the inter-factor correlations. For adequate discriminant validity, the reliability coefficients should be greater than the correlation coefficients (Gerbing and Anderson, 1988 cited by Siekpe, 2005). The reliability coefficients (in Table II) are greater than all the inter-factor correlation coefficients in Table III. Table II further shows that only four factors had acceptable reliabilities (i.e. 0.7 and above) namely location, reliability, card and tangibles. Therefore, factors with a , 0.7 were excluded from subsequent analysis. Lastly, since the inter-correlation between pairs of the factors did not exceed 0.9, the problem of multicollinearity was ignored (Hair *et al.*, 1998 in Siekpe, 2005).

The items from the four factors with acceptable reliabilities were put into a new questionnaire and a third wave of data was collected from another set of 197 respondents comprised of third-year BPLM students to enable cross-validation of the model. Confirmatory factor analysis with LISREL 8.8 (Joreskog and Sorbom, 1989) was carried

Latent factor	Eigenvalue	Loading	AVE	p_{AVE}	a
Tangibles					
Display box is attractively designed	8.57	0.615	0.342	0.585	0.72
Appearance of ATM facilities is good		0.601			
ATM environment is clean and attractive		0.545			
Card					
It is easy to replace a lost card	1.94	0.756	0.407	0.638	0.73
It is easy to acquire a card		0.672			
Bank takes care of ATM-related problems promptly		0.555			
It is easy to regain a captured card		0.544			
Discipline					
There is customer discipline on ATM locations	1.64	0.644	0.319	0.566	0.6
Denominations offered are convenient		0.53			
Security provided at ATM locations is adequate		0.509			
Reliability					
ATM is reliable	1.63	0.682	0.42	0.653	0.7
ATM is accurate		0.639			
There is consistency in service delivery by ATM		0.638			
Affordability					
Cost per ATM transaction is affordable	1.49	0.697	0.43	0.657	0.63
Bank ATM charges per transaction are known		0.645			
Instructions					
I enjoy carrying out transactions at ATM	1.41	0.518	0.26	0.51	0.6
ATM instructions enable me to feel in control during transaction		0.502			
Ease of use					
Withdrawing of money from ATM is easy	1.29	0.528	0.266	0.515	0.52
ATM PIN number errors are minimal		0.502			
Location					
Location of ATM facilities is convenient	1.27	0.721	0.444	0.665	0.7
ATM net work is easily accessible		0.606			

Table II.
Latent factors and their loadings

	1	2	3	4	5	6	7	8
Tangible	0.585							
Card	0.401	0.638						
Discipline	0.557	0.503	0.566					
Reliability	0.486	0.419	0.543	0.653				
Affordability	0.336	0.293	0.372	0.388	0.657			
Instructions	0.428	0.333	0.335	0.333	0.305	0.51		
Ease of use	0.434	0.239	0.395	0.273	0.319	0.147	0.515	
Location	0.237	0.234	0.243	0.284	0.139	0.221	0.159	0.665

Table III.
Factor correlation matrix

out using raw data to draw a path diagram based on the maximum likelihood minimization function to fit the model. Marker variables were convenience, reliable, replace and attractive for each of the four latent factors of location, reliability, card, and tangibles. These latent factors were permitted to correlate based on evidence from the exploratory factor analysis. The model was identified with 29df. Model evaluation based on absolute fit, parsimony correction and comparative fit (Brown, 2006) shows

a x^2 (66.84), p ¼ 0.00. In spite of the significant x^2, RMSEA was 0.078 (90 percent CI ¼ 0.052-0.1; Cfit ¼ 0.035). Browne and Cudeck (1993) propose as a rule of thumb that RMSEA values , 0.08 show adequate model fit. CFI was 0.93, which is acceptable given that values in the range of 0.91-0.95 may be indicative of acceptable model fit (Bentler, 1990).The model also had a AGFI coefficient of 0.94. In all, this evaluation shows that the model adequately fits the data.

Regression

A hierarchical linear regression was carried out to determine the most important of these four dimensions. Factor analysis produces scores for each factor (in this study regression scores) which reflect the importance (or otherwise) of each factor to each respondent (Norusis, 1990). Thus, factor scores are the independent variables and the respondent's general level of satisfaction with the bank's ATM services is the dependent variable. The stepwise regression entered tangibles first because it was assumed to be the best predictor of overall satisfaction.

Result

The first predictor (tangibles) accounted for a significant amount of variance in overall satisfaction R^2 ¼ 0.163 F (1,315) ¼ 62.68 p ¼ 0.000. The second predictor (card) also accounted for a significant amount variance in overall satisfaction, DR^2 ¼ 0.037 F (2,314) ¼ 39.97 p ¼ 0.000. The third predictor (reliability) also accounted for a significant amount of variance in overall satisfaction DR^2 ¼ 0.012 F (3,313) ¼ 28.49 p , 0.032. The fourth predictor (location) did not account for a significant amount of variance in overall satisfaction, DR^2 ¼ 0.004 F (4,312) ¼ 21.83 p . 0.198. In all, the three predictors accounted for 20.9 percent of the variance in the criterion variable. Further no multicollinearity problem was observed since VIF was , 2.0 in all cases. The coefficients are presented in the Table IV.

Lastly, most of the respondents are only moderately satisfied with the ATM services of their banks (59 percent), only 20.8 percent were highly satisfied, while only 3.2 percent were very highly satisfied (Table V).

Table IV.
Regression coefficients

Model		Unstandardized coefficients		Standardized coefficients	
		b	SE	b	Sig
1	Constant	5.016	0.047		0.000
	Tangibles	0.404	0.051	0.407	0.000
2	Constant	5.016	0.046		
	Tangibles	0.236	0.067	0.238	0.000
	Card	0.262	0.069	0.256	0.000
3	Constant	5.016	0.046		
	Tangibles	0.209	0.067	0.211	0.002
	Card	0.22	0.071	0.216	0.002
	Reliability	0.136	0.063	0.124	0.032
4	Constant	5.016	0.046		
	Tangibles	0.197	0.068	0.198	0.004
	Card	0.215	0.071	0.211	0.003
	Reliability	0.14	0.063	0.128	0.027
	Location	–	0.063	0.066	0.198

Discussion

In this age of self-service technologies, bank managers need to understand what criteria are being used by customers to evaluate their services. This study contributes to the literature by identifying the major service evaluation criteria for ATMs by students in Uganda. An examination of the beta weights shows that in order of importance tangibles (p ¼ 0.00), card issues (p ¼ 0.00), and reliability (p ¼ 0.00) are the most important ATM evaluation criteria followed by location, affordability, ease of use, convenience, control, and discipline (Table I). Consistent with Zeithaml (2002), Parasuraman et al. (2005) and Greenland et al. (2006), this study confirms the difference in dimensionality between e-service quality and the more traditional service quality delivered by employees. The study also establishes that reliability is not the key driver of e-service quality as is the case with the traditional employee delivered services. However, while Greenland et al. (2006) found ease of use to be the key driver of ATM service quality evaluation, this study establishes tangibles to be the main key ATM service evaluation criterion. Greenland et al. (2006) and this study agree, however, that card issues and location (i.e. convenience) are important ATM service evaluation criteria. Hence, this study provides bank managers with a useful tool for gauging what criteria are most important from the customers' viewpoint. This knowledge can potentially enable managers to augment their products and bring service delivery level to a level that meets customer expectations (Joseph and Stone, 2003).

SERVQUAL (Zeithaml and Bitner, 2003) identifies tangibles as the fifth most important dimension in traditional employee centered service quality. This study identifies tangibles as the most important criterion in the evaluation of ATM services by students, i.e. the appearance of physical facilities, equipment, personnel and communication materials. The premises should be visually appealing (Saurina and Coenders, 2002), just as smart looking should be all personnel that deal with customers regarding ATM services. In fact many banks in Uganda have invested heavily in the physical facilities at the ATM locations. They have attached considerable importance to attractiveness, cleanliness and security of the premises.

Card issues, like obtaining a card, replacement of a card when lost or regaining a card if captured, are important evaluation criteria (Greenland et al., 2006; Islam et al., 2008). Earlier studies (Rugimbana, 1995) also identified the concern that customers have regarding ATM cards. In Uganda, some banks take as long as two weeks to issue an ATM card and an even longer period to replace a lost card as it involves deactivation as well as reporting the matter to the police. This process time needs to be significantly reduced.

Satisfaction	n	%
Very low satisfaction	2	0.63
Low satisfaction	5	1.57
Some what low satisfaction	12	3.78
Neither satisfied nor dissatisfied	34	10.70
Moderate satisfaction	188	59.30
High satisfaction	66	20.80
Very high satisfaction	10	3.15
Total	317	100

Table V.
Descriptive statistics
of overall satisfaction

Reliability as reflected in the proper technical functioning of the equipment (Zeithaml, 2002) is a critical factor identified in this study, but it also common in other studies (Rugimbana, 1995). In a much earlier study, Howcroft (1991) established that bank customers emphasized the breakdown of ATMs as an important source of service dissatisfaction. For example, the number of times a customer finds the ATM "out of service" and the time it takes to reopen the site are important reliability issues. It is disheartening to customers to find the ATM out of service, inconsistent in its operations, out of cash, or simply not dependable (Rugimbana, 1995).

Although the location (convenience) was not significant when included in the model, it remains an important factor. As Moutinho and Brownlie (1989) and Goode and Moutinho (1995) established in earlier studies, a high level of customer satisfaction is directly related to the location and accessibility of the ATMs. Location has implications for security, convenience, accessibility, and eventually usage of the technology (Joseph and Stone, 2003). Some banks in Uganda have put their ATM facilities in inconvenient locations. Others have put them in high risk security areas, and others do not provide privacy. In such cases, gender issues also come to the mind as women would feel susceptible to attacks in such locations.

A brief mention of other dimensions that were not considered for analysis is warranted. First, many studies indicated that ease of use is an important service evaluation criterion in ICT-based services (Gummesson, 1991; Rugimbana, 1995; Greenland et al., 2006), yet it was not considered important by the respondents in this study. In fact elsewhere perceived usefulness and ease of use are correlated significantly with self-reported and actual use of technology (Parasuraman et al., 2005). User friendly technology would encourage people to use electronic services, while complex technology is likely to deter them from attempting to adopt it as predicted by the TAM (Davis, 1989). This point is particularly important in emerging markets where literacy levels are comparatively low. Ease of use is critically related to control. Customers should feel as if they are in control of the technology and not vice versa (Kangis and Passa, 1997). This view is echoed by Bateson (1985) who argues that some element of control (follow instructions) is needed during the service encounter. Thus, the finding that ease of use was not significant is surprising and should be treated with caution. A possible explanation is that students are computer literate and can easily follow instructions without much difficulty. The findings would probably be different with another segment of bank customers.

Security is an important issue in Uganda given the spate of violence that engulfed the country in the past. Hence, banks give high priority to security concerns and customers have come to expect that security is always provided. Discipline and queue management as posited by Islam et al. (2008) is a particularly important service criterion in ATM banking. In Uganda few ATM outlets are available and most of these are usually congested at peak times. Yet this study did not find discipline to be a significant factor, which is surprising. There is need for a first come first served culture, operationalised by lining up and respecting others as well as permitting others to carry out their transactions privately and quietly. The culture of lining up is yet to take root in Uganda. Security personnel at ATM sites try to ensure discipline and the respondents may have taken it for granted that this is always the case.

Affordability of ATM services is a critical service factor as established by Cantrell (1997), although it did not emerge as a significant variable in this study. Affordability is important for people who make a number of transactions daily on ATMs.

Even in developed countries, the affordability of ATM services has been an issue (European Commission, 2005). The attempt by British banks to introduce disloyalty fees was strongly resisted in 2001, just as in the US case where anti-surcharge legislation was passed in many states (New Rules Project, 2001). As Goode et al. (1996) suggest, banks could move away from proprietary networks as a way of sharing the cost of installation and maintenance, thus providing greater accessibility and convenience. This culture is slowly taking shape in Uganda with a few banks sharing networks. To keep ATM and other bank tariffs affordable, the Bank of Uganda now requires financial institutions to display their tariff rates and regularly reprints them in the press following complaints from the public that institutions were levying exorbitant charges (Bank of Uganda, 2005). Financial institutions themselves should avoid giving the impression that ATM networks are expensive. Though this study did not find affordability to be significant, a possible explanation is that the current tariff levied by the banks is affordable in light of the steps taken by the central bank, and the competitive environment in which the banks are operating.

Many banks in Uganda are engaged in stiff competition for university students as exemplified by their sales promotion efforts on many university campuses, especially at the beginning of a new academic year. Goode and Moutinho (1995) established that marked differences exist in the way students and other customers view key antecedent variables leading to overall satisfaction from ATM services. Students use ATM services much more frequently than other customers. Hence, bank managers need to evaluate service quality criteria critically and use the resultant data in their decision-making process as suggested by Peters and Austin (1987) in Goode et al. (1996). This study provides a starting point in that direction. Most respondents are moderately satisfied with their bank's ATM services, thus managers still need to reevaluate these services.

Implications for practice

A number of implications for managerial practice can be found. First, this study provides an instrument that bank managers can use to monitor ATM service quality in Uganda. Second, bank managers should endeavor to design attractive ATM sites in line with their branding and positioning strategy. For instance, the premises ought to be kept clean and secure at all times. Third, bank managers ought to expedite the card issuance and replacement process. Fourth, managers ought to ensure that ATM breakdowns are kept at a minimum and that ATMs do not run out of cash. Service recovery measures ought to be efficient. Similarly, the management of ATM complaints should be effective. Fifth, banks ought to locate their ATM sites in secure and easy to reach places, improve accessibility (provide 24-hour service), as well as establish more service points where possible. Lastly, banks in Uganda should investigate the possibility of putting ATMs on university campuses as suggested by Goode and Moutinho (1995).

Implications for researchers

The study utilized a convenience sample of students. Given the current cutthroat competition in the banking industry, a similar study needs to be conducted to establish the service evaluation criteria of other bank customer segments, e.g. business people. In light of the findings of this study, researchers need to establish a number of issues relating to each of the identified evaluation criteria. For example, how best should banks design their ATM sites? To what extent would customers feel secure if they had

to draw money from an exposed ATM? Do all bank customers prefer to be served by self-service technologies or do some desire human interaction that can only be provided by individual bank personnel (Goode and Moutinho, 1995; Joseph and Stone, 2003)? What demographic factors influence perception of e-service quality? Does sex, age, or level of education, for example, affect the perception of service quality delivered by ATMs? There is need to do more research about the customers identity as suggested by Rugimbana (1995). To what extent do customers make full use of all the banking services available from ATMs? Lastly, future research should try to validate the instrument developed in this study in other emerging market contexts.

Conclusion

This study investigated student e-service evaluation criteria of ATMs by developing and validating a psychometrically sound instrument and then uses that same instrument to identify the e-service evaluation criteria. The study establishes that ATM student users consider tangibles, card issues, reliability and location, in that order, as important evaluation criteria of ATM services. Based on the moderate overall satisfaction with service score, which is consistent with findings by Goode and Moutinho (1995), banks in Uganda need to do much more in order to meet the ATM service expectations of their customers. The instrument used in this study should enable managers to bench mark performance and plan improvements.

Limitations of the study

The study utilized a convenience sample instead of a random sample, but this is common in many similar studies (Yoo and Donthu, 2001). Second, the study utilized a small sample composed mainly of students in only one academic institution. A lack of similar studies in Uganda may have limited the scope of the items for inclusion in the original instrument. In spite of these limitations, the findings of this study yield valuable insights into e-service quality evaluative criteria in emerging markets like Uganda, and provide a firm basis for future investigation and diagnosis of this field of study.

Note

1. Average variance extracted (AVE) is given by: AVE $= \frac{1}{4} \sum l_{i}^{2} / \{ \sum l_{i}^{2} + \sum \delta_{1 2 l i} \}$, where $\sum l_{i}^{2}$ is the sum of the squared loading, while $\sum \delta_{1 2 l i}$ is the sum of the residual variances (Reinartz et al., 2003).

References

Ahmad, S. (2002), "Service failures and customer defection: a closer look at online shopping expectations", Managing Service Quality, Vol. 12 No. 1, pp. 19-29.

Ajzen, I. and Fishbein, M. (1980), Understanding Attitudes and Predicting Social Behavior, Prentice-Hall, Englewood Cliffs, NJ.

Alstad, J. (2002), "Use your service edge to your online advantage", American Banker, Vol. 167 No. 46, pp. 1-3.

Anthes, G.H. (1998), "The bad news", Computer World, Vol. 10, August, pp. 53-5.

Bank of Uganda (2005), The annual supervisory and regulatory report, No. 1, available at: www.bou.or.ug/bouwebsite/opencms/bou/regulation_supervision/annual_supervision_report_old.html (accessed 24 February 2010).

Bansal, S.H., McDougall, H.G.G., Dikolli, S.S. and Sedatole, K.L. (2004), "Relating satisfaction to behavioral outcomes: an empirical study", Journal of Services Marketing, Vol. 18 No. 4, pp. 290-302.

Barnes, S.J. and Vidgen, R. (2002), "An evaluation of cyber-bookshops: the WebQual method", International Journal of Electronic Commerce, Vol. 6 No. 1, pp. 11-30.

Bateson, J. (1985), "Perceived control the service encounter", in Czepiel, J.A., Suprenant, C.F. and Solomon, M.R. (Eds), The Service Encounter: Managing Employee Customer Interaction in Service Businesses, Lexington Books, Lexington, MA.

Bentler, P.M. (1990), "Comparative fit indices in structural equation models", Psychological Bulletin, Vol. 107 No. 2, pp. 238-46.

Brown, T.A. (2006), Confirmatory Factor Analysis for Applied Research, Guildford, London.

Browne, M.W. and Cudeck, R. (1993), "Alternative ways of assessing model fit", in Bollen, K.A. and Long, J.S. (Eds), Testing Structural Equation Models, Sage, Newbury Park, CA, pp. 136-62.

Buckley, J. (2003), "E-service and the public sector", Managing Service Quality, Vol. 13 No. 6, pp. 453-62.

Buttle, F. (1996), "SERVQUAL: review, critique, research agenda", European Journal of Marketing, Vol. 30 No. 1, pp. 8-32.

Campbell, D.T. and Fiske, D.W. (1959), "Convergent and discriminant validation by the multitrait-multimethod matrix", Psychological Bulletin, Vol. 56 No. 2, pp. 81-105.

Cantrell, C. (1997), "Up close and profitable", Bank Marketing, Vol. 29 No. 6, pp. 45-6.

Churchill, G.A. Jr (1979), "A paradigm for developing better measures of marketing constructs", Journal of Marketing Research, Vol. 16 No. 1, pp. 64-73.

Cronin, J.J. and Taylor, S.A. (1994), "SERVPERF versus SERVQUAL: reconciling performance based and perceptions minus expectations measurement of service quality", Journal of Marketing, Vol. 58 No. 1, pp. 55-68.

Dabholker, P. (1994), "Technology based service delivery", Advances in Services Marketing and Management, Vol. 3, pp. 241-71.

Dabholker, P.A. (1996), "Consumer evaluations of new technology based self-service options: an investigation of alternative models of service quality", International Journal of Research in Marketing, Vol. 3 No. 1, pp. 29-51.

Davis, F.D. (1989), A Technology Acceptance Model for Empirically Testing New End User Information Systems: Theory and Results, MIT Sloan School of Management, Cambridge, MA.

Davis, F.D., Bagozzi, R.P. and Warshaw, P.R. (1989), "User acceptance of computer technology: a comparison of two theoretical models", Management Science, Vol. 35 No. 8, pp. 982-1003.

Dimitriades, Z.S. (2006), "Customer satisfaction, loyalty and commitment in service organisations: some evidence from Greece", Management Research News, Vol. 29 No. 12, pp. 782-800.

European Commission (2005), "Study of the impact of regulation 2560/2001 on the bank charges for national payments", Final Report Project No.MARKT/2004/11F-Lot 2.

Gefen, D. (2002), "Customer loyalty in e-commerce", Journal of the Association for Information Systems, Vol. 3, July, pp. 27-51.

Giese, J.L. and Cote, J.A. (2000), "Defining consumer satisfaction", Academy of Marketing Science Review, Vol. 2000 No. 1, pp. 1-27.

Goode, M.M.H. and Moutinho, L.A. (1995), "The effects of free banking on overall satisfaction: the use of automated teller machines", International Journal of Bank Marketing, Vol. 13 No. 4, pp. 33-40.

Goode, M.M.H., Moutinho, L.A. and Chien, C. (1996), "Structural equation modeling of overall satisfaction and full use of services for ATMs", International Journal of Bank Marketing, Vol. 14 No. 7, pp. 4-11.

Greenland, S., Coshall, J. and Combe, I. (2006), "Evaluating service quality and customer satisfaction in emerging markets", International Journal of Consumer Studies, Vol. 30 No. 6, pp. 582-90.

Gummesson, E. (1991), "Truth and myths in services quality", International Journal of Service Industry Management, Vol. 2 No. 3, pp. 7-16.

Hair, J.F., Ralph, E.A., Ronald, L.T. and William, C.B. (1998), Multivariate Data Analysis, 5th ed., Prentice-Hall, Upper Saddle River, NJ.

Hall, R. (1998), "Alternative delivery equals less need for frontline competence", Bank Marketing, Vol. 30 No. 6, p. 42.

Hassad, A.R. (2007), "Developing and validation of a scale for measuring instructors' attitudes toward concept based or reform: oriented teaching of introductory statistics in the health and behavioral sciences", unpublished thesis, Touro University International (TUI), Alameda, CA.

Howcroft, J.B. (1991), "Customer service in selected branches of a U.K. clearing bank: a pilot study: the service-manufacturing divide: synergies and dilemmas", Proceedings of the Service Industries Management Research Unit Conference, Cardiff Business School, University of Wales, College of Cardiff, September 25-26, pp. 25-6.

Hoest, V. and Knie-Andersen, M. (2004), "Modeling customer satisfaction in mortgage credit companies", The International Journal of Bank Marketing, Vol. 22 No. 1, pp. 26-42.

Hsu, M.H., Chiu, C.M. and Ju, L.T. (2004), "Determinants of continued use of the www: an integration of two theoretical models", Industrial Management & Data Systems, Vol. 104 No. 8, pp. 766-75.

Islam, R., Kumar, S. and Biswas, P.K. (2008), "Customer satisfaction of ATM service: a case study of HSBC ATM", available at: http://ssrn.com/abstract¼990242 (accessed 24 February 2010).

Joreskog, K.G. and Sorbom, D. (1989), LISREL 8.8, Student edition, Scientific Software International, Lincoln, NB.

Joseph, M. and Stone, G. (2003), "An empirical evaluation of US bank customer perceptions of the impact of technology on service delivery in the banking sector", International Journal of Retail & Distribution Management, Vol. 31 No. 4, pp. 190-202.

Joseph, M., Mclure, C. and Joseph, B. (1999), "Service quality in the banking sector: the impact of technology in service delivery", International Journal of Bank Marketing, Vol. 17 No. 4, pp. 182-91.

Kaiser, H.F. (1974), "An index of factorial simplicity", Psychometrika, Vol. 39 No. 1, pp. 31-6.

Kangis, P. and Passa, V. (1997), "Awareness of service charges and its influence on customer expectations and perceptions of quality banking", Journal of Services Marketing, Vol. 11 No. 2, pp. 105-17.

Kline, P. (2000), Handbook of Psychological Testing, 2nd ed., Routledge, London.

Leblanc, G. (1990), "Customer motivation: use and non-use of automated banking", International Journal of Bank Marketing, Vol. 8 No. 4, pp. 36-40.

Ledingham, J. (1984), "Are consumers ready for the information age?", Journal of Advertising Research, Vol. 24 No. 4, pp. 31-7.

Levesque, T. and McDougall, G. (1996), "Determinants of customer satisfaction in retail banking", International Journal of Bank Marketing, Vol. 14 No. 7, pp. 12-20.

Li, H. and Suomi, R. (2007), "Evaluating electronic service quality: a transaction process based evaluation model", in Remenyi, D. (Ed.), Proceedings of the European Conference on Information Management and Evaluation (ECIME), Montpellier, France, 20-21 September, pp. 331-40.

Loiacano, E., Watson, R.T. and Goodhue, G. (2001), "WebQual: a web site quality instrument", working paper, Worchester Polytechnic Institute, Worchester, MA.

Loudon, D.L. and Della Bitta, A.J. (1988), Consumer Behavior: Concepts and Applications, McGraw-Hill, Singapore.

Madu, C.N. and Madu, A.A. (2002), "Dimensions of e-quality", International Journal of Quality & Reliability Management, Vol. 19 No. 3, pp. 246-58.

Moutinho, L. and Brownlie, D.T. (1989), "Customer satisfaction with bank services: a multidimensional space analysis", International Journal of Bank Marketing, Vol. 7 No. 5, pp. 23-7.

Murdock, G. and Franz, L. (1983), "Habit and perceived risk as factors in the resistance to the use of ATMs", Journal of Retail Banking, Vol. 5 No. 2, pp. 20-9.

Newman, K. and Cowling, A. (1996), "Service quality in retail banking: the experience of two British clearing banks", International Journal of Bank Management, Vol. 14 No. 6, pp. 3-11.

New Rules Project (2001), "ATM surcharge bans", available at: www.newrules.org/banking/ rules/atm-surcharge-bans (assessed 24 February 2010).

Norusis, M.J. (1990), SPSS–X Advanced Statistics Guide, 2nd ed., Statistical Package for the Social Sciences, Chicago, IL.

Nunnally, J.C. and Bernstein, I.H. (1994), Psychometric Theory, McGraw-Hill, New York, NY.

Oliver, R.L. (1980), "A cognitive model of the antecedents and consequences of satisfaction decisions", Journal of Marketing Research, Vol. 17 No. 4, pp. 460-70.

Parasuraman, A., Zeithaml, V.A. and Berry, L. (1985), "A conceptual model of service quality and its implications for future research", Journal of Marketing, Vol. 49 No. 4, pp. 41-50.

Parasuraman, A., Zeithaml, V.A. and Berry, L.L. (1988), "SERVQUAL: a multiple-item scale for measuring consumer perceptions of service quality", Journal of Retailing, Vol. 64 No. 1, pp. 12-40.

Parasuraman, A., Zeithaml, V.A. and Malhotra, A. (2005), "E-S-QUAL: a multiple-item scale for assessing electronic service quality", Journal of Service Research, Vol. 7 No. 3, pp. 213-33.

Reichheld, F.F. and Sasser, W.E. Jr (1990), "Zero defections: quality comes to services", Harvard Business Review, Vol. 78 No. 4, pp. 105-11.

Reinartz, W., Kraft, M. and Hoyer, W. (2003), "Measuring the customer relationship construct and linking its performance outcome", INSEAD Working Paper Series 2003/02/MKT.

Rubino, G. (2000), "Getting and keeping online customers: if you build it, will they come?", Bank Marketing, Vol. 32 No. 3, pp. 36-40.

Rugimbana, R. (1995), "Predicting automated teller machine usage", International Journal of Bank Marketing, Vol. 13 No. 4, pp. 26-32.

Santos, J. (2003), "E-service quality: a model of virtual service quality dimensions", Managing Service Quality, Vol. 14 No. 6, pp. 446-56.

Saurina, C. and Coenders, G. (2002), "Predicting overall service quality: a structural equation modeling approach", in Ferligoj, A. and Mrvar, A. (Eds), Development in Social Science Methodology, Metodoloski Zvezki, Vol. 18, FDV, Ljubljana, pp. 217-18.

Shemwell, D.J., Yavas, U. and Bilgin, Z. (1998), "Customer-service provider relationships: an empirical test of a model of service quality, satisfaction and relationship oriented outcome", International Journal of Service Industry Management, Vol. 9 No. 2, pp. 155-68.

Siekpe, S.J. (2005), "An examination of the multidimensionality of the flow construct in a computer-mediated environment", Journal of Electronic Commerce Research, Vol. 6 No. 1, pp. 31-43.

Spreng, R.A. and Mackoy, R.D. (1996), "An empirical examination of a model of perceived service quality and satisfaction", Journal of Retailing, Vol. 72 No. 2, pp. 201-14.

Spreng, R.A. and Page, J.T. (2003), "A test of alternative measures of disconfirmation", Decision Sciences, Vol. 34 No. 1, pp. 31-63.

Sureshchander, G.S., Rajendran, C. and Anantharaman, R.N. (2002), "The relationship between service quality and customer satisfaction: a factor specific approach", Journal of Services Marketing, Vol. 16 No. 4, pp. 363-79.

Tabachnick, B.G. and Fidell, L.S. (1996), Using Multivariate Statistics, 3rd ed., Harper Collins, New York, NY.

Veloutsou, C., Gilbert, R.G., Moutinho, L.A. and Good, M.M. (2005), "Measuring transaction specific satisfaction in services", European Journal of Marketing, Vol. 39 Nos 5/6, pp. 606-28.

Venkatesh, V. (2005), "Technology acceptance: unified model", in Davis, G.B. (Ed.), The Blackwell Encyclopedia of Management, Management Information Systems, Vol. 7, Malden, Oxford, pp. 329-31.

Yi, Y. (1990), "A critical review of consumer satisfaction", in Zeithaml, V.A. (Ed.), Review of Marketing, American Marketing Association, Chicago, IL, pp. 68-123.

Yoo, B. and Donthu, N. (2001), "Developing a scale to measure the perceived quality of an Internet shopping site (SiteQual)", Quarterly Journal of Electronic Commerce, Vol. 2 No. 1, pp. 31-46.

Zeithaml, V.A. (2002), "Service excellence in electronic channels", Managing Service Quality, Vol. 12 No. 3, pp. 135-9.

Zeithaml, V.A. and Bitner, M.J. (2003), Services Marketing: Integrating Customer Focus across the Firm, McGraw-Hill/Irwin, Boston, MA.

Zeithaml, V.A. and Gilly, M.C. (1987), "Characteristics affecting the acceptance of retailing technologies: a comparison of elderly and non-elderly consumers", Journal of Retailing, Vol. 63 No. 1, pp. 49-68.

Zhu, F.X., Wymer, W. and Chen, I. (2002), "IT-based services and service quality in consumer banking", International Journal Service Industry, Vol. 13 No. 1, pp. 69-91.

Further reading

Gaudin, S. (2003), "Companies failing at online customer service", available at: www.internetnews.com/stats/article.php/1588171/StudyþCompaniesþFailingþatþOnline þCustomerþService.htm

Oliver, R.L. (1981), "Measurement and evaluation of satisfaction processing in retail settings", Journal of Retailing, Vol. 57 No. 3, pp. 25-48.

Ostlund, L.E. (1974), "Perceived innovation attributes as predictors of innovativeness", Journal of Consumer Research, Vol. 1 No. 2, pp. 23-9.

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