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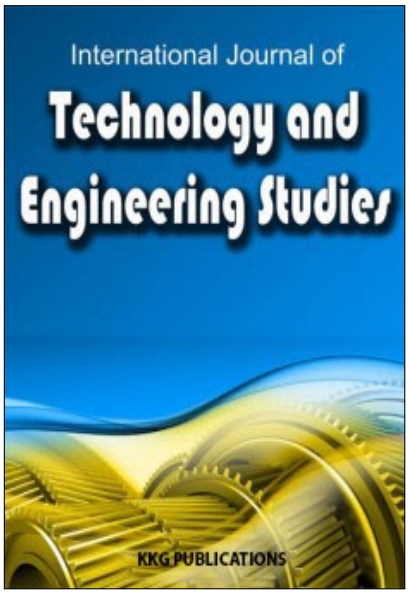

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A USABILITY EVALUATION OF MOBILE BANKING APPLICATIONS IN NIGERIA

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Abstract. The objective of this study is to identify the usability issues and the level of differences among the m-banking users on age, gender, qualification, and experience. This study employed a quantitative approach, and data is gathered through an online questionnaire from a total number of one hundred and fifty (150) respondents. The finding of this study indicates that all three banks have usability issues on privacy and reliability of them-banking application interface. This study also reveals that male users have fewer usability issues than females. The younger and the middle-aged also have fewer usability issues than the old aged. For the qualification of the users with lower qualifications, they have more usability issues than those with higher qualifications. While in years of experience using the mobile, the result shows that there are not many usability issues for the whole category of years. This study implies that it is important for the future development of the m-banking application interface to consider older-aged users and those with lower knowledge backgrounds and less experience in m-banking applications.

INTRODUCTION

Mobile banking (M-banking) is a part of mobile commerce or m-commerce services that allows the customers or users to perform many banking transactions such as check balance and transfer of fund through the use of mobile phones [1]. Similarly m-banking can be defined as transactions and services that are carried out by users or customers at their own convenience anywhere through the use of mobile phones especially smartphones [2].

Today, the rapid growth and widespread use of information technology is touching every part of human life; therefore, organizations such as financial institutions introduced the use of Internet technology to satisfy their customers' needs and improve their services. The most popular one among the Internet services is m-banking application [3].

Research on the field of usability evaluation of m-banking application interface has become a new area of research which faces limited methodologies to address issues associated to usability of such application [4]. Furthermore, there are high demands to form a proper usability evaluation framework that will evaluate the usability of mobile devices and application interfaces [5].

Therefore, there are less studies on the usability evaluation of mobile banking application associated to age, gender, qualification and experience, because most of the studies are conducted on the adoption of m-banking applications. The success of m-banking application in Nigeria remains an issue for the customers when performing transactions using m-banking application. The main objective of this study is to identify the general usability issues of m-banking application interface among the several Nigerian banks, and also to identify the usability issues and the level of differences among the m-banking users on age, gender, qualification and experience.

The next section provides a brief review of related literature. Section III describes the relevant methodology. Section IV presents the results of the data analysis followed by conclusion and future work.

RELATED STUDIES

The problems of usability issues such as login navigation, interface structure, mobile device compatibility, screen size and privacy are the major issues. Many researches mention that there is problem among the m-banking users on age, gender and qualification as mentioned by [6], [7], [8], [9], [14].

Usability evaluation is an issue that can be found on any kind of groups of people either on age group, gender, qualification or experience and any of these groups can have their own usability problems when interacting with either computers or mobile phones. In a research conducted by [11], they described that mobile phone application provides many supports to differ-

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ent age group users but the use of mobile interface between the middle age and adult age is becoming an issue to some of them especially the adult age.

They conducted a detailed experiment on the different age groups and they found that the adult age of fifty 50 years and above has problem in operating or performing the interface and also those with mobile phone experience a better than those without experience in operating the mobile application interface.

Similarly, another research shows that older age found it difficult to operate the computer system or other electronic devices because their performance during the use of devices' interface was very poor in terms of usability issues compared to younger people [10]. Their research also mentioned that older aged took longer time and performed many errors in operating the computer, but also mentioned more usability problems occur during the use of mobile phones.

Similarly, the research also mentioned another problem of usability issues of mobile phone interface among the different groups of people such as qualification and experience [10].

In another study on age differences in usability issues conducted by [8] mentioned that age differences play a vital role in usability issues in Personal Digital Assistants (PDA) as older aged user required longer time to complete a task and committed more errors while performing a task compared to younger aged user.

Similarly, other research also found that older aged user between sixty and above experienced more difficultly to use mobile phones compared to younger aged user and also male users are sharper than the female users [7]. Also another research on use of mobile phones by elderly people revealed that older people always have problems of usability when using mobile phones due to small screen size and button characters compared to younger aged users [12]. Similarly, another study on the usability issues of touchscreen mobile devices found that the younger aged users find it easier to operate smartphones and have more experience compared to old aged users when performing a task using the smartphones [13].

METHOD AND MATERIALS

This study employed the use of quantitative approach, in this study random sampling approach was used with a total number of one hundred and fifty (150) respondents using online questionnaire and facebook and email were used to identify the respondents. This study employed the use of questionnaire for measuring user interface satisfaction as designed by [1]. The questionnaire contained six sections, section A (Respondent's profile), section B (Mobile device compatibility), section C (Learning ability), section D (Interface structure and layout), section E (Task structure and presentation), section F (Privacy and reliability) and section G (Overall user impression about the application). Therefore, this study used three banks as a case study namely: Gtbank, Diamon and Skye bank users in Nigeria, irrespective of gender, age, qualification and experience. Among the respondents one hundred and nineteen (119) were male and thirty one (31) were female.

RESULTS AND DISCUSSION

This study collected data from different categories, such as gender, age, qualification and experience. The SPSS was used to run the collected data using descriptive statistics, independent sampling t-test and Analysis of Variance (ANOVA) to find out the significant difference among the age, gender, qualification and experience in order to identify the usability issues of m-banking application. Furthermore, the results of the analysis will be used to determine the significant differences if exist between the participants based on the defined categories: gender, age, qualification and experience.

The Table 1 below shows the analysis of data using descriptive statistics for finding the mean of each bank and compared the result to find out the significant differences between them in terms of usability issues in m-banking application interface.

TABLE 1
GENERAL USABILITY ISSUES IN NIGERIAN BANKS

Mobile banking	Number of Participants	Mean	Std. Deviation
Gtbank apps	77	6.7994	1.41333
Sykbank apps	41	6.5736	1.02556
Diamonbank apps	32	6.3276	1.01085

Table 1 above shows that the three banks have usability problems but Diamon bank has more usability issues than the others by looking at its mean score of 6.3276 followed by Sykbank with 6.5736 and Gtbank with fewer problems. But Table 2 shows the level of significance of each subjective metrics for the three banks.

TABLE 2
LEVEL OF SIGNIFICANCE AMONG THE BANKS

		Sum of squares	Df	Mean square	F	Sig.
Task Structure and Presentation	Between Groups	4.636	2	2.318	1.489	.229
	Within Groups	228.859	147	1.557		
Learning Ability	Between Groups	2.087	2	1.044	.462	.631
	Within Groups	332.376	147	2.261		
Interface Structure and Layout	Between Groups	4.444	2	2.222	1.354	.261
	Within Groups	241.223	147	1.641		
Mobile Device Compatibility	Between Groups	2.650	2	1.325	.777	.462
	Within Groups	250.598	147	1.705	250.598	
Privacy Reliability	Between Groups	27.098	2	13.549	7.484	.001
	Within Groups	266.119	147	1.810	266.119	

The table 2 shows the collective level of significance based on the mean of each group of questions from the subjective metrics for the three banks since Table 1 already shows the mean differences in usability issues between them. Therefore, Table 2 will explain the main usability issues. The mean score of task structure and presentation significance is (.229) which indicates not significant because (p >.005). The mean score of learning ability significance is (.631) which is also not significant and indicates that there is less problem compared to task structure and presentation. The mean score of interface structure and layout significance level is (.261) which is also not significant. The mean score of mobile device compatibility significance level is (.462) which is also not significant while the mean score of privacy reliability is significant at (.001) and this shows that users from these three banks have more usability problems on the privacy and reliability as shown in the Table 1 above.

TABLE 3
INDEPENDENT SAMPLE t-TEST GROUP STATISTICS

	Gender	Number of participants	Mean	Std. Deviation
Usability issues	Male	119	6.5137	1.23516
	Female	31	6.1534	.77231

TABLE 4
INDEPENDENT SAMPLES TEST

	Levene's Test for Equality of Variances		t-test for Equality of Means		
Usability issues	F	Sig.	t	Df	Sig. (2-tailed)
Equal variances assumed	5.561	.020	1.545	148	.124
Equal variances not assumed			2.012	74.849	.048

An independent sample t-test was conducted to compare the usability issues of mean score for male and female users of m-banking application. The Table 3 above shows that there was a significant difference in mean score between the male (M = 6.5137, SD = 1.23516) and female (M = 6.1534, SD = .86292, t (148) = 1.545, p = .124, two-tailed). While the Table 4 shows that the Levene's test for equality of variance was not statistically significant (t = 1.545, df = 148, p >0.05).

TABLE 5
USABILITY ISSUES ON AGE USING ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	4.805	3	1.602	1.191	.315
Within Groups	196.304	146	1.345		
Total	201.109	149			

TABLE 6
DESCRIPTIVE OF AGE GROUP USING ANOVA

Age group	No. Participants	Mean	Std. Deviation
20 30	24	6.2928	1.21956
31 40	78	6.5114	1.27239
41 50	40	6.5209	.86774
51 and above	8	5.7669	1.07362
Total	150		

Table 5 and 6 above show the one way between groups analysis of variance (anova) result which was conducted to explore the impact of age groups on the use of m-banking application. The participants were divided into four groups according to their age (Group 1: 20-30 years; Groups 2: 31 to 40 years; Group 3: 41 to 50 years; Group 4: 51 years and above). There was no statistically significant difference at the $p > .05$ level in usability score for the four age groups: F (3, 146) = 1.191, p = .315. Despite that there was no statistically significant difference, the actual differences in mean scores between the groups were quite different from each other. Post-hoc comparisons using the Tukey HSD test indicated that mean score for Group 1 (M = 6.293, SD = 1.2196) was significantly different from Group 4 (M =5.7669, SD = 1.074) Group 2 (M = 6.5114, SD = 1.2724) did not significantly differ from Group 3 (M = 6.5209, SD = .86774). This result shows that older age have more usability issues on m-banking application than the middle and younger aged user.

TABLE 7
ANOVA SIGNIFICANCE BETWEEN QUALIFICATION GROUPS

Groups	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	12.932	4	3.233	2.491	.046
Within Groups	188.177	145	1.298		
Total	201.109	149			

Table 7 and 8 above show the one way between groups analysis of variance (ANOVA) result which was conducted to explore the impact of qualification groups on the use of m-banking application. The participants were divided into five groups based on their levels of qualification (Group 1: Secondary school; Groups 2: Diploma; Group 3: First Degree; Group 4: Masters; Group 5: Ph.D.). The result shows that there was no statistically significant difference at the $p > .05$ level on usability score for the five qualification groups: F (4, 145) = 2.491, p =.046. Despite that, there is statistically significant difference, the actual differences in mean scores between the groups were quite different from each other. Post-hoc comparisons using the Tukey HSD test indicated that mean score for Group 1 (M = 4.7297) was significantly different from Group 5 (M = 6.8919, SD = 1.32889), Group 2 (M =5.2658, SD = .72469) was significantly different from Group 3 (M = 6.4432, SD = 1.13410) and Group 4 (M = 6.5291, SD = 1.15550) did not differ significantly from either Group 3 or 5. This result shows that users with higher qualification have few usability issues despite that they are old aged, but there qualifications really help them to overcome some usability issues while for those with lower qualification have more usability issues despite that they are young aged.

TABLE 8
DESCRIPTIVE MEAN DIFFERENCES FOR EACH QUALIFICATION GROUP

Qualification	No. Participants	Mean	Std. Deviation
Secondary School	1	4.7297	
Diploma	6	5.2658	.72469
First Degree	73	6.4432	1.13410
Masters	64	6.5291	1.15550
PhD	6	6.8919	1.32889
Total	150		

TABLE 9
ANOVA SIGNIFICANCE BETWEEN GROUPS BASED ON YEARS OF EXPERIENCE

Groups	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	12.186	4	3.046	2.338	.058
Within Groups	188.923	145	1.303		
Total	201.109	149			

TABLE 10
DESCRIPTIVE BY YEARS OF EXPERIENCE GROUPS

Years of experience	No. Participants	Mean	Std. Deviation
1 2	32	5.9814	1.58434
3 4	55	6.4010	.98540
5 6	33	6.7748	.81650
7 8	18	6.7447	.81905
9 and above	12	6.4550	1.53555
Total	150		

In Table 9 and 10 above show the one way between groups Analysis of Variance (ANOVA) result which was conducted to explore the impact of years of experience groups on the use of m-banking application. The participants were divided into five groups based on their years of experience (Group 1: 1 to 2 years; Groups 2: 3 to 4 years; Group 3: 5 to 6 years; Group 4: 7 to 8 years; Group 5: 9 years and above). The result also shows there was no statistically significant difference at the $p > .05$ level in usability score for the five qualification groups: F (4, 145) = 2.338, p = .058. Despite that there was no statistically significant difference, but the actual differences in mean scores between the groups were quite different from each other. . Post-hoc comparisons using the Tukey HSD test indicated that mean score for Group 1 (M = 5.9814, SD = 1.58434) was significantly different from Group 3 (M = 6.7748, SD = .81650) and Group 4 (M = 6.7447, SD = .81905) but Group 2 (M = 6.4010, SD = .98540) did not differ significantly from Group 5 (M = 6.4550, SD = 1.53555).

Discussion

The findings of this study show that all the three banks have more usability issues on privacy and reliability because the level of significance is .001 which indicates that 99% of the three banks have issues of privacy while the learning ability, interface structure and layout, task structure and presentation and mobile device compatibility are all not significant as shows in table 5. But the usability issues on age, gender, qualification and years of experience show that there are differences between them though for some of them the difference is not much when comparing with the mean values. For the gender the result shows that male users perform better and have less usability issues than the female users. For the age group also shows that younger and middle aged users have few usability issues than the older aged as mentioned by [21], [13].

This finding also shows that users with higher qualification have fewer usability issues despite that they are older in age but their qualifications really help them to overcome

some of the usability issues while those with lower qualifications have more usability issues despite that they are young aged [12]. For the years of experience the result shows that users with fewer years of experience have more usability issues followed by those with highest years of experience though they have the maximum years of experience but they are also old aged, but those with average years of experience have few usability issues because they are middle and young aged. The result also shows that users with higher qualification have fewer usability issues despite that they are old aged but their qualifications really help them to overcome some usability issues while those with lower qualifications have more usability issues despite that they are young aged.

CONCLUSION AND RECOMMENDATIONS

M-banking application interface becomes one of the most growing emergent m-commerce applications today that allows the users to perform transactions easily and is convenient without any difficulties. This study investigated the usability issues of several Nigerian banks and compared the mean differences between different age groups, genders, qualifications and experience in terms of usability issues of m-banking during transactions. The result of this study shows that it is important for the future development of m-banking application interface to consider older aged users and also those with lower knowledge background and also the users with less experience in m-banking application. Improving the m-banking application interface is to allow users with different age groups, genders, qualifications and experience to use the application easily because today many users are performing their transactions using m-banking application.

In addition, further study can focus on the security aspect of m-banking application and the various types of mobile devices since users perform these transactions using different mobile devices so that they avoid any incompatibility issues in using m-banking application.

Declaration of Conflicting Interests

No competing interests are present in the current study.

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— This article does not have any appendix. —