

Post Implementation Review: Users Perception of IUO Online Portal System

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Abstract: This research combines both computer and statistical knowledge in performing a post implementation review of users perception to the usability of IUO (Igbinedion University Okada) online portal system based on the four usability factors (compatibility and helpfulness, subjective satisfaction, efficiency and accuracy and learnability) earlier identified by Omorogiuwa and Chiemeké. The 50 items online questionnaire designed by human factor resource group was adopted to gather information about the usability of IUO online portal system. The respondents were mainly students of IUO, who are the major users of the online portal system for course registration, checking of results, admission clearance etc. The data was gathered between January to June 2007. A further detailed analysis of the various users perception of these factors revealed that there are differences in perceptions among and between the users of IUO online portal system and even where there are differences, are such differences statistically significant? Analysis of Variance (ANOVA) and post hoc test tools in SPSS 14 were used in carrying out further analysis. Among the 4 factors used for the post implementation review, ANOVA test shows that students perception is only significantly different to the subjective satisfaction factor. The post hoc test revealed a significant difference in the perception of students to the subjective satisfaction of IUO online portal system only between students in health science and social science/business management science.

Key words: IOU, post implementation, ANOVA, SPSS, post software usability test

INTRODUCTION

Software usability testing is very essential in software development and design. We will categorize software usability testing as pre-software usability testing and post-software usability testing. Pre-software usability testing entails the software developers carrying out specific test on the intending software product by the intending users. This test enables the designer to approximate the users initial experience of using a product without assistance. It also, employs real users conducting real tasks in a simulated environment similar to ideal implementation of the software. Post-software usability test entails carrying out test on software products that is already in use by the users. Post-software usability test is essential for enhanced software development. Post-software usability test results are very essential for software developers for reuse. However, to fully appreciate the usefulness of software usability test, it is essential to carry out, both pre-software usability and post-software usability tests on any particular software

product. While, pre-software usability test can be done before finally developing the software product, post-software usability test should always be a continuous activity in the usage of particular software product. Furthermore, post-software usability test consist of various dimension of usability testing such as testing the users subjective satisfaction level of the software product, testing individual level of usability of a product, comparing different users usability level of a software as it relates to its efficiency, learnability, operability, user-friendliness etc. All these are aimed at developing a more enhanced version of any software product under review.

In universities worldwide, the portal technology has increasingly become the default interface for non-academic staff, students and academic staff to interact digitally with each other. Many useful services, such as students and staff directories, management information, academic records and document sharing are readily available for access by portals and as a result, universities are investing heavily in this young and evolving technology.

The Igbinedion University, Okada (IUO) is not left out in this quest. This university is a culmination of the dream of Chief (Sir) Dr. Gabriel Osawaru Igbinedion, J.P., the Esama of Benin Kingdom, to bequeath to the future generations of Nigerians, quality university education of international standard. The foundation of the University was laid on 13th March 1995 with the inauguration of a planning committee comprising distinguished scholars and seasoned University administrators whose responsibilities amongst others included the formulation of the Academic Brief for the actualization of the Igbinedion University project. Towards the strife to meet the growing information technology needs of the University, its online portal system was developed by socket works Ltd in 2004. Since, its development and usage, IUO Online Portal System has attracted a lot of shortcomings from students who seem to be the major users. This could be as a result of the fact that too often, developers wait until the end of a portal project to address key interface and process concerns and even then, they rarely pay sufficient attention to usability considerations. Recall that the usability of an interface is a measure of the effectiveness, efficiency and satisfaction with which specified users can achieve specific goals in a particular environment with that interface (ISO). Unfortunately, the experience of using a portal often becomes excruciating for students, owing to considerable usability shortcomings. Such short comings range from portal in-accessibility, difficulties in filling registration forms (unfriendliness), difficulties in correcting errors etc. It should be noted that these shortcomings varies from students in the various colleges and departments since, not all the students have equal level of computer and internet usage.

However, to tackle these in-adequacies, the need to have a post-implementation review cannot be overemphasized since subjective satisfaction or user acceptance of a system is considered as a critical measure of a system or tool's success (Chin *et al.*, 1988). Also, the measures of satisfaction usually relate to specific features of a system and describe the perceived usability of the system by its users (Bevan and Macleod, 1994).

This research work aim at performing a post implementation review on users perception to the factors affecting the usability of IUO Online Portal System using ANOVA and Post Hoc test tools in Statistical Packages for Social Sciences (SPSS). To this end, the objective shall be to determine whether there are significant differences among users perception to the factors affecting the usability of Igbinedion University Online Portal System.

Literature review: Not much research have being done in Post Implementation review of the usability of universities online portal systems, however, there have been constructive efforts in researching into the usability of software products. Frokjaer *et al.* (2000) in measuring usability determined if there is correlation in usability factors such as efficiency, effectiveness and satisfaction. Nielsen and Philips (1993) estimated the relative usability of 2 interfaces: heuristic, formal and empirical methods compared. According to Nielsen and Philips (1993), an artifact is fruitful if is both useful and usable.

Lister (2001) designed usability testing software for the assessment of the internet usage. Sillius and Tervakari (2003) propose the attributes for an elearning system utility: value added: organization of teaching process, development of quality of teaching, development of learners skills, testing and development of educational ICT. Pedagogical usability: Support for organization of the teaching and studying, support for learning and tutoring processes as well as achievement of learning objectives and support for the development of learning skills (interaction with other actors, growth of learners autonomy and selfdirection). Omorogiuwa and Chiemeké (2008) identified the critical factors affecting the usability of Igbinedion University online portal system. Results obtained showed these components thus, compatibility and helpfulness, subjective satisfaction, efficiency and accuracy and learnability as the critical factors affecting the usability of Igbinedion University Online portal system.

MATERIALS AND METHODS

In determining if there exist significant difference among students perception from various Colleges using the IUO portal system, responses from the 50 item online questionnaire developed and used to identify the four critical factors affecting the usability of Igbinedion University, Okada (IUO) Online Portal System by Omorogiuwa and Chiemeké (2008) was further subjected to statistical analysis using ANOVA and Post Hoc test tools in SPSS 14. The online questionnaire is based on Software Usability Measurement Inventory (SUMI) questionnaire designed in 1990 by HRFG (Human Factor Resource Group). It was developed using HyperText Markup Language, Microsoft Frontpage and Microsoft Visual Basic. The online questionnaire was opened for user's responses within a period of 6 months (January-June 2007). The respondents were mainly students from the various colleges of IUO. A total of 178 students,

responses were used for data analysis. This consists of 39 students (College of natural and applied science), 74 students (college of health science), 7 students (college of arts and law) and 51 students (college of social science and management science). A total of 11 students had incomplete data and as such was not used for analysis.

RESULTS AND DISCUSSION

Users' responses from the 50 items online Usability test questionnaire were subjected to data analysis using SPSS 14. From these responses, 4 critical factors were earlier identified by Omorogiuwa and Chiemeke (2008). These factors are Compatibility and Helpfulness, Subjective Satisfaction, Efficiency and Accuracy and Learnability. In this research, student's perceptions based on the four factors earlier identified were further subjected to ANOVA and Post Hoc Tests using SPSS 14.

Table 1 shows the mean scores of all the levels with the 4 factors (compatibility and helpfulness, subjective satisfaction, efficiency and accuracy and learnability), it

shows that there are differences in the usability perception of Igbinedion University online portal system.

Table 1: Representation of the mean scores for students of different college to the usability factors

Factor	Level	N	Mean	SD	SE
Test for compatibility and helpfulness	100	38	38.66	9.222	1.496
	200	51	39.82	6.881	0.964
	300	56	39.39	8.798	1.176
	400	25	35.96	7.271	1.454
	Total	170	38.85	8.183	0.628
Subjective satisfaction	100	41	24.95	5.822	0.909
	200	54	27.24	4.273	0.582
	300	55	24.15	5.516	0.744
	400	26	23.85	7.439	1.459
	Total	176	25.24	5.700	0.430
Test for efficiency and accuracy	100	42	15.00	2.399	0.370
	200	56	14.84	2.287	0.306
	300	57	14.93	2.321	0.307
	400	26	15.54	2.404	0.471
	Total	181	15.01	2.332	0.173
Test for learnability	100	42	16.76	2.878	0.444
	200	54	16.89	3.032	0.413
	300	55	16.38	2.369	0.319
	400	26	15.96	2.068	0.406
	Total	177	16.56	2.671	0.201

Table 2: Analysis of Variance (ANOVA) among the different colleges and departments

Factors	Colleges/department	Sum of squares	df	Mean square	F	Sig
Test for compatibility and helpfulness	Between groups	399.197	4	99.799	1.474	0.213
	Within groups	10835.312	160	67.721		
	Total	11234.509	164			
Subjective satisfaction	Between groups	487.732	4	121.933	3.930	0.004*
	Within groups	5150.455	166	31.027		
	Total	5638.187	170			
Test for efficiency and accuracy	Between groups	22.983	4	5.746	1.036	0.390
	Within groups	948.812	171	5.549		
	Total	971.795	175			
Test for learnability	Between groups	18.502	4	4.625	0.632	0.640
	Within groups	1214.001	166	7.313		
	Total	1232.503	170			

Significant at p<0.05

Table 3: Post hoc test among various colleges and departments in the university

Dependent variable	Area of study (i)	Area of study (j)	Mean difference (i-j)	SE
Subjective satisfaction	Engineering	Natural/applied science	-0.32	2.451
		Health science	-1.68	2.367
		Arts and law	-3.29	3.099
		Social Sci., Bus./Mange. Sci.	2.12	2.409
	Natural/applied science	Engineering	0.32	2.451
		Health science	-1.36	1.127
		Arts and law	-2.96	2.296
		Social Sci., Bus./Mange. Sci.	2.45	1.213
	Health science	Engineering	1.68	2.367
		Natural/applied science	1.36	1.127
		Arts and law	-1.61	2.205
		Social Sci., Bus./Mange. Sci.	3.80*	1.032
	Arts and law	Engineering	3.29	3.099
		Natural/applied science	2.96	2.296
		Health science	1.61	2.205
		Social Sci., Bus./Mange. Sci.	5.41	2.251
	Social Sci., Bus./Mange. Sci.	Engineering	-2.12	2.409
		Natural/applied science	-2.45	1.213
		Health science	-3.80*	1.032
		Arts and law	-5.41	2.251

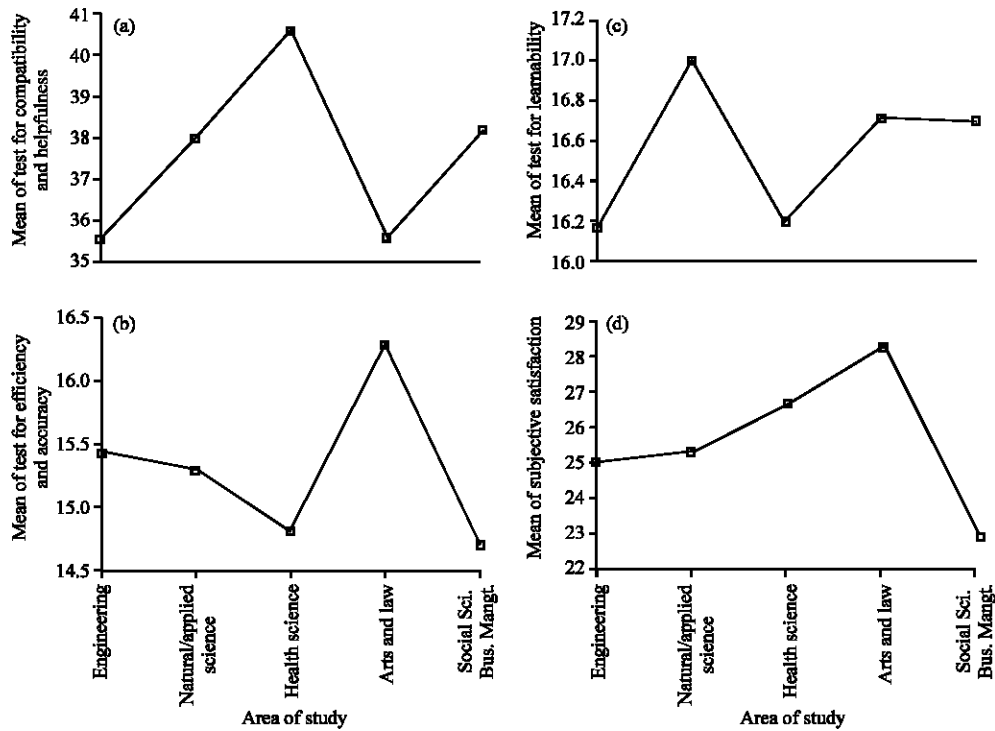


Fig. 1: Graphical representation of students perception to the software usability factors

The graphs in Fig. 1 illustrate the relationship between the user's perceptions to the critical factors affecting the usability of IUO Online portal system. A major significant difference however, can be observed when we compare the results obtained for all the groups that used the IUO Online Portal System in Table 1. The Analysis of Variance (ANOVA) of the IUO Online Portal System in Table 2 shows statistical significant difference only at Subjective Satisfaction (0.004*), significant at $p < 0.05$. This implies that even if the graphs in Fig. 1 shows differences in usability perception to the 4 factors, none of these differences is significant. Furthermore, to actually know where this significant difference lies among the different colleges and departments, a Post Hoc Test was carried out. Post Hoc Test is a multiple comparison method among and within components that is analyzed to determine the significant difference among them. This is indicated by an (*) in the mean difference.

The Post Hoc Test in Table 3 revealed a significant difference in subjective satisfaction only between students in health sciences and social science/business management science as indicated by the asterisk (*). All other differences in perception of the usability of IUO Online Portal System among the other students from the various colleges are statistically insignificant.

CONCLUSION

It should be noted, that comparative analysis of mean score and pictorial analysis of the critical factors in Table 1 and Fig. 1 shows that there are differences in perception to the critical factors affecting the usability of IUO online portal system but, such differences are not significant. ANOVA test shows there is significant difference only at subjective satisfaction (0.004*), significant at ($p < 0.05$). However, to actually know and pinpoint where this significant difference lies among the different colleges and departments, a post Hoc test was carried out. The post Hoc test revealed a significant difference in subjective satisfaction only between students in health science and social science/business management science as indicated by the asterisk (*) in mean difference column in Table 3. However, in the test for subjective satisfaction, there are also differences in usability perception among students from various colleges, but only a significant difference lies among the students of health sciences and social science/business management science as shown in post hoc test in Table 3.

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