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DETERMINANTS OF STUDENTS UTILISATION OF COMPUTER INFORMATION RETRIEVAL SYSTEMS IN ACADEMIC LIBRARIES: EVIDENCE FROM THE UNIVERSITY OF GHANA or A CASE STUDY OF THE UNIVERSITY OF GHANA

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Abstract

A number of educational institutions and libraries have established computerised information retrieval systems (CIRS) to help students to easily identify resources for their academic pursuit. The study investigates and retests the Unified Theory of Adoption and Use of Technology as a model for explaining technology (UTAUT) use among library users in the University of Ghana (UG). A questionnaire with 31 items based on the UTAUT study of Venkatesh et al (2003) and analysed on a 7 point Likert Scale was distributed to students who used the Balme Library in May, 2014. The results reveal that many students judge their ability to use the computer information retrieval system to accomplish the specified task as poor due to non-familiarity with the system. It is noted that a lot of students also doubt the ability of the system to provide the required responses they are looking for. This may be due to misconceptions from previous experiences or information gained from other people who have not been successful in using the information retrieval system. The study recommends that the Library incorporates the basic skills of interacting with the CIRS in its orientation programme to give students an acceptable perception of the CIRS.

Keywords: Computerised information retrieval system, Balme Library, University of Ghana, Academic libraries, Information retrieval

Introduction

The mandate of the academic library is to provide needed information to support the parent institution to achieve their objectives. In view of this, the University of Ghana (UG) library strives to play a leading role in the teaching, learning and research activities of its parent institution (UG). To achieve this objective, the library needs to be dynamic in the provision of its services and must be manned by personnel of the highest quality, who possess adequate background in information handling and dissemination, appropriate professional training and experience, and the proper orientation to meet the challenges of a modern university environment. The library is mandated to provide current and relevant information in all formats to support teaching, learning and research activities (Ariyapala & Edzan, 2002). However, the advent of Information and Communication Technology (ICT) has drastically changed the nature of traditional library services. Perhaps in any discussion of the application of modern technology in the library, as revealed by Jansen & Pooch (2000), the first thing that comes to mind is the computer. The computer has made such a tremendous impact on the organization, management and dissemination of information that it readily commends itself to any library ready to accept it (Liaw & Huang, 2003). When computers first made their impact on libraries especially with the automation of house-keeping routines, resource managers had expected financial savings as machine took over the work of humans. However, in libraries, automation has enabled them to provide new and innovative range of services, to improve the quality of work performed by students, simultaneously saving them time

when searching for information (Liyana et al, 2010).

Computers in libraries have proved useful in assisting the information processing aspects of traditional library operations like acquisitions, registration of readers, circulation functions and keeping track of reading and research interests of users. Thus, repetitive and routine data processing tasks, which characterized most library operations, are effectively and efficiently handled by computers (Bitirim et al, 2002). The computerization/automation of university library services helps to improve the quality of services that the library renders to its patrons. Some of the benefits of automation include enhanced productivity, more productive tasks in documentation and information processing, network enhancement and improved control of records management and retrieval (Gui, 2007).

The computerization of a university library, therefore, leads to a change in the way the library offers services to its patrons. Change is a natural phenomenon in growth and development. Human beings are known to respond differently to changing situations thus, reflecting in their attitudes towards the object of change. Fear of change is similarly a natural human reaction. Every human being develops control over familiar situations, and in most cases, feels comfortable with the familiar rather than the unfamiliar concepts (Jegede, 2005). A computerized library comprises not only facilities and formats, but also the essential human elements: users and staff. The success of any library system, after all, rests not on how well the design works on paper, in abstract, but on how readily people will accept it and how effectively they can use it.

Research Questions

The study sought to find out the following:

- How often do students use the library?.
- What is the performance expectancy of the CIRS by the students?
- What are the students' attitudes towards using the CIRS?
- What are the factors or conditions that support the use of the CIRS?
- What personal factors, abilities or skills needed for the use of the CIRS?
- What are the motivational factors for the use of the CIRS?

Research objectives:

Even though it is the expectation of management of the library that the computerised information retrieval system would be significantly adopted by many of the students and other patrons of the library, there might be challenges with full adoption pre-empting this research. The study therefore attempted to find out students' attitude towards the CSIR of the Balme Library, the exact factors which determined the adoption and use of technologies like computerised information retrieval system and aimed at finding out the following:

- The extent to which students were using the CIRS
- Assessed the efficiency of the CIRS in information retrieval
- To ascertain students' satisfaction of the CIRS
- Identified the challenges (if any)and the causes of these challenges and
- suggested ways to address these challenges

Review of related literature

The use of information retrieval (IR) in electronic form can be traced back to the 1960s where the management of full text and multimedia document had been electronically catalogued in a range of models and systems (Saiti and Prokopiadou, 2008). The IR system functions in a way as to inform the user about the existence or non-existence of document(s) related to user request and helps facilitate user information retrieval that is related to their desired needs in a more effective and efficient manner (Dougan, 2012). Thus, an IRS according to Heinrich and Willis (2014) is not just a system that stores and retrieves information, but also consists of a set of components which are interrelated together to facilitate searching processes. The Online Public Access Catalogues (OPAC), Internet search engines, subject directories, and online databases among others have been identified as the most

common IRS tools used by various researchers and students in their quest to search for information (Nazari, 2012; Catalano, 2013; Yuan and Belkin, 2014).

The literature on the use of computerized information retrieval systems by students reviewed indicates that although the digital age has enhanced and made information seeking easier and less difficult to students as compared to the traditional method of seeking information, students still encounter some difficulties when it comes to the ability to find scholarly information that may suit their learning and research needs (Julien and Barker, 2009; Abdullah and Ismail, 2010; Barrett, 2005; Eskola, 2005; Nicholas et al., 2006; Shipman et al., 2005). In Saad and Zainad's (2009) view, new knowledge is a requisite for all students, but knowledge is most often produced by combining information from different sources, often referred to as information retrieval skills. Thus, there is the need for the student to attain the ability to look for information in such a way that non-relevant data (noise) are excluded, while relevant information is found.Attitudes are enduring patterns of belief, believed to be predictive of behavior, reflecting people's biases, inclinations or tendencies that influence their response to situations, activities, people or programme goals. Students vary in their information needs and their seeking attitudes (Malik & Mahmood, 2009). They constitute a part of society which is fortunate to have access, at little or no cost to themselves, to a variety of computerized services in their institutions' libraries. This is made possible because universities use considerable proportions of their budget to provide these technologies for their students to assist in the teaching, learning and research processes. One of the major barriers in implementing new innovations in libraries is not only technical but also attitudinal, as positive attitude towards technology contributes to the better performance in a technologically advanced environment (Batthini & Madnani, 2003). In the context of Ghana, a number of educational institutions and libraries have established computerised information retrieval systems to help students to easily identify resources for their academic pursuits. One of such effort is that of the Balme Library of the University of Ghana which may be described as the premier academic library in Ghana (Fordjour et al, 2010).

Theoretical Framework

Venkatesh et al. (2003) published the results of a study that developed and validated a new research model with seven constructs: performance expectancy, effort expectancy, attitude toward using technology, social influence, facilitating conditions, self-efficacy, and anxiety, which are hypothesized to be fundamental determinants of the user behavioural intention of information technology. These constructs derive from eight different User Acceptance Models (Bagozzi, 2007). The objective of this research was to investigate and test the UTAUT model on students acceptance and use of computerized information retrieval system to achieve both the objective of accumulating further evidence concerning the validity, consistency, and correlation of the model and to proffer a possible explanation as to why the acceptance level of the computerized information retrieval system is low among students who patronize the Balme library. This will serve as a key reference point for future managerial and administrative policies aimed at ameliorating the current system.

Technology Acceptance Models

For many years, a lot of studies on the MIS implementation have been performed to identify and assess organizational characteristics that lead to an information system success or failure (Verhoeven et al., 2010). At present, many user acceptance models with different determinants are created to measure the user agreement of information systems which is an important factor to indicate a system success or failure (Scherer, 2005). Each theory or model has been widely tested to predict user acceptance (Benbasat and Barki, 2007). However, no comprehensive

instrument to measure the variety of perceptions of information technology innovations had existed until Venkatesh et al (2003) attempted to review and compare the existing user acceptance models with an ultimate goal to develop a unified theory of technology acceptance by integrating every major parallel aspect of user acceptance determinants from those models. The eight original models and theories of individual acceptance that are synthesized by Venkatesh et al. (2003) include the Theory of Reasoned Action (TRA), Technology Acceptance Model (TAM), Motivational Model (MM), Theory of Planned Behaviour (TPB), Model Combining the Technology Acceptance Model and Theory of Planned Behaviour (C-TAM-TPB), Model of PC Utilization (MPCU), Innovation Diffusion Theory (IDT), and Social Cognitive Theory (SCT). Constructs of each model and theories, including the UTAUT model, are represented in Table 1.

Table 1: Models and Theories of Individual Acceptance

Models and Theories	Constructs
Theory of Reasoned Action (TRA) by Fishbein and Ajzen (1975) derives from psychology to measure behavioural intention and performance.	Attitude Subjective norm
Technology Acceptance Model (TAM) by Davis (1989) develops new scale with two specific variables to determine user acceptance of technology. Technology Acceptance Model 2 (TAM2) by Venkatesh and Davis (2000) is adapted from TAM and includes more variables.	Perceived Usefulness Perceived Ease of Use Subjective Norm* Experience* Voluntariness* Image* Job Relevance* Output Quality* Result Demonstrability* * indicates TAM2 only
Motivational Model (MM) also stems from psychology to explain behaviour. Davis et al. (1992) applies this model to the technology adoption and use.	Extrinsic Motivation Intrinsic Motivation
Theory of Planned Behaviour (TPB) by Ajzen (1991) extends TRA by including one more variable to determine intention and behaviour.	Attitude Subjective norm Perceived Behavioural Control
Combined TAM and TPB (C-TAM-TPB) by Taylor and Todd (1995).	Perceived Usefulness Perceived Ease of Use Attitude Subjective norm Perceived Behavioural Control
Model of PC Utilization (MPCU) by Thompson et al. (1991) is adjusted from the theory of attitudes and behaviour by Triandis (1980) to predict PC usage behaviour.	Social Factors Affect Perceived Consequences (Complexity, Job-Fit, Long-Term Consequences of Use) Facilitating Conditions Habits

Innovation Diffusion Theory (IDT) by Rogers (1962) is adapted to information systems innovations by Moore and Benbasat (1991). Five attributes from Rogers' model and two additional constructs are identified.	Relative Advantage* Compatibility* Complexity* Observability* Trialability* Image Voluntariness of Use * indicates Roger's constructs.
Social Cognitive Theory (SCT) by Bandura (1986) is applied to information systems by Compeau and Higgins (1995) to determine the usage.	Encouragement by Others Others' Use Support Self-Efficacy Performance Outcome Expectations Personal Outcome Affect Anxiety
Unified Theory of Acceptance and Use of Technology Model (UTAUT) by Venkatesh et al. (2003) integrates above theories and models to measure user intention and usage on technology	Performance Expectancy Effort Expectancy Attitude toward Using Technology Social Influence Facilitating Conditions Self-Efficacy Anxiety

Source: Compilation of the researcher

With the UTAUT, Venkatesh et al (2003) think it is an enhancement of all the models of technology acceptance since it builds on eight different theories of technology acceptance which have been brought together to help explain technology adoption and the rate of adoption. Venkatesh et al (2003) explain that user' intentions in using a particular information system and subsequent adoption of that technology as a way of life are dependent on four main factors. These include the expected performance level of the technology, the expected effort that must be put into that particular technology compared with what pertains in the past. Furthermore, Venkatesh et al (2003) explain that the third factor which directly affects the rate or perceived interest in technology adoption is the social influences that persist within the environment of the individual and then finally the presence of factors or conditions which generally facilitate adoption (Turban et al, 2008). In the view of Venkatesh et al. (2003), the adoption and use of technology is also not the same for people with different demographic backgrounds such as male and female, young and old and other factors like experience, and voluntariness of use. The use of the Balme Library's CIRS was assessed through a consideration of eight information systems usage behavioural theories which include the personal computer use model, reasoned action theory , motivational model technology acceptance model, planned behaviour theory and a combination of planned behaviour/technology acceptance model, Roger's (1995) diffusion of innovation theory and Bandura's (1976) social cognitive theory

The use of UTAUT has been validated in different forms of research including a longitudinal study by Sykes et al (2009) that found out that the four factors that have

been explained above account for 70% of the use of the new technology. In a research conducted by Eckhardt et al. (2009) the UTAUT model was applied to assess how social groupings at the workplace, such as reference groups (colleagues and superiors,) plays some role in determining whether a person can use or not use technology and the rate of use of the technology. The results suggested that among all the 152 German companies that were examined, there was a significant impact or relationship between an organisation's social environment and the rate of adoption of technology. According to Curtis et al (2010) the UTAUT organizations with a clearly defined public relations sector have a higher propensity to adopt and use social media technologies towards achieving their goals based on the analysis of evidence from 409 media related companies in America. In that same study Curtis et al (2010) found out that more women demonstrated a willingness to use social media considering the fact that they found it as more beneficial than the men exhibited. That means that the expected usefulness for women is found to be superior to those of men. Moreover, the research by Verhoeven et al (2010) also suggests that the UTAUT model can explain the differences in the frequency of use of computers by students. This is based on studying 714 students in Belgium. The research noticed variation in frequencies of use of computer at the university level and how it differs from the use of such facilities in the secondary school level based on age and the knowledge of the students. The UTAUT model categorises user acceptance factors on seven key dimensions as follows:

Performance expectancy: the degree to which an individual believes that using a particular system would improve his or her job performance

- **Effort expectancy**: the degree of simplicity associated with the use of a particular system;
- **Attitude toward using technology:** the degree to which an individual believes he or she should use a particular system;
- **Social influence:** the degree to which an individual perceives that others believe he or she should use a particular system;
- **Facilitating conditions**: the degree to which an individual believes that an organizational and technical infrastructure exists to support the use of a particular system;
- **Self-efficacy**: the degree to which an individual judges his or her ability to use a particular system to accomplish a particular job or task; and
- **Anxiety:** the degree of anxious or emotional reactions associated with the use of a particular system.

Methodology—Data Collection and Analysis

A descriptive survey research design was adopted for the study. The study population is made up of students of the University of Ghana in excess of 30000 students. The respondents were randomly selected from students, who used the Balme library in May, 2014. A total of 400 questionnaires were administered and 345 representing approximately 86% were returned and analysed. The respondents included 19 post graduates, 31 graduate students, 289 undergraduates, and 5 non-degree/Diploma programmes and 1 student (who did not state hi/her status).

The 31 questionnaire items were adapted from the UTAUT study of Venkatesh et al. (2003). These items represent independent and dependent variables utilized to measure the behavioural intentions of students to use the computer retrieval system in the Library. Other than wording modifications to fit the specific technology studied in this research, no changes were made to the user acceptance scale. All items were measured on a seven point Likert scale, where 1 = completely disagree, 2 = moderately disagree, 3 = somewhat disagree, 4 =

neutral (neither disagree nor agree), 5 = somewhat agree, 6 = moderately agree, and 7 = completely agree. The reliability of the instrument was rigorously tested through a pre-test among students after which the wordings were refined according to the feedbacks. The combination of these traits made it possible to produce unbiased estimates of population totals, by weighting sampled units according to their probability of selection. The number of respondents was sampled by a mathematical computation based on accessible population model as follows:

$$n = \frac{2{,}500 \times N \times Z^2}{[25(N-1)] + [2{,}500 \times Z^2]}$$

- n= required sample size
- N= population size (30,000)
- Z= number of standard errors (1.96 for 95% confidence level)

This model is supported by Saunders (2007, p.212), and validated by Dabholkar and Bagozzi (2002) Marzocchi and Zammit (2006), despite its limitations. It was adopted for estimating the sample size for the study.

Analysis of Results

In all 345 students were selected from different schools, halls and different levels of study in so far as they frequented the library for information purposes**.** First of all, the correlation among constructs was examined. The factor loading for scale items based on the VARIMAX rotation is shown in Table 4. The highest total variance of the item loading represented 75.55 percent without the construct FC and items AT1, SE1, SI3 and SI4. As such, these eight items were dropped from the experiment. Most of the remaining items represented good convergent and discriminant properties. Only items AT and SI tended to be grouped together. This occurrence could be interpreted to mean that both of these constructs were attitudes on technology usage. AT is the user's own attitude toward using technology and SI is the attitude of people who influence the user toward using technology. Items representing subcomponents of the same construct were all significantly and highly correlated. Twenty three items were divided into six constructs. Overall, the constructs developed by Venkatesh et al. (2003) fared well in this replication, even though they were based on different samples and context settings. This is vital because it indicates the general applicability of these constructs for different types of research questions. Summarily, this analysis confirms the validity analysis of the UTAUT model by showing strong correlation for most items belonging to the same construct as in Table 3.

Table 2 Factor Analysis with VARIMAX Rotation

	Component					
	1	**2**	**3**	**4**	**5**	**6**
AT3	**.829**	.136	.261	.002	.004	.079
SI1	**.810**	.001	.015	.106	.096	.168
AT4	**.800**	.086	.231	.009	.077	.136
AT2	**.798**	.110	.315	.028	-.003	.073
SI2	**.796**	.097	.056	.119	.084	.119
EE4	.101	**.873**	.090	-.169	.171	.098
EE3	.098	**.865**	.153	-.144	.141	.065
EE2	.136	**.852**	.159	-.089	.149	.032
EE1	.138	**.822**	.236	-.094	.134	.095
PE3	.354	.192	**.807**	-.036	.175	.090
PE2	.330	.173	**.804**	-.037	.193	.115
PE1	.212	.318	**.735**	-.050	.238	.096

PE4	.384	.190	**.692**	.038	.089	.063
AX3	.061	-.151	.001	**.885**	-.163	-.030
AX2	.038	-.052	.045	**.841**	-.049	.066
AX4	.071	-.163	-.118	**.792**	-.128	-.092
AX1	.105	-.102	.002	**.651**	-.009	.288
BI2	.115	.248	.267	-.156	**.870**	.090
BI3	.156	.282	.226	-.155	**.869**	.113
BI1	.133	.289	.189	-.172	**.840**	.137
SE3	.227	.071	.124	.068	.153	**.832**
SE2	.255	.169	.112	.027	.022	**.803**
SE4	.169	.070	.056	.088	.090	**.787**

Note: Item loadings on their theoretically associated factor are highlighted in bold.

Assessment of Reliability

While the construct validity is a measurement between constructs, the reliability is a measurement within a construct. The concern on reliability is how well a set of instrument items selected for a given construct measure the same construct. For this study, to analyse whether one construct is independent of and calculated separately from that of other constructs, the Cronbach's Alpha method and Inter-Item Correlation Matrix were used. Every construct in Table 4 demonstrates a high level of reliability coefficient or internal consistency. It needs to be noted that a reliability coefficient of .70 or higher is generally considered acceptable, according to Venkatesh et al. (2003). For the constructs in the present experiment, the numbers of the Cronbach's Alpha are .90 for AT&SI, .92 for EE, .90 for PE, .82 for AX, .96 for BI, and .82 for SE, confirming the results of reliability analysis of constructs from the UTAUT model.

Table 3: Internal Factor Reliability by Cronbach's Alpha Technique

Construct	Cronbach's Alpha
AT&SI	**.90**
EE	**.92**
PE	**.90**
AX	**.82**
BI	**.96**
SE	**.82**

Additionally, the correlation among variables presented in Table 3 reflects the self-determining relationship between variables. All off-diagonal elements are close to zero, representing strong independence of each construct. The results of the inter-item correlation matrix provide more evidence to prove the reliability of the UTAUT scales.

Table 4: Inter-Item Correlation Matrix

	AT&SI	PE	EE	SE	AX	BI
AT&SI	1.000	.272	.578	.130	.272	**.413**
PE	.272	1.000	.478	-.272	.508	**.247**
EE	.578	.478	1.000	-.059	.506	**.331**
SE	.130	-.272	-.059	1.000	-.280	**.128**
AX	.272	.508	.506	-.280	1.000	**.290**
BI	**.413**	**.247**	**.331**	**.128**	**.290**	**1.000**

Assessment of Correlation

Based on the earlier validity and reliability analysis, AT&SI, EE, PE, AX, and SE were thought to be potentially important determinants of the behavioural intention to use the system. The R-Square value for the model of the current study is approximately 0.40, which is relatively high to determine the strength of linear relationship between the independent (AT&SI, EE, PE, AX, and SE) and dependent (BI) variables. However, after further analysis in the regression coefficient, the results demonstrate that only PE, EE, AX and SE affect BI, as shown in the research model below. Meanwhile, AT&SI is not significant to BI.

Descriptive Analysis

Table 5 – Descriptive Analysis of UTAUT Questionnaire

Scales / Items	Mean	S.D.
Performance Expectancy (PE)	22.63	4.57
PE1: I find the computerized information retrieval system useful in my study.	6.02	1.17
PE2: Using the computerised information retrieval system enables me to accomplish tasks more quickly.	5.72	1.30
PE3: Using the computerised information retrieval system increases my productivity.	5.58	1.27
PE4: Using The computerised information retrieval system increases my chances of getting relevant information	5.31	1.45
Effort Expectancy (EE)	24.21	4.03
EE1: The procedures involved with the computerised information retrieval system are clear and understandable.	5.97	1.17
EE2: It is easy for me to become skillful at using the computerised information retrieval system.	6.00	1.12
EE3: I find the computerised information retrieval system easy to use.	6.11	1.10
EE4: Learning to operate the computerised information retrieval system is easy for me.	6.14	1.09
Attitude toward Using Technology (AT)	19.80	4.87
AT1: Using the computerised information retrieval system is a good idea.	6.10	1.17
AT2: The computerized information retrieval system makes studying more interesting.	4.64	1.54
AT3: Studying with the computerised information retrieval system is fun.	4.37	1.54
AT4: I like studying with the computerised information retrieval system.	4.69	1.53
Social Influence (SI)	20.44	4.41
SI1: People who influence my behaviour think that I should use the computerised information retrieval system.	4.42	1.57
SI2: People who are important to me think that I should use the computerised information retrieval system.	4.55	1.55

SI3: My lecturers/Professors have been helpful in the use of the computerised information retrieval system.	5.52	1.32
SI4: In general, the university has supported the use of the computerised information retrieval system.	5.96	1.18
Facilitating Conditions (FC)	21.36	3.82
FC1: I have the resources necessary to use the computerised information retrieval system.	6.11	1.22
FC2: I have the knowledge necessary to use the computerised information retrieval system.	5.80	1.68
FC3: The computerised information retrieval system is not compatible with other systems I use.*	4.68	2.03
FC4: A specific person (or group) is available for assistance with the computerised information retrieval system difficulties.	4.78	1.58
Self-Efficacy (SE)	20.07	4.66
SE1: I can complete a task using the computerised information retrieval system, if there is no one around to tell me what to do.	5.55	1.35
SE2: I can always get support in the use of the computerised information retrieval system.	5.01	1.50
SE3: I can complete a job or task using the computerised information retrieval system, if I have a lot of time to complete the task for which the software is provided.	4.91	1.49
SE4: I can complete a task using the computerised information retrieval system, if I have just the built-in help facility for assistance.	4.59	1.67
Anxiety (AX)	11.18	6.25
AX1: I feel apprehensive about using the computerised information retrieval system.	3.19	2.04
AX2: It scares me to think that I could lose a lot of information using The computerised information retrieval system by hitting the wrong key.	2.97	1.97
AX3: I hesitate to use the computerised information retrieval system for fear of making mistakes that I cannot correct.	2.45	1.76
AX4: The computerised information retrieval system is somewhat intimidating to me.	2.57	1.95
Behavioral Intention to Use the System (BI)	18.72	3.45
*BI1: I intend to use the computerised information retrieval system in the future.	6.15	1.27

BI2: I predict I would use The computerised information retrieval system in the future.	6.28	1.16
*BI3: I plan to use the computerised information retrieval system in the future	6.29	1.15

Note: * indicates reversed scale.

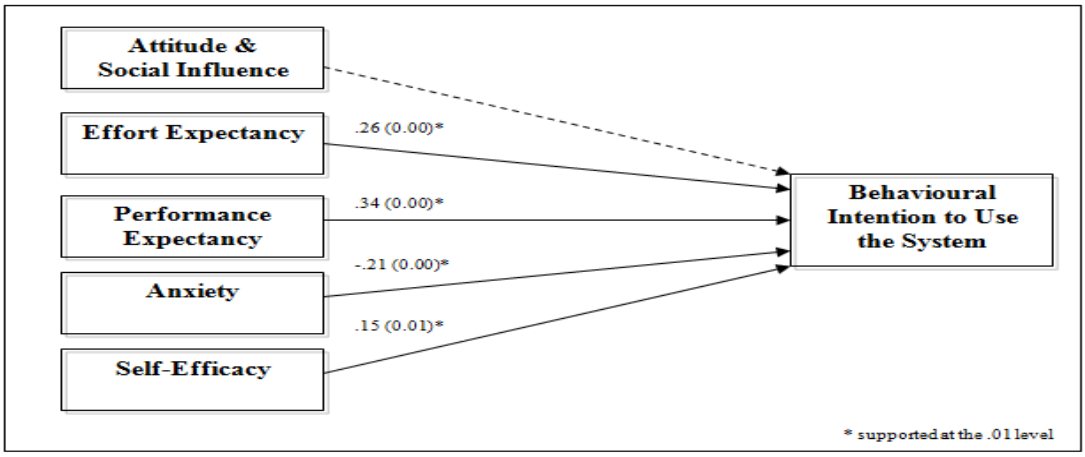

Figure 1: Research Model

Table 6: Regression Coefficients for Predictors

Predictor Variables	Standardized Coefficients (SE)	Significance
AT&SI	-.264 (.227)	.64
EE	.26 (.376)	.00
PE	.34 (.323)	.00
AX	-.21 (.128)	.00
SE	.15 (.232)	.01
R-Square (R-Square Adjusted)	.40 (.38)	

The data from Table 6 and figure 1 show that the coefficients for EE, PE, AX, and SE are statistically significant (p-value <= .01). Moreover, PE is found to have the greatest impact on BI (β = .34). The data also demonstrate that EE (β = .26), AX (β = -.21), and SE (β = .15) are important elements to the BI assessment. Finally, the data indicate that AT&SI are not significant to the BI assessment. Nor is the coefficient for AT & SI (β = -.264) statistically significant, compared to EE, PE, AX, and SE. In summary, the result from the experiment can be interpreted to mean that only effort expectancy, performance expectancy, anxiety, and self-efficacy are significant factors that determine the students' acceptance of computerized information retrieval system. Further analysis of the results shows that a change (increase) in age by one unit based on our earlier classification of ages of the respondents in Table 1.0 reflects a negative and significant change in performance expectancy (-.060049), effort expectancy (-.036696), attitude towards using technology (-.017051), anxiety (-.021714) and self-efficacy (-.092366). This means that an increase in age has a negative and significant change on these internal stimulants to the adoption and use of technology but rather is positively correlated with the effect of external influential factors such as facilitating conditions (.032093) and social influence (.034102) attributes.

Table 7: ANOVA output on differences between age and impact of predictor factors

	Sum of Squares	df	Mean Square	F	Sig.
Performance Expectancy	5.383	1	5.383	5.001	0.00
Within Groups	246.534	229	1.077		
Total	251.917	230			
Attitude towards technology	1.329	1	1.329	0.492	0.00
Within Groups	618.64	229	2.701		
Total	619.969	230			
Effort Expectancy Between Groups	2.374	1	2.374	1.152	0.00
Within Groups	471.98	229	2.061		
Total	474.354	230			
Social Influence Between Groups	1.413	1	1.413	0.772	0.00
Within Groups	418.821	229	1.829		
Total	420.234	230			
Facilitating Conditions Between Groups	1.424	1	1.424	0.779	0.00
Within Groups	418.468	229	1.827		
Total	419.892	230			
Self-Efficacy Between Groups	4.895	1	4.895	2.014	0.00
Within Groups	556.649	229	2.431		
Total	561.544	230			
Anxiety Between Groups	0.857	1	0.857	0.515	0.00
Within Groups	381.313	229	1.665		
Total	382.169	230			

Results of the ANOVA in Table 7 analysis indicate differences between age groups, affecting all constructs at significant levels. The difference lies between younger respondents (15-35) and older respondents (35+), suggesting that younger respondents better adopt technology because they perceive them as being easier to use, more enjoyable, speedier and offering more control than older respondents. This tendency also translates to the other constructs, since younger respondent's use modern ICT more frequently, have a better attitude towards and intention to use them and a lower need for interaction than older respondents do.

Conclusions

The information that has been collected has a lot of implications for the management of academic libraries especially as far as getting students and other patrons to accept, adopt and use computer information retrieval systems. The data show that a lot of students doubt the ability of the system to provide the required responses they are looking for. This may be due to misconceptions from previous experiences or information gained from other people

who (word-of—mouth) have not been successful in using the information retrieval system. This may be a common feature in academic libraries where books and other materials are moved about by students. The inability to locate books and other articles after series of use of a system creates discouragement and they eventually abandon the system. On the other hand, there is the perception that the system is not generally user friendly or involves complex processes before one is able to locate a particular item being sought for. Majority (82 %) of the respondents of the study judge their ability to use a particular system to accomplish a particular job or task as poor due to non-familiarity. There is a lesser self-motivation to take up the challenge of going through the computer process to get information. This may be due to the degree of anxious or emotional reactions associated with the use of a particular system.

Recommendations

Even though the issues that have been expressed by students (as indicated under conclusions, above) may be far from the truth in the use of information technology for retrieval purposes, there is a genuine concern requiring managers of the library to develop new measures to better educate the students. This will significantly disabuse their minds about their fears. In this the Library management should improve and publicise its social networks to link up to students at the personal level. This may bring the library closer to the student and help obtain vital information as and when necessary. There is also the need for the library to improve its orientation to include the benefits of the CIRS to reduce or remove students' doubts of the system's ability to provide the required responses that the patrons expect. Students may also be trained to be able to independently interrogate or interact more effectively with the CIRS.

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