Use of Subscribed Electronic Resources by Undergraduate Students at Sokoine University of Agriculture, Tanzania

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Abstract

This study assessed the use of subscribed electronic resources by undergraduate students at Sokoine University of Agriculture (SUA). The study aims at determining the students' awareness, access and use of subscribed electronic resources and to examine determinants of the use of subscribed electronic resources. The study used a cross-sectional research design to collect data from 120 respondents using structured questionnaire as the data collection tool. Data were coded on Statistical Package for Social Science (SPSS). The researchers calculated the frequencies, percentages and linear regression. Findings reveal that majority (90%) of respondents were aware of the availability of subscribed electronic resources. Furthermore, the most used e-resources were e-journal and e-books while the least used was e-dictionary. Furthermore, the results found that perceived usefulness and attitude significantly influenced students' use of subscribed electronic resources. The study reveals that age and year of study influenced students' use of subscribed electronic resources. The study concludes that usage of subscribed e-resources by undergraduate students was moderate. It is recommended that librarians in academic institutions should create regular creation of awareness on the subscribed e- resources to the library users. The study recommends that librarians, information science and educators who intend to promote electronic resources should ensure that they are useful. Moreover, creating awareness on the usefulness of electronic resources to change their attitude is another important factor. Marketing the electronic resources through outreach programmess and information literacy are necessary for all the students.

Keywords: Subscribed electronic resources, perceived usefulness, perceived ease of use, attitude, socio-demography and Sokoine University of Agriculture

Introduction

Rapid evolution of electronic resources has increased their production and reliance on them. This, in turn, demands in sustained effort in identifying and acquiring them in libraries world-wide (Raphael, 2020). Due to the advanced technology, most libraries have adopted the use of electronic resources. Electronic resources can be defined as digital resources that can accessed through computers or other electronic devices directly connected to the computer. This might include such resources as CD ROM drive or the internet infrastructures used in the creation, processing, storage, distribution of information and various services rendered (Okey-Okafo & Echedom 2022). An electronic resource includes e-books, online journals and electronic magazines (Singh & Mukherjee, 2018).

Changes in the traditional ways of documenting delivery services, from print to electronic, have come about speedily; hence, information services and libraries have changed significantly so that they can deliver this new technology efficiently to academics (Odede, 2018). These advantages include the fact that electronic resources are often quicker than accessing print indexes, especially when searching retrospectively and they are straight forward when wishing to use combinations of keywords (Muthurasu & Kannan, 2019). Also, to the remoteness learners or those who have inadequate time to access physical libraries, there is availability of searching materials and different information from the library through library access databases. Furthermore, various range of reading experiences is given to students to support literacy and reading, access to a stable range of resources for students and teacher (Akuffo & Budu, 2019). Subscribed electronic resources are those resources that have been implemented and made available for a certain institution to access for different materials by students, academic staff and researchers.

Subscribed electronic resources are one of the key elements which support the process of teaching and learning to students and research activities (Mawere & Sai, 2018). However, there is low usage of subscribed electronic resources among the undergraduate students in higher education institutions in Tanzania (Isibika & Kavishe, 2018). The consequence of low use of subscribed electronic resources to students is failure to get the relevant information relating to their information need. It narrows the possibility of getting various different access points instead of depending only on printed sources. Not only that but also wastage of time will be witnessed to search for information if electronic resources are not used. Besides, it might lead to failure to get broader information about the topic related

for information need. Therefore, this study intends to assess awareness and frequency of using subscribed electronic resources and the determinants of use of subscribed electronic resources as an influencing factor that can either cause low utilisation or high utilisation of subscribed electronic resources.

Technology acceptance model

Technology Acceptance Model (TAM) proposes that the three factors which influence adoption of technology are perceived usefulness (PU), perceived ease of use (PEU) and behavioural intention (BI). Perceived usefulness refers to the degree to which a person believes that the use of the system will improve his or her performance whereas perceived ease of use is the degree to which a person believes that using the system will be free of effort (Roy *et al.*, 2018). The attitude towards adoption depicts the prospective adopter's positive or negative orientation and/or behaviour towards adopting a new technology (Venkatesh & Davis, 2000). Usage could also be influenced by an individual's perception of the ability to use the technology (Yen & Wu, 2016). User attitude determines actual system use and is influenced by two major beliefs (PEU & PU). PEU has a direct influence on PU. Therefore, PEU and PU were hypothesised to be directly influenced by the system designed characteristic. The discussed theory is integrated in the study variables. The study hypothesised that PEU, PU and attitude do directly influence students' use of subscribed electronic resources. This study included only individual and institutional factors because the reviewed literature has shown that socio-demographic characteristics of the respondents act as control.

Methodology

Cross-sectional research design was used to collect data from 120 selected respondents at SUA, both from Edward Moringe Campus and Solomon Malhangu Campus. SUA is selected because it is one of the higher education institutions in Tanzania. Therefore, it provided a good setting for the study. Questionnaire was used as the main data collection tool from the selected respondents. The questionnaire contains questions on respondents' responses according to the study objectives.

A determinant of usage of subscribed electronic resources was measured by the respondents responding to the factors using five likert scales. Respondents were requested to rate their level of agreement on the items of each dimension using the scale strongly agree, agree, neutral disagree and strongly disagree. They were later scored as 5, 4, 3, 2 and 1, respectively for positive statement while 1, 2, 3, 4

and 5 for negative statement. Each respondent's self-assessment score was obtained by summing up all the information items for each dimension to get the total score for each determinant. The higher values indicated high level while low values indicated low level.

To assess the reliability of the research tool, the researchers conducted a pilot study with 20 respondents. The Spearman-Brown split-half Cronbach's alpha was calculated and it was 0.84 which is higher than 0.7. Hence, the research tool was reliable as per the recommendations by Hair *et al.* (2010). Quantitative data were coded on Statistical Package for Social Sciences (SPSS). The researchers determined frequency, percentages and multiple linear regression. Reliability analysis was conducted to assess the correlation among the items for of each study variables. A Cronbach's of 0.7 or higher indicates a reliable scale. In this study, a Cronbach's α obtained was 0.711 for PU, 0.750 for PEOU and 0.81 for attitude.

The Exploratory Factor Analysis (EFA) was carried out to determine validity of the study variables. Prior to perform EFA, the Kaiser-Meyer-Olkin (KMO) measure and Bartlett's test were conducted to determine whether it was appropriate to conduct factor analysis. The Kaiser-Meyer-Olkin score 0.830 which is significant means that data were appropriate to perform exploratory factor analysis. Furthermore, the Bartlett's test of spherically (1259.00, df=120 and p=0.001) means that correlation was not the same for all factors (Shrestha, 2021).

The validity of the research instruments was assessed using the Principal Components Analysis (PCA). The PCA was employed to reduce 23 statements into three dimensions. The study adopted an orthogonal rotation (Varimax rotation) which maximises variation in the matrix system. Also, the data was suppressed at 0.4 factors loading. Furthermore, the multiple regression equation used for analysis was as to analyse the determinant influencing the use of subscribed resources which were:

$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \ldots + \beta_n X_n + \varepsilon$,

Where;

Y= Electronic resources usage score

β= Regression Coefficients

β_0= Intercept

i.   Sex (1-Male, 0-Female)

ii.   Age of the students was measured as respondent's age in number of years

iii.   Year of study(1=First, 2-second, 3-Third, 4-Fouth, 5-Fifth)

iv.   Attitude total score

v.   Perceive easy to use total score

vi.   Perceive usefulness score

Results and Discussion

Demographic characteristics of respondents

Both male and female respondents participated in this study. The results showed that more than half (51.7%) of the respondents were male while less than half (48.3%) were female (See Table 1). This indicates that the majority of the respondents in this study were male respondents. This disproportional sex composition is due to the nature of the population at the study area which was dominated with more male students. These results are similar to study by Nkebukwa (2016) which revealed that male form majority of respondents in higher learning institutions.

The results showed that majority (83.4%) of the respondents belonged to ages ranged between 18 and 26. This implies that young respondents dominated the sample. High number of young respondents could be influenced by the reason that most of the undergraduate students' higher institutions in Tanzania are likely to access e- resources in their daily activities. Most of young adults spend much time on the internet either for academic use or any other activities. Furthermore, the study revealed that 27.7 per cent, 30.5 per cent and 31.7 per cent were first, second and third year while four and fifth year were 10% and all the respondents. Low number of fourth and fifth year was due to number of course with offered with the duration of four and five years at the study area.
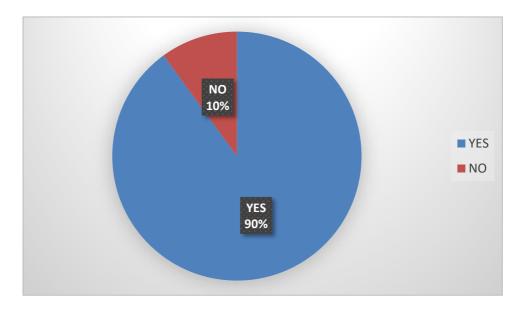
It was revealed that majority (97.5%) of the respondents owned the ICTs devices. It was found that most of the respondents owned such devices as smartphones, computer devices and tablets. Likewise, it is expected that ownership of ICTs devices may enhance students' access and use of subscribed electronic resources. This is in line with the study by Mwamasso and Onyango (2020) who revealed that ownership of ICTs devices among students in higher learning institutions is high.

Table 1: Socio-demographic characteristics of students (n=120)

Variables	n	%
Sex		
Male	62	51.7
Female	58	48.3
Age categories		
18-20	5	4.2
21-23	36	30.0
24-26	59	49.2
27-29	17	14.2
30- Above	3	2.15
Year of study		
First year	33	27.5
Second Year	37	30.8
Third Year	38	31.7
Fourth Year	6	5.0
Fifth Year	6	5.0
Ownership of ICTs devices		
Yes	117	97.5
No	3	2.5

Awareness on the existence of subscribed electronic resources by undergraduate students

Table 1 below shows the awareness of the undergraduate students on the existence of subscribed electronic resources. It indicates that majority (90%) of the respondents were aware of existence of subscribed electronic resources at the

University library. Only few students (10%) were not aware of the existence of the subscribed electronic resources. This is similar to the study by Bwalya and Ssebbale (2017) which revealed that most of the respondents were aware of the existence of subscribed electronic resources at the University. Moreover, this is in line with Isibika and Kavishe (2018) whose study revealed that many respondents were aware of the availability of electronic resources at the University library. From the findings, one can point about clearly that there were no good strategies that were used to create awareness on the available electronic resources for the users.

Figure 1: Responses of the respondents on awareness on the existence of subscribed electronic resources at the study area

Types and frequency of using e-resources
The respondents were asked to indicate the types of subscribed electronic resources they used. Furthermore, the results showed that majority (73.3%) of the respondents used subscribed e-databases. Additionally, the study sought to examine the frequency of using the mentioned e-resources used by respondents. Figure 2 summarises the responses obtained.
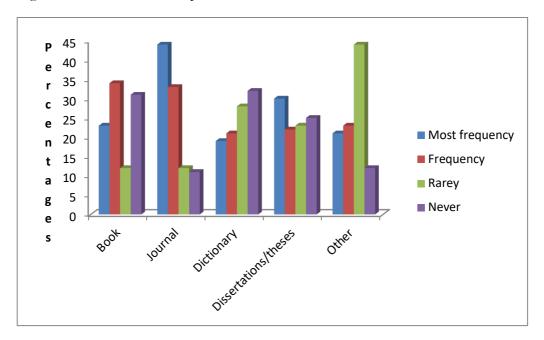

Figure 2: Types and frequency of using e-resources

The results indicate that most of the respondents used different types of open access electronic resources. The most used were e-journal followed by e-books and dictionaries. In addition, about one quarter (25.2%) of the respondents never accessed and used dissertations. The study's findings imply that the respondents used subscribed electronic resources to accomplish their academic activities. Journals were found to be used more frequently than other resources. This is contrary to a previous study by Mollel and Mwantimwa (2019) which found that there were low usages of subscribed electronic resources among the academic community.

It was revealed that e-book which is considered as the most important tool for academic purposes was the second most useful resource. This could be influenced by the reason that in subscription resources, users' choices were limited to the e-databases and resources their institution could afford while there is a wide range of open access resources available through search engines such as Google (Lwoga & Sukums, 2018). In addition, the type of the electronic resources utilised might depend much on the need for usage on academic purpose. Most of the students when doing research consult the most current and frequently published information. In this regard, journals are the good sources of information. Therefore, there is a need to create awareness on available e-books which may be accessed through the subscribed electronic resources by students to access the current and published books which are available on subscribed e-databases.

Determinants of use of subscribed electronic resources by the undergraduate students

Prior to performing multiple linear regression, PCA was performed to assess the construct validity. Table 2 shows the mean score of the 14 items while Table 3 shows the results from PCA. All the six factors explained more than half (59.46%) of the total variation. The first principal component (PC1) accounted for 40.87 per cent of the total variation. The first principal represents statements related to the perceive usefulness (See Table 3). The statements under this component include respondents perceive usefulness of using subscribed electronic resources on students' performance and relevancy of information. The mean value of four items associated with the first principal component is close to 4.2. This means that most of the respondents indicated that they agreed that subscribed electronic resources were useful in improving students' performance. The second principal component accounted for 10.20 per cent of the total variation. It comprised of the statements related to attitude towards using subscribed electronic resources.

The mean score for all the items related with this component is higher than 4.0. This implies that most of the students had positive attitude towards the use of subscribed electronic resources. The third principal component accounted for 8.39 per cent of the total variation; it contained statements related to perceive easy of using electronic resources. The mean score was generally near 4.1; this implies that respondents agree with the items.

Table 2: Descriptive statistics for the responses on the use of subscribed electronic resources

Items	Mean	Std. Deviation
I find that subscribed electronic resources are very useful in my studies.	4.48	.622
I can properly access and retrieve relevant information when using subscribed electronic resources.	4.21	.152
Using subscribed electronic resources enables me to get exact materials that I require.	4.12	.237
Using subscribed electronic resources improves the quality of my work as well as academic performance.	4.13	.773
Using subscribed electronic resources in sharing information would make my works more interested.	4.02	.680
Use of subscribed electronic resources for accessing information is a good idea.	4.03	.787
I have a generally favourable attitude towards using subscribed electronic resources in sharing information.	4.00	.766
Use of subscribed electronic resources for sharing information is easy for me.	4.12	.818
I have a generally negative attitude towards using subscribed electronic resources.	4.10	.123

It is difficult to access and share information through subscribed electronic resources.	3.29	.216
I find it user-friendly to use subscribed electronic resources	4.08	.872
Learning to use the subscribed electronic resources is easy for me.	4.09	.756
I find it easy to access information by using subscribed electronic resources.	3.21	.639
Use of subscribed electronic resources for sharing information is easy for me.	3.36	.654

Table 3: Factor loadings for various Principal Component Analyses of statements

Items	PC1 (40.87%)	PC2 (10.20%)	PC3 (8.39%)
I find that subscribed electronic resources are very useful in my studies.	.845		
I can properly access and retrieve relevant information when using subscribed electronic resources.	.795		
Using subscribed electronic resources enables me to get exact materials that i require.	.735		
Using subscribed electronic resources improves the quality of my work as well as academic performance.	.746		
Using subscribed electronic resources in sharing information would make my works more interested.		.823	.501
Use of subscribed electronic resources for accessing information is a good idea.		.817	

I have a generally favourable attitude towards using subscribed electronic resources in sharing information.		.697	
Use of subscribed electronic resources for sharing information is easy for me.		.662	
I have a generally negative attitude towards using subscribed electronic resources.		.814	
It is difficult to access and share information through subscribed electronic resources.		.806	
I find it user-friendly to use subscribed electronic resources.	.501		.755
Learning to use the subscribed electronic resources is easy for me.			.694
I find it easy to access information by using subscribed electronic resources.			.680
Use of subscribed electronic resources for sharing information is easy for me.			.530

PC1-First Principal component (Perceive usefulness ness)
PC2-Second Principal component (Attitude)
PC3-Third Principal component (Perceive ease of use)

Table 4 shows a regression model of the determinant of use of subscribed electronic resources by the undergraduate students. Six factors were included in the model: age, sex, year of study, attitude, perceive usefulness and perceive ease of use. The results showed that the Variance Inflation Factor (VIF) for all variables in the model ranged from 1.111 to 1.488 and met the VIF as stipulated by Pallant (2011) which states that the minimum VIF should be less than 10. Furthermore, the Durbin-Watson's d tests were used to test for auto-correlations. The results showed that the Durbin-Watson's is 1.744 which falls within the values of 1.5 < d < 2.5 (implying that there was no auto-correlation) (Kutner *et al.,* 2005). Hence, there was no auto-correlation in the multiple linear regression data.

Furthermore, the multiple R and coefficient of determination of the model were 0.611 and 0.387, respectively. This implies that the predictors in the model accounted for at least 38.7 per cent of the use of subscribed electronic resources. The multiple correlation of 0.611 implies that there was moderate, positive association between study independent variables and dependent variable.

Table 4: Determinants of using subscribed electronic resources by the undergraduate students

Determinants	Unstandardised Coefficients		Standardised Coefficients	t	p	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	.263	.932		.282	.779		
Age	.007	.077	.008	.090	.928	0.900	1.111
Sex	.211	.075	.214	2.760	.112	0.818	1.222
Year of study	.407	.075	.458	2.760	.007	0.863	1.159
Perceive usefulness	.135	.166	.088	.813	.041	0.823	1.215
Perceive Ease of use	.056	.155	.040	.360	.719	0.709	1.410
Attitude	.420	.216	.192	1.940	.051	0.672	1.488

Multiple R=.611; R Square=.387; Std. Error of the Estimate=4.62715; p=0.000; Durbin-Watson=1.744

Table 4 shows that age had a beta coefficient of .007. This meant that as age increased by one year, it increased the use of subscribed electronic resources by 0.007. This implies that younger respondents had lower chance of using subscribed electronic resources than adult ones. However, the variable was not statically significant (p>0.05). This is contrary to the study by Swain (2010) which found that there was statistical difference of the usage of subscribed electronic resources among the different age groups.

Likewise, a beta coefficient for sex was 0.211. This meant that male had a 0.211 more usage score of using subscribed electronic resources than female. However, the variable was not statistically significant (p>0.05). This implies that sex was not the factor influencing the use of subscribed electronic resources. These results are contrary to the study by Ford *et al.* (2001) which revealed that female tended to have low usage of finding information on-line. The results imply that gender gap relating to usage of electronic resources had been shrinking. A previous study found that there was a gap on usage of the internet among male and female students and that sex was among the determinants of internet use and attitudes. It was found that male seemed to enjoy browsing on the internet than females (Ono & Zovodny, 2003).

Furthermore, Table 4 shows that the year of study of the respondents did influence their use of subscribed electronic resources. It had a beta coefficient of 0.407 and was statistically significant at $p < 0.05$. It implies that one unit increased in education produced 0.407 increase score on the likelihood of using subscribed electronic resources. This implies that the respondents with higher education level had higher chances of accessing and using subscribed electronic resources. It could be explained by the fact that increases in education level increased respondents' awareness on the use of subscribed and gain skills on how to use the subscribed electronic resources. This conforms to a study by Ogbonnaya *et al.* (2011) who found that respondents with higher education levels had higher chances of using electronic resources. Students with higher education are likely to gain high level of internet skills which might influence utilisation and non-utilisation of electronic information resources in libraries.

Moreover, Table 4 shows that perceived usefulness was positive by 2.574 and it is significant ($p = 0.041$). This implies that an increase on the perceived usefulness score of the respondents by one unit also it increased the usage of subscribed electronic resources by 2.573 score. This means that the respondents who had high perception on the usefulness of the subscribed electronic resources had high usage of it. This is similar to the study by Salloum *et al.* (2019) which found that perceived useful was the determinant of electronic resources. The use of subscribed electronic resource depends on its usefulness to the user. Mawere and Sai (2018) in their study found that for perceived usefulness, it showed a significant relationship to usefulness of electronic information resources among the students.

In addition, Table 4 shows that perceived ease of use was positive by 0.056. This implies that increase of the perceived ease of use score of respondents by one unit also increased the usage of subscribed electronic resources by 0.056. This means that the respondents with high perceived ease of use of the subscribed electronic resources had high usage of them. However, the variable was not statistically significant. This implies that perceived ease of use was not the determinant influencing factor for the usage of subscribed electronic resources. Lastly, Table 4 shows that the attitude towards subscribed electronic resources did influence their use of subscribed electronic resources. It had a beta coefficient of 0.420 and was statistically significant at $p < 0.05$. This meant that one unit increase in attitude score increased 0.420 increase score on the likelihood of using subscribed resources. It implies that respondent's positive attitude had higher chances of using subscribed electronic resources. This could be explained by the

fact that positive attitude towards subscribed electronic resources is one of the strongest correlates of usage of electronic resources. People who value the technologies in their minds, there are likely to use them. Positive attitudes are fundamental in implementing new technologies including subscribed electronic resources. This conforms to a study by Nyemezu (2022) who found that respondents with higher positive attitude had higher chances of using electronic resources.

Conclusions and Recommendations

It is well-known in the literature that subscribed electronic resources are useful among the students pursuing higher education. However, its adoption and use in higher education institution among undergraduate students is low. This study assessed students' use of electronic resources by undergraduate students using the TAM. It incorporated additional constructs such as demographic characteristics of students to determine factors influencing the use of subscribed electronic resources. Using multiple linear regression, the study found that the predictor of actual use of subscribed electronic resources was year of study, perceive usefulness and attitude. The study results provided important understanding for the library management on what determine students to use subscribe electronic resources. For example, educators who intended to promote electronic resources should ensure that it is useful. Moreover, creating awareness on usefulness of electronic resources to change their attitude is another important factor. Likewise, marketing the electronic resources through outreach programmes and information literacy are necessary for all the students.

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