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Alerting Services as Tools For Promoting The Uptake of Open Access Resources in Higher Learning Institutions. Case of the University of Zambia

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ABSTRACT

This study aimed at identifying and recommending appropriate alerting services to promote awareness and uptake of open access resources in higher learning institutions such as the University of Zambia. It identifies itself with the pragmatic paradigm; using the mixed-methods approach and a case study mixed-methods design to investigate the problem of low uptake of open access resources and how alerting services can improve the uptake. The study further applied the Unified Theory of Acceptance and Use of Technology to provide the context for examining and explaining open access usage and promotion.

The study used University of Zambia students, researchers and librarians as informants. The results reveal low usage of open access as well as alerting services in the University. To improve the uptake, the researchers suggest the use of various social media tools, vendor and Google email alerts, mobile phone sms, customised website, flashcards on Moodle and astria, SDIs and peer-to-peer sensitisations.

Keywords: Current awareness services, Alerting services, Open access resources, E-resources, Awareness, Promotion, Usage, Uptake, Students, Researchers, higher learning institutions, University of Zambia

1.1 Introduction

Libraries and librarians play a crucial role in ensuring that open access resources are accessed and used effectively through their development, advocacy and management. Librarians are important players in the promotion, integration, use and management of open access resources in academic institutions. Consequently, the quality of education, research, and academic programmes for any academic institution's intended human resource development will depend on the timely provision of the needed information resources and services to all stakeholders. This makes the availability and accessibility of information resources a fundamental characteristic of a library (Mahmud *et al,* 2020:10; Ari, 2017:61). Chigbu, Njoku and Uzoagba (2016:977) contend that to remain relevant in the contemporary age, academic libraries need to join the paradigm shift in service provision and communication methods. As such, most academic libraries in developing countries have not only prioritised their areas of expenditure towards electronic resources as opposed to print but have strategically included open access resources. According to the Budapest Open Access Initiative (BOAI) (2002), the term 'open access' refers to free and unrestricted availability of online scholarly literature accessible to all. Open access resources have fewer-to-non access restrictions compared to subscription-based information resources (Mahmud *et al,* 2020:14; Kumari, 2015:150). Consequently, open access is believed to give researchers, educators and institutions in developing countries, which often face financial challenges, an opportunity to benefit from scholarly research literature.

Despite the many opportunities open access resources provide, it is distressing to note that some higher learning and research institutions in Africa, such as the University of Zambia that have

invested in and embraced open access resources are still experiencing low uptake of online resources, which include open access resources.

As Zambia's biggest and oldest public university, the University of Zambia (UNZA) has not only grown in the number of faculties and courses offered, but also the number of students enrolled, lecturers and researchers employed. This growth is expected to correspond with the availability of information resources the University Library provides. While characterised by the challenges facing most academic libraries in developing countries, such as declining budgets, the UNZA Library has not lagged in exploiting open access content opportunities. Since 2000, the library has provided users access to electronic resources, most of which are made available through libre/gratis open access to satisfy the sundry information needs of all users. Despite these efforts, usage of e-resources including open access resources at UNZA has remained low (Kakana *et al*., 2016:7; Miyanda, 2022:129; Miyanda, 2010:52; Sakala, 2013:33).

This article reflects on a study done to identify and recommend appropriate alerting services to promote the use of open access resources and all other e-resources at UNZA. Alerting services aim to provide specific updates on current information or publications to professionals based on their subject interest. They are designed to keep specialists and professionals better informed through monitoring and communicating the latest developments in their respective fields of interest (Cabonero, Tindaan, Attabam *et al*, 2019:3; Xu, 2012:153). Since most peer-reviewed journals are now available electronically, the application of alerting services to promote library information resources comes in handy (Cabonero, Tindaan, Attabam *et al.*, 2019:3).

The study further used the UTAUT model to determine variables influencing students' and researchers' behavioural intention and usage behaviour of a technology (use of open access resources and the adoption of alerting services (Venkatesh *et al*, 2003:329).

1.2 Research problem

Open access is an essential component of higher learning education and scientific research because it makes existing research available and accessible. Its availability widens the range of resources academic libraries can provide to their users. Consequently, UNZA Library has grown its e-collection, which includes open access content, from an initial seven databases in 2000 to over 20 by 2023 to meet its users' information needs.

Despite this investment, the University has continued to experience low usage of open access resources. Miyanda (2022:129) and Kakana *et al* (2016:7) reported low daily usage of online-resources in general and the open access institutional repository by both faculty and students. Further, quarterly and annual reports on e-resource usage compiled by the UNZA Library and the annual Electronic Information for Libraries (EIFL) for 2016-2021 have revealed a low usage of e-resources in the University.

It is not clear why the usage rate has continuously been disproportionate to the growth rate of student/researcher population. Considering the high cost of e-resources, the University needs to ascertain the causes of the low usage of these resources and establish how awareness services can improve the uptake. The researcher found that no study had been conducted to establish the use of alerting services or the extent to which alerting services had been used in promoting the availability, access and use of open access resources at UNZA.

This study aimed at identifying and recommending alerting services that could be used to promote the use of open access resources and all other e-resources in the University. This can assist the University to unlock the true value of these subscriptions and prevent its library from paying for the open access resources that are not being used.

1.3 Purpose of the study

This study set out to identify and adopt specific alerting services that UNZA's library could use to promote and improve the usage of the available open access resources and all other e-resources in the University.

1.4 Research objectives

The specific objectives were to:

i. Examine the current usage status of open access resources at UNZA.

ii. Explore the existence and use of alerting services in promoting open access resources at UNZA and elsewhere.

iii. Identify alerting services that UNZA's library could use to promote open access resources and all other e-resources in the University.

1.5 Research questions

The research questions were as follows:

i. What is the current usage level of open access resources at the University of Zambia?

ii. What types of alerting services exist and are being used to promote open access and other resources at UNZA and elsewhere?

iii. How can the application of alerting services help promote access and use of open access and all other online resources at UNZA?

1.6 Study hypotheses

i. Performance expectancy determines the researchers' and students' behavioural intention and use of open access content and/or alerting services as a technology.

ii. Effort expectancy determines the researchers' and students' behavioural intention and use of open access content and alerting services as a technology.

iii. Gender, experience and specialisation moderate the effect of performance expectancy and effort expectancy on UNZA's students and researchers' behavioural intention and use of open access resources and or alerting services as a technology.

1.7 Significance of the study

Maillard (2013) indicates that the significance of a study reflects the extent to which the study contributes towards improving the existing knowledge and changing a concept or promoting a new hypothesis in a particular field of research. The significance of the current study lies in the following: despite UNZA providing scholarly open access resources from reputable publishers and databases, the usage of open access resources has remained low. This has created the need to explore strategies like alerting services to effectively promote open access content at the institution. It is envisaged that implementing the findings of this research would lead to

improved usage of not only open access content but all available online resources, thereby capitalising on the money spent on subscriptions. Other expectations are that the open access resource promotion would further help researchers actively build open access content through publishing in open access platforms such as open access journals and institutional repositories. This has the potential to increase the visibility and ranking of the University on a global scale, while achieving its goals of providing quality education, research and academic programmes for strategic human resource development needed for national development. The study may also provide the basis for further research on promoting open access resources as well as a broader understanding of the value of using open access content among users in the University.

1.8 Literature review

Marshall and Rossman (as cited in Creswell, 2014:60) reveal that the literature review, among others facilitates the sharing of the results of other studies closely related to the current study, shows ongoing research trends, filling in gaps and extending prior studies. This literature review covers relevant literature to the study to provide a framework for establishing the importance of the study and a benchmark for comparing the results with findings of other related studies.

1.8.1 Use of open access

Mahmud *et al* (2020:14), in his research on awareness and use of open access resources in higher education and scholarly research reveals that faculty and students in Bangladesh were familiar with, used and found open access resources effective in their knowledge update, teaching/learning and research because open access resources are freely available online.

Kaba and Said (2015:101) examined Al Ain University of Science and Technology (AAU) faculty members' awareness, usage and perceptions of open access resources in the Gulf Council countries. Their study shows frequent use of open access resources for teaching and research activities. The results also reveal that faculty members in Education, Engineering and IT fields used open access resources more frequently than those in Law, while female faculty members used open access resources more than male faculty members.

Shahzadi and Hussain (2019:28) explored awareness and access of open access resources by teacher educators and student teachers in Pakistan. The results showed that teacher educators used open access resources to prepare their lectures for research tasks and reflection, while student teachers used open access resources for their assignments and research tasks.

Mammo and Ngulube (2015:13), who investigated academics' use of and attitude towards open access resources in selected higher learning institutions in Ethiopia, through triangulation of qualitative and quantitative data collection methods, found that the academics' intention to use open access was motivated by the need to access scholarly literature and publishing their findings. Chisenga and Simumba (2009:118) explored the views of agricultural researchers on open access publishing in Zambia. The results indicate the researchers' basic support for open access, as they believed that open access improves the visibility and accessibility of their research, an indication of use prompted by performance expectancy (PE). Their investigation revealed a vital indicator of success for future open access initiatives in Zambia. Farzand and Qurat (2020:9) further reveals that open access model provides great opportunities not only for libraries, students, teachers, and researchers but also for universities to use and support the OA movement and have a wider visibility of their research and researchers' profiles

1.8.2 Existence and use of alerting services in promoting online resources globally

Alerting services have evolved from the selective dissemination of information reference services, originally provided by libraries, to a set of database features provided by vendors or research databases. These include may Table of Contents (TOC) services, monitoring agents (Google alerts), rooting of periodicals, forthcoming meetings, research in progress, selective dissemination of information, compiling agencies, news clipping services, and mobile alerting services (Chatterjee, 2017; Ukwoma and Onyebinama, 2021:487-488; Xu, 2012:155). Mwinyimbegu (2018:9) revealed that perusing library websites is the most important technique to promote access to and use of open educational resources in selected public university libraries in Tanzania. Other alerting services revealed were social media (Facebook, Twitter and blogs).

Naqvi (2013:108) conducted research on the awareness and use of alerting services in the College of Business, Hospitality and Tourism Studies (CBHTS) at Fiji National University's Nasinu Library. The study disclosed the following as the most popular alerting services used by staff and students: the library's website, e-mail notifications and displays of the latest books and periodicals. Similarly, a study by Uzohue and Yaya (2016:14) on the provision of alerting services by medical librarians in Nigeria revealed that alerting services provide educational resources to keep health professionals and researchers abreast with new developments. This finding shows the value of alerting services.

Meanwhile, it is worth noting that there was no known study that was conducted in Zambia and at UNZA in particular on the existence and use of alerting services in promoting electronic resources.

1.8.3 Theoretical framework

Adom, Hussein and Agyem (2018:438) state that a theoretical framework helps explain the path of a research and grounds it firmly in theoretical constructs to make research findings more meaningful and acceptable. Grant and Osanloo (as cited in Adom, Hussein and Agyem, 2018:438) add that a theory provides the structure of how a researcher defines a study philosophically, epistemologically, methodologically and analytically.

This study adopted the Unified Theory of Acceptance and Use of Technology (UTAUT) model to explain and analyse the problem of low usage of open access resources and how the application of alerting services could improve the usage at UNZA. The theory applied both deductive and inductive elements.

The UTAUT model was adopted for this research because of its explanatory power of the drivers of behavioural intention of acceptance and use of new technologies (Abbad, 2021:7210; Abdou & Jasimuddin, 2020:39; Alshammari & Rosli, 2020:15; Momani, 2020:85; Samaradiwakara & Gunawardena, 2014:29; Sejane, 2017:24; Venkatesh *et al*, 2003:425). Its structure is shown below.
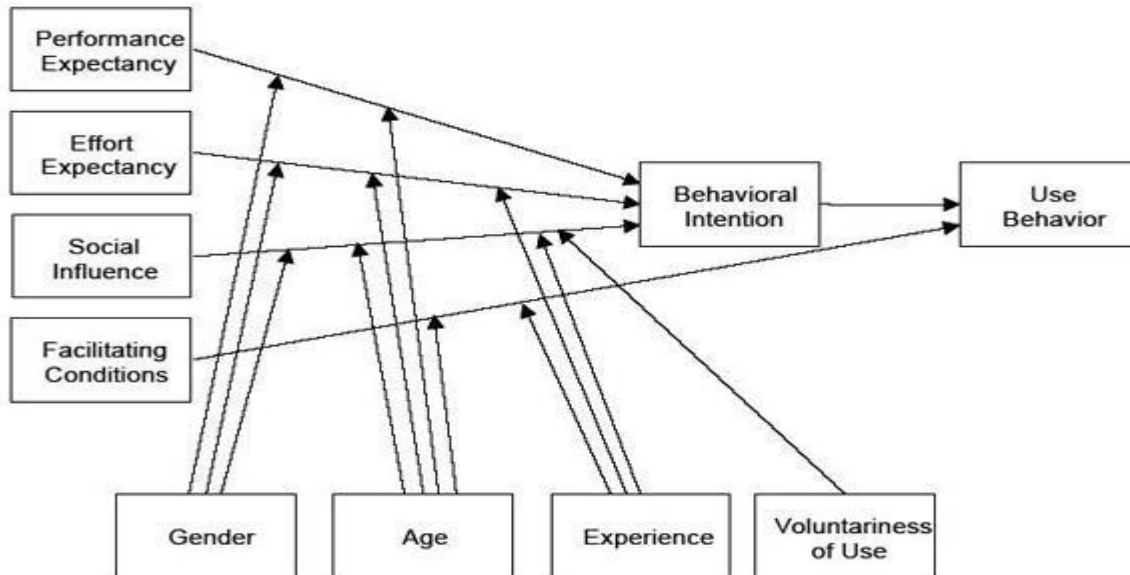
Figure 1: UTAUT structure (Venkatesh et al., 2003:447)

UTAUT model identifies four core determinants of user's behavioural intention to use a technology, namely: performance expectancy, effort expectancy, social influence and facilitating conditions and four moderators - gender, age, experience and voluntariness of use (Venkatesh *et al,* 2003:429). This study applied two UTAUT constructs (performance expectancy and effort expectancy) and three moderators (gender, experience/level of education and specialisation). Performance expectancy is the degree to which an individual believes that using a specific technology will help them achieve job performance while effort expectancy is the ease of use associated with applying a technology (Abdou & Jasimuddin, 2020:39-41; Momani, 2020:84; Sarfaraz, 2017; Venkatesh *et al,* 2003:428,447,450,451,453).

These constructs were assessed to determine whether or not they influenced researchers' and students' behavioural intention and use of open access content and or alerting services as a technology, as presented under 1.12, hypothesis testing section.

1.9   Research methodology

This study is grounded in the pragmatic paradigm and the mixed-methods approach. It took a case study-mixed methods design, comprising a multiple-case study design, sequential explanatory design and concurrent triangulation design. This was aimed at meaningful integration of qualitative and quantitative methods to yield new inferences and a better understanding of the research problem while enhancing the integrity and credibility of the findings.

Further, the study utilised a questionnaire, an interview guide, content analysis and citation analysis, which were chosen on the basis that they could produce quantitative and/or qualitative data or both. The study sample for the questionnaire was 577, 23 for the interviews, the content analysis was done on 6 databases that UNZA Library was providing access to, and the study population for the citation analysis was the 20 publications by twenty (20) prolific UNZA researchers for 2018- 2021. The selection of the questionnaire sample used stratified random sampling and simple random sampling, while other instruments used purposive and convenience sampling.

To ascertain the feasibility of the study, validity, logical sequence and appropriateness of the questions and wording within questions, the questionnaire and interview guide were pilot tested on a small sample of respondents from the study population (18 respondents for questionnaire and 5 interviews).

The data analysis was quantitatively and qualitatively done. The quantitative analysis involved descriptive and multivariate analyses using the Statistical Package for Social Sciences (SPSS)

version 22 and Microsoft Excel 2010. Qualitative data was done thematically based on research objectives.

Reliability test results (overall Cronbach's alpha value of 0.874) indicated that the scale and the relevance of each question in the questionnaire used to get valid results from the research were acceptable. Validity test results also showed a strong correlation between and among variables intended to measure the same attribute, where 224 items had a correlation significant at the 0.01 level (2-tailed) and 45 with a correlation significant at the 0.05 level (2-tailed). This shows that the questionnaire as the research instrument used to collect the most information, measured what it was expected to measure, hence, trustworthy and the data collected reliable and valid.

1.10   Presentation and discussion of the research results

The results are presented and discussed according to the research objectives and their corresponding research questions and hypotheses in sections and subsections. Where more than one data collection instrument was used to investigate a variable, the results are presented concurrently to build on, complement or substantiate the findings of another instrument. This helped in the discussion and presentation of the research results conveniently. Where the presentation of the results could not be done concurrently, the quantitative data (standardised interrogations), mainly from the questionnaire, is presented first, followed by the qualitative data (open-ended interrogations) to back the quantitative results.

1.10.1   General information

Under demographic data for the questionnaire, the interviews and citation analysis, the researchers examined respondent's category, gender, age, level of education/year of study and

school/field of specialisation. For easy computation and presentation of the demographic data, the data for the three instruments was combined, giving us a total number of 544 respondents (501 questionnaire respondents, 23 interview respondents and 20 researchers for the citation analysis).

Distribution of the respondents by category indicates that most of the respondents were students (485=89.2%), followed by researchers with a 53=49.7% representation, while librarians were the least represented (6=1.1%). Of the 485 student respondents, 475 were questionnaire participants, while 10 participated in the interviews and none was included in the citation analysis. This is because the citation analysis only involved researchers who had published in 2018. Table 1 below shows the details of the demographic information.

Table 1: Demographic data of respondents

		Research Instrument			Total
		Questionnaire	Interview guide	Citation analysis	
Category (N=544)	Student	475 (87.3%)	10 (1.9%)	0 (0%)	485 (89.2%)
	Researcher	23 (4.2%)	10 (1.8%)	20 (3.7%)	53 (9.7%)
	Librarian	3 (0.55%)	3 (0.55%)	0 (0%)	6 (1.1%)
	Total	501 (92.1%)	23 (4.2%)	20 (3.7%)	544 (100%)
Gender (N=543)	Female	211 (38.9%)	10 (1.8%)	6 (1.1%)	227 (41.8%)

	Male	289 (53.2%)	13(2.4%)	14 (2.6%)	316 (58.2%)
	Total	500 (92.1%)	23 (4.2%)	20 (3.7%)	543 (100%)
Age (N=544)	25 years and below	393 (72.2%)	3 (0.6%)	0(0%)	396 (72.8%)
	26-35 years	57 (10.5%)	4 (0.7%)	0 (0%)	61 (11.2%)
	36-45 years	27 (5.0%)	11 (2.0%)	8 (1.5%)	46 (8.5%)
	46-55 years	21 (3.9%)	3 (0.5%)	3 (0.5%)	27 (4.9%)
	56 years and above	3 (0.5%)	2 (0.4%)	9 (1.7%)	14 (2.6%)
	Total	501(92.1%)	23 (4.2%)	20 (3.7%)	544 (100%)
Level of education (N=522)	Undergraduate Degree	4 (0.8%)	1 (0.2%)	0 (0%)	5 (1.0%)
	Masters Degree	19 (3.6%)	6 (1.2%)	5(1.0%)	30 (5.7%)
	Doctorate Degree	9 (1.7%)	6 (1.2%)	15 (2.8%)	30 (5.7%)
	1st year	67 (12.8%)	2 (0.4%)	0 (0%)	69 (13.2%)
	2nd Year	148 (28.3%)	6 (1.2%)	0 (0%)	154 (29.5%)
	3rd Year	99 (19.0%)	2 (0.4%)	0 (0%)	101(19.4%)
	4th Year	107 (20.5%)	0 (0%)	0 (0%)	107 (20.5%)
	5th Year	15 (2.9%)	0 (0%)	0 (0%)	15 (2.9%)
	6th year	1 (0.2%)	0 (0%)	0 (0%)	1 (0.2%)
	7th year	10 (1.9%)	0 (0%)	0 (0%)	10 (1.9%)

	Total	479 (91.8%)	23 (4.4%)	20 (3.8%)	522 (100%)
School (N=533)	Agricultural Sciences	6 (1.1%)	1 (0.2%)	0 (0%)	7 (1.3%)
	Nursing	16 (3.0%)	0 (0%)	0 (0%)	16 (3.0%)
	Public Health	5 (0.9%)	0 (0%)	3(0.6%)	8 (1.5%)
	Health Sciences	19 (3.6%)	1 (0.2%)	0 (0%)	20 (3.8%)
	Human Medicine	27 (5.0%)	1 (0.2%)	1 (0.2%)	29 (5.4%)
	Education	152 (28.5%)	6 (1.1%)	4 (0.8%)	162 (30.4%)
	Engineering	29 (5.4%)	2 (0.4%)	2 (0.4%)	33 (6.2%)
	Law	12 (2.2%)	1 (0.2%)	0 (0%)	13 (2.4%)
	Humanities and Social Sciences	152 (28.5%)	4 (0.8%)	4 (0.7%)	160 (30.0%)
	Mines	8 (1.5%)	0 (0%)	0 (0%)	8 (1.5%)
	Natural Sciences	53 (9.9%)	3 (0.6%)	2 (0.4%)	58 (10.9%)
	Veterinary Medicine	8 (1.5%)	1 (0.2%)	4 (0.7%)	13 (2.4%)
	University Library	3 (0.6%)	3 (0.6%)	0 (0%)	6 (1.2%)
	Total	490 (91.9%)	23 (4.3%)	20 (3.8%)	533 (0%)

Meanwhile, the distribution of respondents by gender recorded 543 total responses, as one questionnaire respondent did not answer this question. The results show 316 (58.2%) male respondents compared to 227 (41.8%) female respondents. The trend of having more male than

female participants is noted across all the three research instruments, although it is higher for the citation analysis, as illustrated in Table 1 above. This shows the need to encourage and engage more female employees and increase female student enrollments to improve female involvement at UNZA.

The ages of the respondents ranged between 25 and 56 years. The results revealed that the majority of the respondents for the three research instruments were between 25 years and below, representing 72.8%, followed by 26-35 years (11.2%), while the category for 56 years and above was the least represented with 2.6%. The number of respondents declined as the age progressed.

The assessment of the respondents' level of education reveal five undergraduate degree holders, 30 with masters' degree, and 30 PhD holders, while the rest (457) were still pursuing their first or a postgraduate degree and 22 respondents did not answer this question and were not included in the analysis. Of the 457 respondents who were in school, the majority was in the second year (154), followed by those in the fourth year (107) then the third year (101) and one in the sixth year. Of the 485 total students recorded, 449 were pursuing an undergraduate degree, while 36 were enrolled in postgraduate studies.

The distribution of respondents according to schools recorded 533 valid responses. Eleven questionnaire respondents did not answer and were not counted in the analysis. The results revealed that the School of Education had the highest number of respondents with a 30.4% representation, followed by the School of Humanities and Social Sciences with 30%, then the School of Natural Sciences with 10.9%. The University's library and the School of Agricultural Sciences had the least participants with 1.2% and 1.3%, respectively.

The general information for the databases analysed in the content analysis indicates that 3 subscription-based databases offered a hybrid type of open access content while the 3 EIFL-based databases offered libre and/or gratis open access resources.

Based on the demographic data results, it can be postulated that the respondents' profile data was useful for the attainment of valid research results, especially in the applicability of the theoretical model to the results of the study. This brought out critical information about the study units, which helped explain why specific results were observed and not others.

1.10.2 Usage of open access resources

The usage of open access resources was assessed using questionnaires, interviews, content analysis and citation analysis. The questionnaire and interview results show that less than half (46%) of the respondents used online resources, including open access content, while more than half (54%) did not use them. Thirteen questionnaire respondents gave no response and were not included in the final analysis. Figure 1 below shows the results.
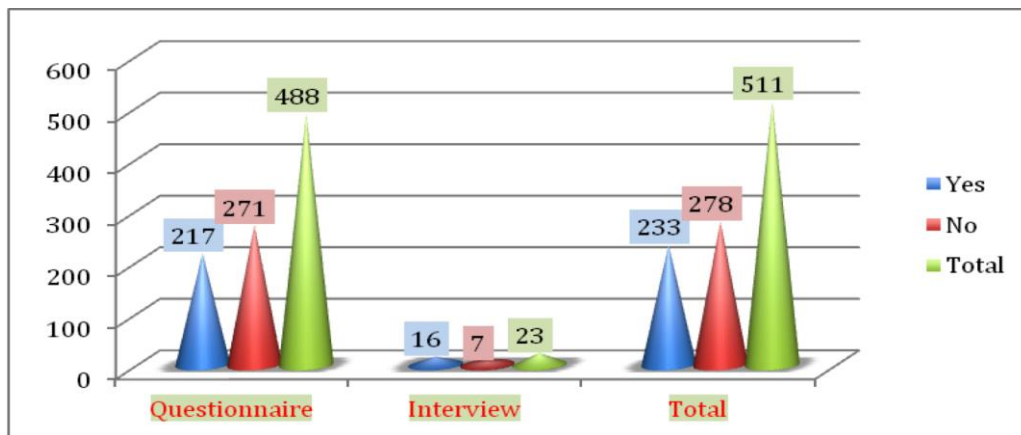

Figure 1: Open access usage (N=511)

Based on these results above, we can deduce that using online resources is still a challenge at

UNZA. These results, confirm the findings of earlier research that revealed low usage of online resources by students and faculty at UNZA (Kakana *et al*, 2016:7; Miyanda 2022: 129; Miyanda, 2010:52). This continuous low usage of online resources may point to other unresolved problems that require a different approach, such as using alerting services to promote awareness and improve open access usage.

Meanwhile, the 2018 annual usage statistics, as revealed by the content analysis, show ScienceDirect with the highest usage, followed by JSTOR, while Royal Society was the least used (see Figure 2).
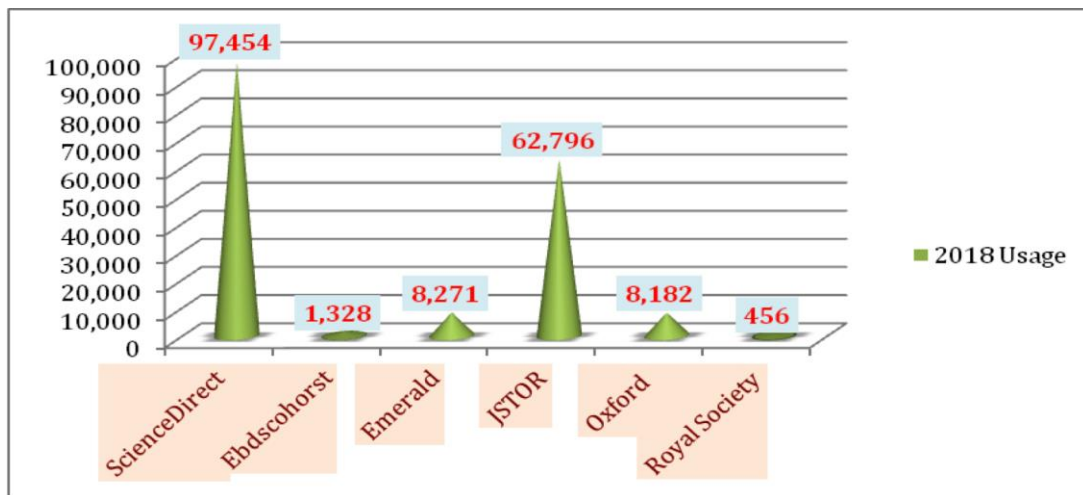

Figure 2: 2018 usage statistics of the six databases

The results of the citation analysis further reveal a generally high usage of openly accessible resources. More than 50% of the total online references of each publication analysed were openly accessible. These resources were not fully open access but had been made openly available by the authors through other academic social networks or platforms such as Academia.edu, LinkedIn, PubMed, Biomed Central, Research Gate and Google Scholar (probably with the permission of the publishers). The citation analysis also revealed that older

lecturers mostly used print information resources, while younger academics are interested in exploring online resources. These younger academics were the most active users of e-resources.

1.10.3 The existing alerting services at UNZA

This part covered the awareness services used by UNZA Library to provide updates to users and those used by students and researchers to get updates on available information resources from any academic network/platform or database. The questionnaire, the interview and content analysis data were used to assess the existing alerting services.

The questionnaire results show a generally small number of respondents using current awareness services at UNZA, with the library website being the most known alerting service (29.5%) while journal alerts were the least known alerting service among UNZA students and researchers, recording 8.1%. It should be noted that each item had a different valid total response based on the number of respondents that answered that particular question. Figure 3 below has more detail.

Figure 3: Existing current awareness services at UNZA

Meanwhile, the questionnaire and interviews identified other alerting services on use that were not on the list. These include Facebook, the Library's Online Public Access Catalogue (OPAC), posters and notices, students' WhatsApp study groups, direct interaction with librarians, fellow students, and social media platforms (Academia.edu, Research Gate and LinkedIn). One librarian interviewed indicated that they verbally sensitised users on current publications when they visit the library, during library orientation, and at any other educational tours conducted.

1.10.4 Other experiences with current awareness services

The researcher sought to understand any other updates students and researchers were unknowingly exposed to. When the questionnaire respondents who had earlier indicated that they were aware of the available open access at the University were asked how they became aware of these sources, the results show that most respondents learnt about open access resources through friends, UNZA website and posters/fliers. Their responses are recorded in Figure 4 below.
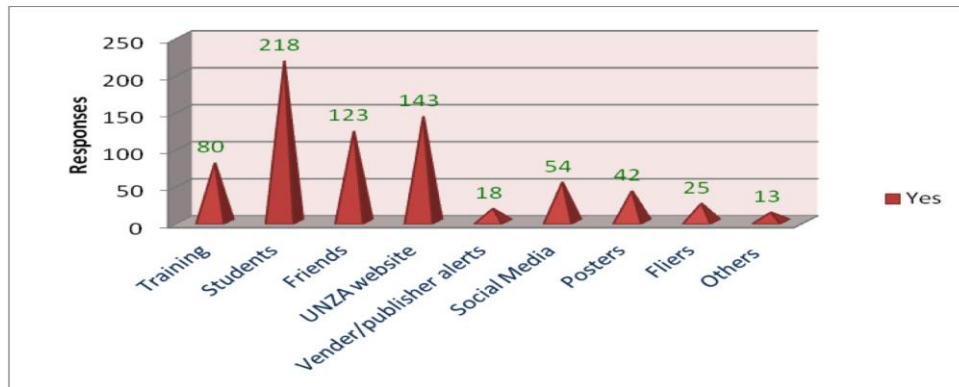

Figure 4: How respondents became aware of open access availability

The interviews and content analysis further suggest that most users of online resources had experiences with certain current awareness services such as vendor/publisher alerts, Google alerts, email alerts, publisher catalogues, newsletters, academic research cites (LinkedIn,

Academia.edu, Mendeley, Researchgate) social media and personal visits to the databases. However, these users were not aware of this experience. The findings from the content analysis clearly show that all the seven databases assessed offered various alerting services such as live chats, vendor/publisher alerts in the form of email alerts and RSS. The databases also used social medial tools like Facebook, Twitter, Instagram, YouTube and LinkedIn as revealed in Table 2 below.

Table 2: Alerts offered by the six databases analysed

	TOC	Email alerts	Social media	Live chat	RSS feed	Search alerts	New issue or article alerts	Newsletter
EbscoHost	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Emerald		Yes	Yes			Yes		
JSTOR		Yes	Yes	Yes	Yes			Yes
Oxford	Yes	Yes	Yes	Yes	Yes	Yes		Yes
Royal Society	Yes	Yes	Yes		Yes	Yes	Yes	Yes
ScienceDirect	Yes	Yes	Yes		Yes	Yes		

The users who used these databases must have received an email to alert them of related articles based on their search history. Interviewees who indicated that they would receive email alerts except they mostly ignored or deleted them confirmed this. Those that opened the emails attested that the alerts were very useful because they pointed them to more research related to their areas of interest. Since the application of the above alerting services is not exhaustive, there is need to

apply them on a large scale and in an effective manner to experience a huge impact on the awareness and usage of open access resources at the University. Since alerting services are meant to support and sustain research, education and science, their effective use would improve research, education and science.

Similarly, Abdullah *et al* (2020:9) revealed that most of the faculties in Bangladesh often used "Academic or professional Platforms such as LinkedIn, Researchgate, Academia.edu whilst students mostly used social networking sites i.e. Facebook, twitter to get updates on open Access resources

1.11 Appropriate current awareness services and other measures to promote open access resources and other e-resources at the University of Zambia

1.11.1 Recommended current awareness services and their impact on the use of open access

To assess this aspect, the researchers used the questionnaire, interviews and content analysis data. The researcher asked the questionnaire respondents to indicate information update methods they felt would help to easily and effectively reach students and researchers. Each sub-question had a different total because the respondents were allowed to choose several options and non-responses were recoded to missing value and were not included in the analysis. The results are presented in Table 3 below.

Table 3: Recommended current awareness services by respondents

	Yes	No	Total valid

			responses
Social media	397 (90.9%)	40(9.1%)	437 (100%)
Email & RSS	397 (90.0%)	44(10.0%)	441 (100%)
Google alerts	304(77.6%)	88(22.4%)	392 (100%)
SDI	257(69.1%)	115(30.9%)	372 (100%)
Vendor/pub alerts	172(48.9%)	180(51.1%)	352 (100%)
TOCs	152(45.0%)	186(55.0%)	338 (100%)
Others	41(8.2%)	460(91.8%)	501 (100%)

The results in Table 3 above show that social media and email/RSS alerts were the most recommended current awareness services to be adopted by the University, each recording 90% of the responses. Using social media where students and researchers are already engaged would easily help to promote open access resources. Researchers also depend on emails for communication, hence, emails would make a good marketing tool as long as the users realise the benefits of using these services. The third alerting service recommended was Google alerts with 304 (78%) and SDI with 257 (69%) responses. Google Scholar would promote open access use through email alerts, while SDI would provide selected lists directly to students and researchers. The other services received less than 50% responses such as WhatsApp, mobile phone text messages/alerts, UNZA radio, notice boards and the online student portal.

Meanwhile, other unique awareness services recommended in the interviews include mobile phone text/Short Message Services (SMS) alerts, flashcards on Moodle, libGuide, library website, electronic billboards and customised online student portals (Student Information System, Moodle and Astria). The introduction or increased use of alerting services among

UNZA's students and researchers is likely to impact the uptake of open access resources at UNZA positively.

The researcher's justification for the recommendation of these services was based on their capacity to cater for a large user population and ease of use. Furthermore, since most of them are web-based, they can easily generate automatic alerts based on specific user research interests. Considering that most UNZA's researchers are not regular users of online resources and are therefore, not likely to create researcher profiles, the use of such alerting services would fill this information gap.

Now more than ever, it is of utmost importance that the University Library is encouraged to strategically introduce more alerting services identified to promote the use of open access resources while strengthening those already in use.

1.11.2 Other strategies recommended for improving open access uptake

The researcher further sought to establish anything else the respondents felt would help improve the usage of open access resources and all other e-resources at the University. These may not necessarily be awareness services. At this level, the qualitative data from the questionnaire and interviews were merged thematically for easy presentation in the respondents' order of preference.

Most respondents suggested increased and regular open access awareness, promotions and sensitisation programmes to educate users (students and researchers) on the academic value of open access resources. Promotions could take various forms including weekly alerts based on user profiles and subject interests, open access week advocacy, UNZA radio, peer-to-peer

training, providing posters and fliers in strategic areas and sharing guides or short videos on how to access open access resources with a provision for feedback. Emphasising the need to promote the use of open access resources, one interviewee said that "open access must be promoted and everyone must take part," while another said, "I have no idea what open access is all about; hence, it should be promoted among us, students." (Interviews, R4 & R10 respectively)

The second strategy suggested was to improve the information search skills of the students and researchers through school curriculum integrated training programme. Training should also involve skills transfer on evaluating the quality of open access resources in academia. Other suggestions were to make open access resources use mandatory for students, linking the e-resources page to all student platforms such as the e-learning platforms (Moodle and Astria) and other social media hubs, the student information system (SIS) and the University portal for easy reach and awareness. There should be an establishment of explicit open access policies to govern the use of open access resources and increased opening hours of computer laboratories.

While all the above are required, much more is needed to change the negative perception of researchers and students on the quality, vastness, timeliness and easy access of open access content in academia.

1.12 Hypothesis testing using the UTAUT constructs

The hypothesis testing was done using factor analysis and binary logistic regression analysis to determine the influence of UTAUT's performance expectancy and effort expectancy on intention and usage behaviour of a technology (open access resources and/or alerting services. Since open access resources and alerting services are both technologies, the analysis applied to both as

already indicated above.

The test results of the factor analysis revealed the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy of 0.694, the Bartlett's Test of sphericity (approx. Chi-square) 1709.786 at 0.001, df =595, significance (sig.) level. The table with the results could not be presented here due to its bulkiness. The factor analysis results yielded two constructs with 10 variables. With a minimum coefficient set at 0.5, the factor loadings of the items ranged between 0.5 and 0.8. Discriminate validity was applied to ensure that all the items included had no cross-loading exceeding 0.5. This way, all items belonging to the same construct loaded highly in their constructs compared to their loadings in other constructs.

Secondly, a binary logistic regression analysis was conducted in two phases. 1. To determine factors likely to influence UNZA researchers' and students' behavioural intention to use open access resources and/or alerting services as a technology. 2. To assess factors that influenced the researchers' and students' actual usage of the open access resources and\or the application of alerting services at the University.

The results of the determinants of students' and researchers' behavioural intention to use a technology show the Omnibus Test of Model Coefficient statistically significant at $X^2 = 53.913$, 5 degree of freedom and $p<0.001$). The model summary results revealed a -2 Log Likelihood of 147.801 with 0.309 Cox & Snell R Square and 0.412 Nagelkerke R Square. The Hosmer and Lemeshow test results were found insignificant at $X^2 = 6.152$, 8 degree of freedom and p-value of 0.630. With the p -value more than the set 0.05 (5%) significance level is an indication that the model does fit the data and could be interpreted further. The model summary further shows that the model correctly explains or estimates 75.3% of the predictions on technology use.

The results in the first phase reveal that both performance expectancy and effort expectancy had a significant effect on behavioural intention and use of open access resources and/or application of alerting services as a technology. Performance expectancy was significant at 0.001, by B=-0.834, with the Exponentiated odds ratio of 0.434. Similarly, effort expectancy recorded B=0.954, *p*-value of 0.001 with the Exponentiated odds ratio of 0.385, while, there was no moderating effect of the two moderators (experience, specialisation and gender) on behavioural intention to use open access resources and/or alerting services.

The second phase results recorded the Omnibus Test of Model Coefficients statistically significant at X^2=63.909, 5 degree of freedom and *p*-value of 0.001. The Model summary results revealed a -2 Log Likelihood of 109.459, Cox & Snell R Square of 0.355 and Nagelkerke R Square of 0.510. The Hosmer-Lemeshow Test was also found significant at X^2 = 5.526, 8 degree of freedom and *p*-value of 0.700. The model correctly predicted 84.2% of the predictions on technology use.

These results suggest that performance expectancy and effort expectancy significantly influenced students' and researchers' usage behaviour of a technology, in this case, open access resources and/or alerting services. Performance expectancy recorded B=-0.789, *p*-value of 0.002 and Exp(B)= 0.454, while effort expectancy was significant at B= 0.754, *p*-value of 0.004 with the Exp(B)= 2.126. Furthermore, the results show that performance expectancy was significantly moderated by experience (level of education/year of study) at *p*-value 0.007 and Exponentiated odds ratio of 0.435, while effort expectancy was moderated by gender and specialisation both at *p*-value less than 0.05.

1.13 Summary

This study looked at factors likely to influence the students' and researchers' behavioural intention and usage behaviour to use open access resources and/or alerting services as a technology at UNZA. The study revealed low to average awareness and usage levels of these resources and services by most students and researchers. Most students depend on lecture notes and recommended readings, while researchers mostly, used print resources. It was further noted that very few students and researchers were aware of or use alerting services for information updates.

However, users strongly believe that alerting services would keep students and researchers updated with the new research in their fields of specialisation. As such, the study recommends applying the following awareness services to help improve the uptake of these resources: social media platforms (WhatsApp groups, Facebook, Twitter), email alerts, RSS, Google alerts, SDIs, Google alerts, customised websites and students e-learning portals (Moodle and Astria), mobile phone alerts/SMS.

Additionally, the research suggests that the research model used in the study correctly explains or estimates 75.3% and 84.2% of the predictions on the students' and researchers' behavioural intention and usage behaviour to use open access resources and/or application of alerting services, respectively. The results further reveal that performance expectancy and effort expectancy significantly influenced the students' and researchers' behavioural intention as well as usage behaviour to use open access and/or alerting services. Performance expectancy is moderated by experience, while effort expectancy is moderate by gender and specialisation.

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