



Conference proceeding



Making Academic Electronic Information Resources Accessible in a Comfort Zone: Exploring Students' Awareness of Resources at Ashesi University Warren Library

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Abstract

The Ashesi University Warren Library has, over the years, applied innovative technologies and creativity in making academic information resources accessible to students. The library's resources are accessed through webpages, URLs and QR codes on laptops and handheld devices, such as Android phones, iPads and Tablets and in the users' comfort zones. This paper examines students' awareness, use and experiences using the library's resources, sources of awareness, and suggestions for improved awareness-creation strategies. Monthly statistics of students' use of the OPAC and E-Library systems show lower usage as against student population. This is a widespread problem for academic libraries. The researcher used the constructivism paradigm with qualitative investigation approach and interview survey based on the study variables. Convenience sampling of the nonprobability sampling techniques was used to select six participants who were interviewed based on their consent and readiness to participate in the research. The descriptive design was used to analyse the collected user statistics and interview data presented in tables, figures and word cloud. The study was interpretive and subject to the students' responses on their awareness, use and experience of using academic information resources. The responses were not generalised to the entire university population but based on the opinions of the students interviewed. The findings are that ten resources were used out of the 30 available resources. Three resources were mostly used and four were less used. The respondents mentioned that they are aware of the academic information resources, but two out of those interviewed mentioned that they are unaware of all the resources. The respondents mentioned that they use the subscribed resources, but two of them use other course-related resources that are unsubscribed. The respondents mentioned that their experiences of using the resources were satisfactory, but two of them had unsatisfactory experiences. The findings suggest strategies to expand the scope of awareness creation of the subscribed resources for very high user statistics, experiences and satisfaction. The study will add to knowledge on the best strategies to create awareness of the subscribed academic information resources.

Keywords: Technology, Systems, Academic Library, Ashesi University, Academic information, Resources, Students, Awareness, Use

Introduction

The Ashesi University Warren Library has subscribed to thirty academic electronic information resources; still adding, hosting, making them available and accessible on outsourced remote systems. The purpose is to make the resources easily

accessible in the users' comfort zone. The study explored students' awareness of subscribed academic electronic information resources that are accessible in their comfort zones and at the Ashesi University Warren Library. Academic electronic information resources are easily, and speedily identified, located

and retrieved with a single search within the many structured layers of online resources. Library staff are involved in technology duties, making the information resources visible and accessible through electronic systems and software. The main goals are to meet the technology information needs of the present-day user and to support academic work with credible, authentic and relevant information resources (Dadzie, 2005; Ankamah, et al, 2024). The academic information resources, systems and tools for access are expensive investments the library has made and therefore wants to ensure that students are receiving the maximum benefit from the investment, and it is getting good value for money. The study explored strategies for creating awareness to maximise use of information resources. Awareness allows extensive use of the credible, authentic, and relevant academic information resources instead of using the loads of information provided on the internet. Awareness builds up confidence and enables users to use the relevant resources. High level of awareness, good user experience and satisfactory usage statistics provide value for money and are essential to academic information resources providers.

A student's good experience using academic information resources includes easily and speedily searching through the many layers of the resources, enhancement of learning and research activities. Academic information resources enhance learning and research (Adeniran, 2013), and efficiency in the creation and sharing of knowledge. The study provides literature on academic information resources (open or proprietary) accessible within the student's comfort zone through technology systems and software that support use, awareness creation strategies, usage and experiences of use. Concerns such as the use and unuse, awareness and unawareness of the resources, satisfaction and dissatisfaction using the resources, as well as the way forward in enabling utilisation of the resources have been raised by librarians who subscribe to the resources. The findings on user awareness, use of the resources and experiences of use will bridge the research and knowledge gap in awareness creation and use of academic information resources that are accessible in the user's comfort zone. Investigating and knowing the best awareness creation strategies will help address low information resource use. According to Lata and Sonkar (2021), creating awareness of using academic information resources is vital for the utilisation of the resources.

Aims of the Study

This research aims to;

1. ascertain students' awareness, use and experiences of using academic resources.
2. find out the best practices of awareness creation in academic libraries.
3. bridge the knowledge gap of best practices for awareness creation of academic resources.

Research Questions

1. Are students aware of the library's academic electronic information resources?
2. Which resources are students aware of or not aware of?
3. Which resources do students use or not use?
4. Why do students not use certain resources?
5. What are students' experiences in using academic information resources?
6. What are the best practices of awareness creation of academic electronic information resources?

Rationale of the Research

The development of technology has led to innovation and creativity in the format, delivery and access to academic information resources. Integrated Library Systems (ILS) and electronic platforms quickly store, access and disseminate information with a click of the button. Most academic libraries have adopted emerging technology services. They provide digital information formats, such as electronic journal articles, books, theses, dissertations, projects, news articles and magazines hosted on open and subscribed aggregator platforms. For example, institutional repositories house students' theses, dissertations, projects and Faculty research. These resources are accessed under self-service conditions within and outside the walls of the library with the library staff's administrative support. The digital platforms enable fast, single, and result-oriented searches where millions of pieces of published information can be refined to the purpose and needs of students. However, usage statistics compared to the student population over time are not impressive. The rationale for this research is to ascertain the level of awareness of the academic information resources and usage by the Ashesi University students and to find out the best strategies to create awareness that will lead to improved usage and value for money. The Ashesi University Warren Library users are primarily students, Faculty and administrative staff. The focus of this study is on the students. The research explores whether the students are aware or unaware, how they got to know

about the resources, whether they use the resources or not, and suggests best practices for creating awareness of the resources. The findings will improve awareness creation practices of academic libraries in the efforts of making academic electronic information resources accessible in the users' comfort zone. Also, the findings will help bridge the research and knowledge gap in best practices for awareness creation of academic electronic information resources and will provide data upon which further studies on awareness creation strategies could be conducted in other academic libraries within the Consortium of Academic and Research Libraries in Ghana (CARLIGH).

Literature Review

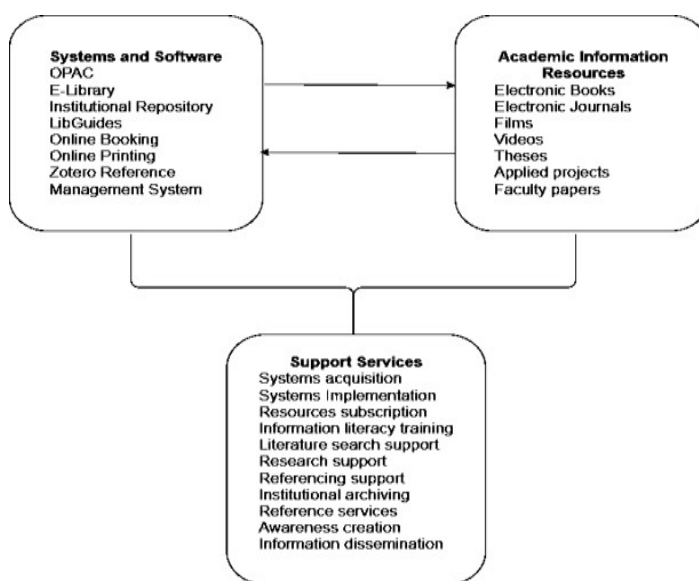
Information resources are changing from print to electronic, and technology is used extensively to access information and provide services. However, the onus is on academic libraries to provide systems, electronic information resources, and support services in that direction to develop resource provision from print to electronic. The academic library system of information provision actively supports students in academic information resources use. It is purported to achieve the primary goal of providing adequate and required support for teaching, learning, and research with the requisite digital content. It also aims at boosting academic and intellectual resources in pursuit of Faculty teaching, student learning, research and collaboration for knowledge creation and dissemination. Faculty and students are often supported in using academic information resources to contribute to creating knowledge and benefit from information dissemination online. The tremendous demand for electronic information resources usage in a comfort zone led to the digitalisation of library functions and the digitisation of resources and services (Dadzie & van der Walt, 2015). Therefore, the efforts of library staff of the Ashesi University Warren Library in providing academic electronic information resources (ebooks and ejournals) in the comfort zone of students must be beneficial.

The Context of Ashesi University Warren Library

Many innovations have occurred at the Ashesi University Warren Library since its inception. Adopting collaborative learning and research technologies is geared toward Faculty teaching, student learning and research. The provision of academic information resources to the Ashesi University community is vital to students' development. The satisfaction of students'

and Faculty's needs for academic information resources is the priority of the library staff who ensure the acquisition and implementation of technologies that support user services. The diagram below depicts the available technology systems, academic information resources and support services in the Warren Library.

Diagram 1
Conceptual Framework



Systems and Software

The Ashesi University Warren Library has an Online Public Access Catalogue (OPAC), Electronic Library (E-library), Institutional Repository (IR), Libguides and seminar room booking systems. Online booking systems, printing and Zotero reference management software are available to users. The library OPAC consolidates all the systems, academic resources and self-services, making them accessible and functional on one platform. Resources like ebooks, ejournal databases, films and videos that relate to the university's programs and courses are also available.

The era when knowledge is solely found in print books and on library shelves is gradually facing out. Abundant technology and digital content support learning and social aspects of education. Libraries use integrated systems and software to quickly process and retrieve bibliography records of print and electronic information. Also, electronic information is processed and stored faster for easy sharing through electronic databases hosted on technology-based systems and software. Libraries ensure information resources are available to students through multifaceted digital platforms, such as electronic journal databases, open ebooks and aggregator/proprietary platforms. The

resources are easily searchable with connection to the internet at no extra cost to students. The use of digital information retrieval and dissemination systems is significant to the access and use of academic information resources (Francis, 2024).

Academic Information Resources

Information resources are in print and electronic formats. The academic information resources include textbooks, journals, encyclopaedias, dictionaries, theses, newspapers, websites, and databases. The electronic information format was developed from CD-ROM databases, pen drives, web servers and cloud space. The Ashesi University Warren Library information resources include electronic books, journal articles, films, videos, students' theses and applied projects, and Faculty research papers. These are hosted on the library integrated system (Koha) and are accessible to users through the library OPAC, which provides a user interface for the services. Electronic books, films, videos, and journal databases are hosted on the E-library (RemoteXs/MyLoft) system. In contrast, students' theses, applied projects and Faculty research articles are hosted on the institutional repository. The ebooks are Baobab, EBSCOhost, ProQuest, and Buku, while the electronic journal articles on service provider databases, are ACM Digital Library, Cambridge Core, Core CREDO Reference, DeGruyter Directory of Open Access Journals, Duke University Press, EBSCOhost, ElgarOnline, Emerald, IEEE, Institute of Physics Journals, JSTOR, the New York Times, Oxford English Dictionary Online, Oxford Handbooks Online, Oxford Journals Online, Oxford Reference Online, Oxford Research Encyclopedia Online, Project Muse, Sage, Taylor & Francis Online, Wiley Online Library, the World Bank eLibrary and the Research4Life resources (AGORA, ARDI, GOALI, HINARI, GOALI, OARE).

Many of these academic electronic information resources are accessed through paid and subscribed databases from service providers, and the electronic books are subscribed to through aggregator and publisher platforms; while a few are open sources, such as Faculty research articles and students' theses and dissertations in the institutional repository. Some academic libraries digitise old print materials such as periodicals, novels and textbooks with permission from publishers and authors, making them open access. The digitisation process conforms to copyright requirements and the use of emerging technological services in academic libraries, making some academic

electronic information resources open and others proprietary.

Use of Academic Electronic Information Resources

Information is used in print and electronic formats for various purposes. Information is generally used for various activities and purposes, such as political, social, educational, economic, religious, and recreational. In the educational sector, information is used for academic purposes; for teaching, learning and research. Therefore, academic information is used in the academic field for academic purposes. Academic electronic information resources are credible, authentic, reliable and timely for educational and scholarly works. Academic information resources promote teaching, learning, research and innovation (Adeniran, 2013). They also encourage knowledge creation, sharing, discovery and aid in academic endeavours. Academic information resources are used mainly by Faculty, Researchers and students who are in the majority, and are the beneficiaries of academic electronic information resources and university products. Academic information resources are used to transform, add to existing knowledge, develop new knowledge, solve problems, manage and make decisions.

Awareness of Academic Electronic Information Resources

Awareness of academic electronic information resources is vital to scholarly work in universities. These resources are needed throughout students' academic journey for the best productivity. Awareness of academic information resources builds users' confidence to use them. Knowledge of the availability of academic information resources influences users' ability to use them. Therefore, academic information resources are unutilised, and worthless without awareness creation. Some studies on awareness of academic information resources and usage (Frempong- Kore & Samuel, 2024) indicate that academic libraries should strengthen awareness creation strategies for information resources use, either paid or open subscriptions. Most students rely heavily on search engines for general searches that provide them with billions of information loaded on the internet. They struggle to find relevant information required for academic work despite the numerous academic resources at their disposal and accessible within their comfort zone. The justification for the high cost of investments in the subscriptions of academic electronic information resources cannot be convincing

if the resources are barely utilised. The enforcement of the Ghana Tertiary Education Commission (GTEC) in acquiring the resources for institutional accreditation becomes just a caveat for institutional accreditation if the resources are not used. The use of the resources by the students is an issue of concern to the library staff who take care of the subscriptions and host the resources on expensive access platforms to ensure that students use them (Adwoa Kwegyiriba et al., 2021).

Lack of awareness of academic information resources provides no benefits to users. Awareness of the academic information resources includes display and giveaway of marketing and promotional materials, such as pull-up banners, stickers, bookmarks, library brochures, lanyards, notebooks and pens, to mention a few. Also, some materials are branded with academic information resources, which alert and remind students to use the resources. Other existing awareness-creation strategies are library activities, such as outreach programs, library week celebrations, reading challenges and use of social media tools (Mensah & Bosire Onyancha, 2022) to propagate academic information resources. There needs to be more than yearly library orientation sessions to get students to become aware of and use electronic resources with the requisite searching skills to locate what they want (Thakor, 2023). In addition, class presentations, information literacy courses and searching skills support help in directing students to use the resources. Teaching information literacy skills to students to efficiently navigate through electronic resources and create awareness for use are very relevant. The Ashesi University Warren Library provides all the above-mentioned services and creates awareness of the available academic information resources with the hope of attaining maximum use and value for subscription fees. Other avenues and strategies of awareness creation are being sought from students through this research to increase the use of academic electronic information resources. In all, knowing how to search for relevant information is vital to using academic information resources. Students avoid using the required subscribed resources due to lack of searching skills. Information literacy skills are developed among students through training to support their ability to navigate through the many layers of information resources to find appropriate information they need to use.

Through information literacy training, users acquire the requisite literature search and information retrieval skills, information evaluation, and

referencing skills that improve learning and research. Information literacy skills is about having knowledge of what information is needed, where and how to find information, and how to evaluate information for authentic, credible and fair use. Information literacy skills are taught in the universities to enable students to know how to identify their information needs, locate, search, find and use information judiciously as required by the copyright law of fair use and intellectual property protection. Academic libraries provide information literacy skills support to ensure that academic information resources are accessed and used appropriately in the comfort zones of their clientele (N.B. & Varghese, 2021; Association, 2000; Ozor & Toner, 2022; Adle, 2023; Okeji et al., 2020).

User Experiences Using Academic Information Resources

The use of modern technologies has transformed the access and retrieval of information resources, which gives users satisfactory experiences in the use of information (Smith, 2011). User experience in accessing and retrieving academic information resources depends on the availability and accessibility of the information resources. The best interactive user experience of accessing digital information resources depends much on excellent internet connectivity, bandwidth allowance and speed. User experience in accessing the open and proprietary information resources in a comfort zone is expected to improve. Some expected user experiences are easy searching and finding information to enhance learning and research and speedily locating electronic resources. Digital information resources are easily, speedily, and timely identified, located, and retrieved with expertise in searching. Technology devices and internet connectivity facilitate easy and fast searching and locating academic information resources which lead to user satisfactory experiences (Birdsall, 2010). Navigating through the resources with a click of the button and a single search produces millions of results that can be refined to the specific results needed. Skillful search using the advanced search and Boolean operators provides satisfactory results. Scholarly communication and research activities are enhanced resulting in excellent output. There is efficient use of the information resources for academic work and scholarly communication.

Support Services

The academic library provides information support services for the academic community to fulfil the academic library's purpose, vision and mission. Providing information resources, easy access, and research support in the digital environment is a critical role of academic library staff. The digital information resources used with electronic facilities require digital experts support services from the library staff. Technology and innovations have improved the support services provided by libraries, including introducing digital and physical collaborative learning spaces with relevant information resources (Singh & Madhusudhan, 2022; Oliveira, 2018). Support services of the academic library and information services profession are mostly online following the introduction of technology for digitalisation and digitisation of library systems and resources. The digital library environment provides technological support for accessing and using digital spaces (systems) and academic information resources. Libraries present digital information resources to users through digital media, such as institutional and library websites, service provider websites, publishers and aggregator platforms (Akinola, 2022). Information resources are organised in the digital space for time-oriented searching, quickly identifying, locating, and retrieving. Information science professionals provide support in navigating and evaluating the contents of digital information resources where a search provides a pool of information resources. An example is how Google Scholar search pools together many layers of information resources, and points to the resources that have them. This helps to know the sources of the information resources, their appropriateness and credibility.

Many support services provided by academic libraries include collection management, lending, reference, dissemination of information, information literacy instruction, and research orientation, administration and management support. Expertise and guidance services in the digital search for information resources, literature search, scholarly communication and referencing, plagiarism check, copyright and intellectual property rights and protection, document delivery, inter-library loan, and current awareness are more support services libraries render to their patrons. Other support services are reprography services, such as printing, photocopying, scanning, bindery and digitization.

Digital projects and emerging social media technologies are used to communicate with users.

Most social media sites, such as email, WhatsApp, TikTok, Instagram, and Facebook are used as the media of communication, resource promotion, marketing, and response to service inquiries. Most libraries and information professionals in the academic environment are information and communication technology experts who assist in searching, retrieving and using digital information (Mensah & Bosire Onyancha, 2022; Wexelbaum, 2016). Guidance is provided when navigating through the many layers of digital informational resources.

In addition to those mentioned earlier, the support services offered by the Ashesi University Warren Library include the implementation of digital systems through which the information resources are accessed. The library supports digital content acquisition and subscription, literature search, researching and referencing skills training, self-publishing and archiving on the Institutional Repository, circulation and reference services and awareness creation. The digital support enables self-service printing, scanning and photocopying. Other support services are binding and laminating. Though printing, scanning, and photocopying are user-self services, support is provided whenever needed.

The use of ultra-modern digital tools in accessing information resources is complemented by digital support services by information professionals who are digital experts. Digital support services enable users to taste the best experiences in accessing academic libraries' modern digital information content (Baba & Ocloo, 2026; Oseghale, 2023).

Methodology

This exploratory study used analysis of user statistics and brief interviews with students to assess the use of academic electronic information resources. The research used the constructivist paradigm with a qualitative investigation approach and interview survey based on the study variables. Convenience sampling of the nonprobability sampling techniques was used to select the interview participants. The research used a descriptive design to analyse the collected user statistics and interview data. The data was discussed based on the results of the statistics of use of the library systems and resources, and the responses deduced from the interviews, and these were supported by relevant literature on similar findings.

Target Population and Sample

Table 1 shows Ashesi University Warren Library students' user population which is the focus of the research. The total population of students is 1408. However, the library's seating capacity is 150.

Table 1
Student Population

Class/Year Group	Population/Class Size	Percentage
Class of 2024 (C2024) – Seniors	289	20.52
Class of 2025 (C2025) – Juniors	312	22.16
Class of 2026 (C2026) – Sophomore	336	23.86
Class of 2027 (C2027) – Freshman	397	28.20
Postgraduate Mechatronics 2024 (PG)	23	1.63
Postgraduate Mechatronics 2025 (PG)	26	1.85
Postgraduate Mechatronics 2026 (PG)	25	1.78
Total Student Population of the 2023/2024 academic year	1408	100

Sample and Procedures

The convenience sampling procedure of the non-probability sampling technique was used to recruit six participants for the study. The study focused on students who responded to the request to participate through an email sent to the listserv of student groups.

The participants are students who are the main target for the library's academic electronic information resources subscription and support services. Emails were sent to the participants for their consent to participate in the study. The research information sheet was attached to the email to inform participants about the research. Upon endorsing and submitting their consent, they were sent the survey instrument. The interview date and time were then arranged. The interviews were scheduled based on a day and time convenient for each participant.

The Study Participants

The study participants' information comprises the programs, class, and their major courses. There were 3 undergraduate and 3 postgraduate students. The undergraduate class shows 2 senior C2024, and 1 freshman C2027, while the postgraduate class shows 3 Mechatronics2024. There were no participants from the junior C2025, the sophomore C2026, Mechatronics2025 and Mechatronics2026 because they did not respond to the request to participate in the survey. The course majors show 1 Business Administration, 1 Computer Science, 1 Engineering and 3 Mechatronics. There were no participants from the Management Information Systems program. A total of six students consented and participated in the study. The research was to interview 15% of the library's seating capacity of 150(10 students). However, the study is qualitative and exploratory and does not require sample calculation. Table 2 shows the study participants who were interviewed.

Table 2
The study Participants

Program	No.	Class Standing	No.	Course Major	No.
Undergraduate	3	C2024 - senior	2	Business Administration	1
				Computer Science	1
		C2027 - freshman	1	Engineering	1
Postgraduate	3	Mech2024	3	Mechatronics	3
Total	6	Total	6	Total	6

Source: Data from the field, 2024.

Instrument

A semi-structured interview script was used to collect data from the participants who consented to participate in the research. The semi-structured interview script solicited information on participants' class standing, e.g., class of 2026, program/major, awareness and use of the library resources and systems, reasons for non-use, suggestions for the awareness- creation strategies and experiences of use. Variables such as library systems, platforms, academic information resources were explained to the participants. There were 15 questions

in all, excluding the participant's biodata (class standing and program/major). The interview took 10 to 15 minutes of each participant's time based on the length of the responses from the participants. Statistical data of the library OPAC (monthly statistics of use) within three months (January to March 2024) was extracted. Questions for the interview schedule are shown in Table 3.

Table 3

Interview script

The student classes/year group and programs

1. The student classes informed use of resources.
2. The student programs informed the type of resources they use.

Awareness of the academic electronic resources

1. Which of the library systems are you aware of, and are they available for students to find the academic information they need?
2. How did you know about the above library systems and academic electronic resources?
3. Which of the list of library resources are you aware of?
4. How did you know about the resource(s)?
5. Which other resources do you need most but are unaware the library can assist?

Use of the academic electronic resources

1. Do you use the library academic electronic resources to search for information for your academic program?
2. What would be your reason if you do not use the library resources to find information for your academic program?
3. Which of resources do you use most?
4. Why do you mostly use the resource(s) you mentioned?
5. Why do you not use resources you did not mention?

Experience of use of the academic electronic resources

1. What were your experiences if you used the library resources?

Satisfaction with the use of the academic electronic resources

1. Were you satisfied with the resources you have used?

Suggestions for effective awareness creation strategies

1. What would be effective ways for the library to inform students about resources?
2. What ways are presently used which, in your view, are ineffective?
3. What would you suggest the library should do for students to know about the systems and resources available in their comfort zone?

Source: Table drawn by the researcher

Data Collection Procedures

The participants were informed of the research, and the researcher and participants endorsed the consent forms. Later, the researcher arranged convenient dates and time for the interview with the participants. The six students were interviewed individually in an enclosed office in the library. The interviews were recorded, and the data was transcribed for analysis. Three months of statistics of OPAC use were collated and included in the data analysed.

Ethical Factors and Considerations

Ethics is vital in any human subject research, and it is significant to seek the Institutional Review Board's approval to conduct this research that involves Ashesi University students. Participation in this research was voluntary. It posed no risk to any information the participants provided. Anonymity and confidentiality were assured. Participants were informed of the purpose of the research and its benefits. Ethical values of privacy, anonymity, voluntary participation, fairness, integrity, absence of inducement, accuracy and nonjudgment of the findings were explained with the endorsement of the participants' consent.

Data Analysis

The interview data was recorded and transcribed. The descriptive method (frequencies and percentages) of data analysis was used to describe the variables of the data analysed. The interview data was interpreted based on the participants' responses. Interpretations of variables mentioned were presented in a word cloud to show the number of responses to each variable. Responses to the interview questions were not generalised to the entire university population, but subject to the participants' and opinions on awareness, use, and experiences of using the academic information resources. Statistical results of the three-month usage of the library OPAC and E-library were presented and analysed first. This was followed by the interview results. The findings were presented and supported with similar findings on awareness, use and experiences of use of academic electronic information resources.

Statistical Result of the OPAC Use

Table 4

Three- Month Statistics of the Library OPAC Use (All user categories)

<i>Period</i>	<i>No of Visits</i>	<i>Percentage</i>
January 1 – January 28	1465 Visits	43.34
January 29 - February 25	1033 Visits	30.55
March 4 – March 31	883 Visits	26.11
Total Visits	3381 Visits	100
January 1 to March 31, 2024		

All User Statistics of the Online Public Access Catalogue (January 1 to March 31, 2024).

Table 4 shows statistical results of the OPAC use. The OPAC sends automated user statistics weekly to the library email address registered on the Koha. The weekly statistics were consolidated into monthly user statistics of the OPAC use. The statistics were extracted to validate the interview findings on the library OPAC use. Three months of user statistics were gathered from January 1 to March 31, 2024. The percentages of the raw figures for the three months total usage were calculated with the total statistics of 3381 representing 100%.

The results showed that there were 1465 (43.34%) visits to the OPAC from January 1 to 28; 1033(30.55%) visits from January 29 to February 25, and 883(26.11%) visits from March 4 to March 31; making a total of 3381(100%) searches in the OPAC within the three-month period. The results on user statistics show the highest search in the OPAC was 1465(43.34) and it was from January 1 to 28. That was the period when the freshman C2027, new Faculty and staff attended library orientation. Login credentials were created for the new groups. Therefore, the highest usage statistics within January 1 to March 31 could be attributed to the login credentials tested with the freshman C2027 and the new Faculty and staff during the library orientations for the groups.

Table 5 below shows the statistics of E-library use by the students and according to their class category. The three-month statistics of E-Library use were extracted from January 1 to March 31, 2024. The statistics were extracted to validate the interview findings on the E-library system use. The results showed a total of 437 users, 995 logins, 491 downloads, 570.96 downloaded data in megabytes, 4263.01 browsing data in megabytes, and 4837.97 total data in megabytes. The resources used and the usage by the various class categories were further described to show the number of uses of the resources, and the percentages of use by the various class categories. The results are described with a bar chart and pie charts to depict clearly the resources used, users, logins, total downloads, download data, browsing data and total data used.

Table 5

Three Months' Statistics of E-Library Use by Student Class Category

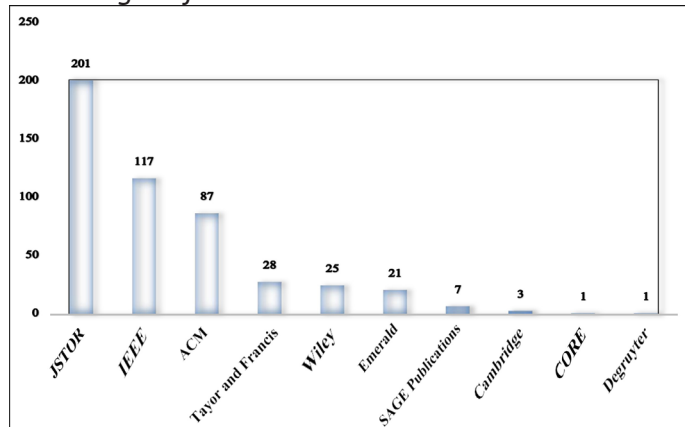
<i>Class Category</i>	<i>Users</i>	<i>Logins</i>	<i>Total Downloads</i>	<i>Download Data (M.B.s)</i>	<i>Browsing Data (M.B.s)</i>	<i>Total Data (M.B.s)</i>
Students C2024 - the seniors	207	641	362	374.23	2921.49	3299.72
Students C2025 - the junior	52	86	37	42.22	303.3	345.52
Students C2026 - the sophomore	30	51	22	76.88	208.85	285.73
Students C2027 – the freshman	130	193	70	77.63	708.62	786.25
Students PG – Mechatronics	18	24	0	0	120.75	120.75
Total Usage of E-Library by class	437	995	491	570.96	4263.01	4837.97
January 1 to March 31, 2024						

Student User Statistics of the E-Library (January 1 to March 31, 2024).

Usage of Academic Information Resources

Figures 1 to 7 are findings of academic information resources used, users, logins, total downloads, download data, browsing data and total data used from the E-library system.

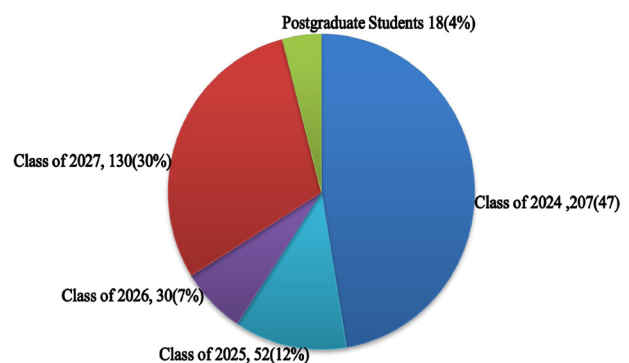
Figure 1

Percentages of Resources Used

Source: Extracted from the E-Library System, 2024.

Figure 1 shows the resources used and the number of times over the period of January 1 to March 31. Out of the available 30 academic electronic information resources hosted on the E-Library system, 10 were used. The result shows the number of times the resources were used in the highest-ranking order: 201 jstor.org, 117 iee.org, 87 acm.org, 28 tandfonline.com, 25 wiley.com, 21 emerald.com, 7 sagepub.com, 3 cambridge.org, 1 core.ac.uk, and 1 degruyter.com.

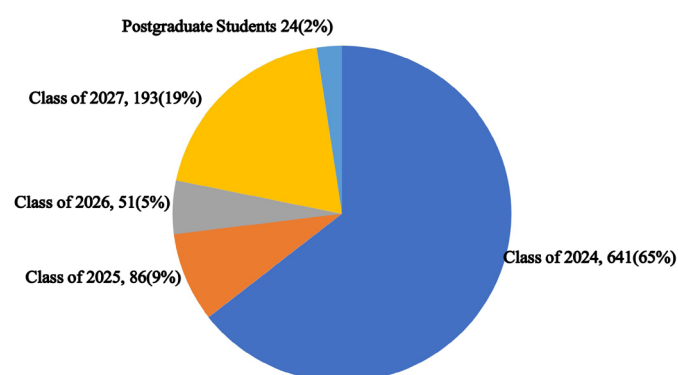
Figure 2

Percentage of Users of E-Library System by Class

Source: Extracted from the E-Library System.

Figure 2 shows the number of users in the various class categories and their use of the resources over the period of three months. The results are: 207(47%) users of the senior C2024, 52(12%) users of the junior C2025, 30(7%) users of the sophomore C2026, 130(30%) users of the freshman C2027, and 18(4%) users of the PG students. The findings show that the class of 2024 used the resources most, 207(47%), while the PG students used the resources least, 18(4%). The senior class/final year students are the class of 2024 who are almost half of the total users in the system even though they represent only 20.52% of the total students at Ashesi University. It is questionable why the freshman class of 2027, who form the largest population of 397(28.20) had user statistics of 130(30%) less than the senior class or final year of the senior C2024. Postgraduate students account for the least percentage of users 18(4%) which might be anticipated as they represent only 74(5.26%) of the student population.

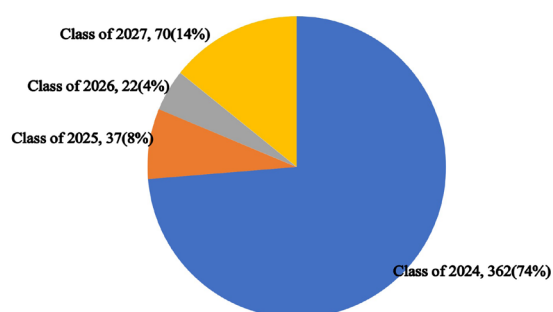
Figure 3
Percentage of Unique Sessions of the System and Resources by Class



Source: Extracted from the E-Library System, 2024.

Figure 3 shows the unique sessions of the system and resources accessed by the various classes over the three-month period. The result shows 641(65%) unique sessions by the senior C2024, 86(9%) unique sessions by the junior C2025, 51(5%) unique sessions by the sophomore C2026, 193(19%) unique sessions by the freshman C2027, and 24(2%) unique sessions by the PG students. The findings are that the senior C2024 class accessed the most unique sessions, 641(65%), while the PG students have less unique sessions of 24. The result of the usage reflects the unique sessions based on student population. The senior year class of 2024 with highest usage of 207(47%) with a population of 20.52%, reflects the highest unique session of 641(65%), while the PG students had a usage of 18(4%) with a population of 74(5.26%), reflects the least unique session. As far as the PG students' least use of the resources is concerned, it could be ascertained that they are using the resources at a rate proportional to their population.

Figure 4
Percentage of Downloads by Class

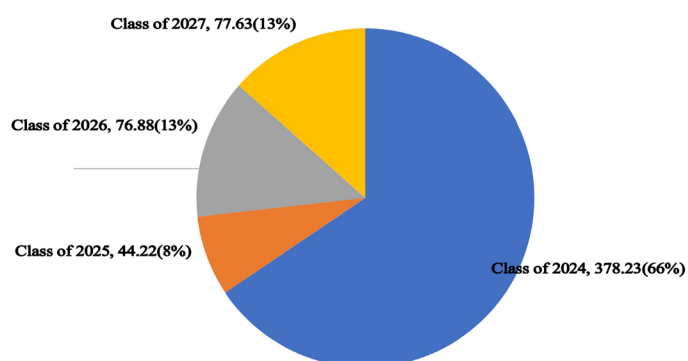


Source: Extracted from the E-Library System, 2024.

Figure 4 shows the total downloads of the

academic information resources over the period of three months. The result shows 362(74%) downloads by the senior C2024, 37(8%) downloads by the junior C2025, 22(4%) downloads by the sophomore C2026, 70(14%) downloads by the freshman C2027, and no (0) downloads by the PG students. The result shows that though the other classes had some downloads, the senior C2024 had downloaded the most with 362(74%), while there was no download by the PG students. Though some of the PG students had some sessions, nothing was downloaded by the group. While the PG students' zero downloads could be attributed to their low population, the freshman class of 2027 with the highest population (397) had 70(14%) downloads as compared to the senior class of 2024 (289) with 363(74%) downloads. This is a concern which must be addressed to improve future usage statistics of the class of 2027.

Figure 5
Percentage of Data Downloads (M.B.s) by Class

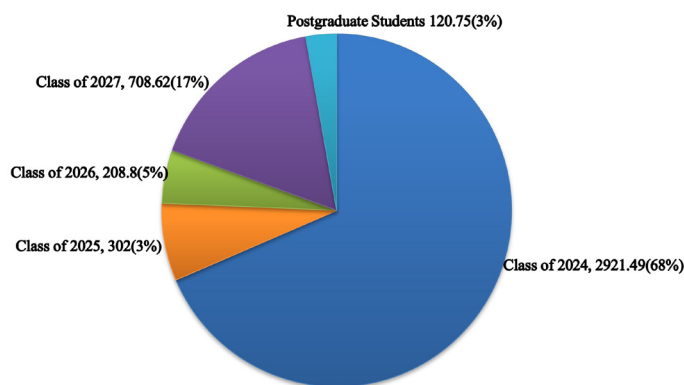


Source: Extracted from the E-Library System, 2024.

Figure 5 shows downloads of data in megabytes from January 1 to March 31. The result shows downloads of data as follows: 378.23(66%) by the senior C2024; 44.22(8%) by the junior C2025, 76.88(13%) by the sophomore C2026, 77.63(13%) by the freshman C2027 and zero (0) by the PG students. The results show that senior C2024 had the highest downloads of data of 378.23(66%) megabytes, while the PG students did not download any data within that period. This reflects the findings on the number of users, unique sessions and total downloads. The figures show that the PG students used the e-library system as indicated in the users' results, but they did not download any informational material (articles or ebooks). It is worth noting the population of the three other classes in highest percentage order; the freshman C2027 were 397(28.20%), the sophomore C2026 were 336(23.16%) and the junior C2025 were

312(22.16%). The freshman, sophomore, and junior classes population are above 20%. While the senior class C2024 population 289(20.52%) is a little above 20%. However, the percentage of downloads of the three other classes (freshman, sophomore, and juniors) altogether are far below 66% of the senior C2024 downloads. The differences are 58% between the seniors and juniors, 53% between the seniors and sophomores, and 53% between the seniors and the freshman class. The result cannot be attributed to the population. Again, the result cannot be attributed to the seniority of the classes because the percentage of the download of the sophomore C2026 is 76.88(13%) and that of the freshman C2027, 77.63(13%) is 5% more than the percentage of download of the junior C2025, 44.22(8%). The results could be because the senior C2024 are better aware of the academic information resources and are using them most of the time. Also, the awareness and use of the academic information resources by the senior C2024 could be that they have had several class sessions with the library over the three academic years of learning and research before their final fourth year.

Figure 6
Percentage of Browsing Data (M.B.s) by Class

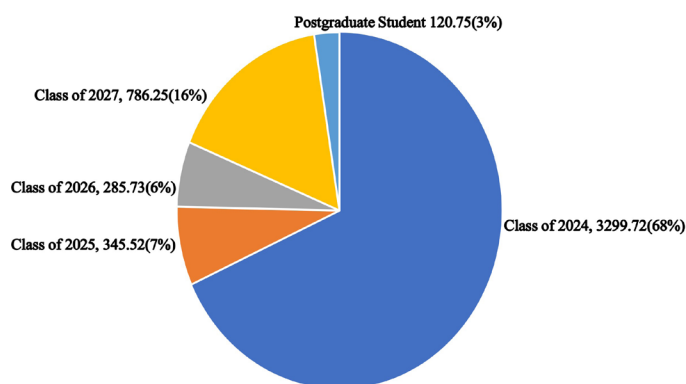


Source: Extracted from the E-Library System, 2024.

Figure 6 shows browsing data in megabytes over the period. The browsing data results by the various classes show 2921.49(68%) by the senior C2024, 302.3(7%) by the junior C2025, 208.85(5%) by the sophomore C2026, 708.62(17%) by the freshman C2027 and 120.75(3%) by the PG students. The results of the browsing data show that the senior C2024 had the highest browsing data of 2921.49(68%) megabytes followed by the freshman C2027, 708.62(17%), the juniors C2025, 302.3(7%), and the sophomore C2026, 208.85(5%), while the PG students had the lowest browsing data of 120.75(3%) megabytes. The

findings indicate that though the PG students had no downloads, they visited the E-Library system to browse through the academic resources.

Figure 7
Percentage of Total Data (M.B.s) Used by Class



Source: Extracted from the E-Library System, 2024

Figure 7 shows the over the period of January 1 to March 31, 2024. The results of the total data in megabytes used by the classes are: 3299.72(68%) by the senior C2024, 345.52(7%) by the junior C2025, 285.73(6%) by the sophomore C2026, 786.25(16%) by the freshman C2027, and 120.75(3%) by the PG students. The results of the highest total data usage of 3299.72(68%) megabytes is by the senior C2024, while the lowest usage of 120.75(3%) megabytes is by the PG students. These indicate that the PG students had used some data in browsing, though they had not downloaded, nor have they conducted any unique sessions.

Overview

Since the senior C2024 have used the resources most, they have had the highest logins, total downloads, and browsing data, showing a ripple effect on the total data used by the same class. The freshman C2027 had the higher 786.25(16%) total data, followed by the junior C2025 with 345.52(7%) total data, the sophomore C2026 with 285.73(6%) total data and the PG students with 120.75(3%). The differences in total data usage between the senior C2024 and the other four classes and the PG students is huge as compared to the differences of total data among the freshman C2027, sophomore C2026, juniors C2025 and the PG students. This shows that awareness of academic information resources and usage are negligible.

Results of Interviews

Result of the interview supported the statistics of

use of the library OPAC and E-library systems which host the subscribed academic electronic information resources.

Awareness of the Library Systems

The students interviewed were asked to select from a list of the library systems they know. All the students interviewed mentioned the library OPAC, the E-Library and the webpage. This shows their awareness of the library systems. Two students among those interviewed were aware of the Library Guides (Libguides), which the library has newly subscribed to and is being designed. One student used the web print and seminar room booking platform through the library OPAC.

Awareness of the Academic Electronic Information Resources

The library subscribes to 30 academic electronic information resources. Students interviewed were handed a list of the resources to select the ones they are aware of. The results in general showed that the students interviewed are aware of 11 of the resources which are ACM Digital Library,

Boabab ebooks, Buku, IEEE, Ebscohost, ElgarOnline, JSTOR, New York Times, Sage, Research4Life and Taylor & Francis. However, the usage statistics of the resources were low. This finding is supported by the findings of Adeniran (2013) that students were aware of electronic resources, but usage results were low.

Awareness of Academic Electronic Information Resources

The students interviewed mentioned that they became aware of the resources through first-year library orientation and library staff invitations to class tutorials on literature search. One student specifically remembered; "In 2020, there was an orientation when the library staff introduced us to the electronic resources." Also, "the library staff had been in the statistics class to introduce us to information searching skills." Two other students mentioned the "library page" or systems as means of awareness of the resources. One student mentioned, "posters and fliers" in the library.

Use of Academic Information Resources

The students interviewed mentioned that they use the academic electronic information resources that mostly provide information on their academic

programs of study. Also, a student mentioned that he uses Google Scholar to search first to find the information and used the directions to the resources to search. 'Sometimes, I do not get the full text from Google Scholar when I search, so I go to the resources that direct me to get the full text.'

Why Some Academic Information Resources Were Not Used

The students interviewed mentioned that they do not use all the resources because some do not apply to their fields of study. For example, the engineering and computer science students mentioned using only IEEE and ACM. 'Sometimes, it is difficult to find the information I need.' 'They don't have the information I usually look for.'

Experience of Using the Academic Electronic Information Resources

The students were asked to talk about their experience in using academic electronic information resources. The students interviewed mentioned that their experience in using the resources has been good so far. Some of the responses on their experiences are underlisted. The explanation was that specific resources are not available in full text and advised on some essential resources that should be subscribed to for the program of study, e.g., Springer Resources. 'Many times, I have found an article that is good for me to use, but I could not get full access because the articles are in Springer. Some time ago, we got access, but now there is no access.' 'When the information you are searching for is unavailable, it is easy to use Google Scholar to search for it.' 'It is easy to navigate through the resources.' 'It is convenient and easy to navigate.' 'It is convenient and always has the information I need.' 'Easy to use and direct, easy to get to resources I need.' 'Without the help of a library staff, it is always difficult for me to find the book I need.' 'Booking the conference room is easy and printing sometimes.' 'The library staff is accommodating.' A student uses academic information resources to get what is needed.

Figure 8

A Word Cloud on Awareness, Use and Experience



Source: Researcher generated word cloud, 2024

Figure 8 shows a word cloud on the research variables, i.e., aware, unaware, use, unuse, satisfactory experience, and unsatisfactory experience. The variables show a greater number being 'aware' than the word 'unaware', with some 'use' and a few 'unuse', some 'satisfactory experiences', and a few 'unsatisfactory experiences'. The word cloud was generated by the researcher based on the responses to the research variables.

Most Needed Resources that Students Were Unaware of

The researcher asked the respondents to mention resources they need but are unaware if the library subscribes to. The responses include 'My course requires some resources in Springer, but I could not find them.' A student is okay with the resources they have access to, 'At the moment, I am not in need of any resource which I have not got.' Effective Ways of Creating Awareness of Academic

Electronic Information Resources

The students interviewed were asked to select from a list of awareness-creation strategies that might be effective for the library to use to create awareness of the availability of the academic electronic information resources. The following were their choices.

- YouTube videos
- TikTok videos
- Email Message
- Library webpage
- Library guides (LibGuides)
- WhatsApp Message
- QR codes are posted on the library shelves.
- First-year Orientation
- Ask a Librarian (Word of mouth)
- Library Week
- Library outreach
- Information on the library OPAC
- Invitation to class presentation

Ineffective Ways Being Used Presently to Create Awareness

Also, the students interviewed were asked to select from a list of awareness-creation strategies that the library uses presently but they feel are ineffective. The following were mentioned as ineffective awareness creation strategies presently being practised by the library. TikTok videos

- Email Message
- Facebook posts

- Twitter, which is renamed X posts
- Library webpage

Besides, the students interviewed suggested some strategies that might be effective in creating awareness of the Library Systems and Resources as outlined below.

- 'A sound system should be acquired and used at a time within the week to announce information about the library.
- 'Send weekly library announcements to students via easily accessible and effective platforms of communication.' For example, TikTok and YouTube videos.
- Using an example from the banks and industrial sector, a student wanted a flat screen television to be positioned in the library to showcase the systems, resources and services, and how students should use them.
- 'Organise community broadcast about the available electronic resources or involve in community talk shows to give information about the library's resources.
- Collaborate with the Student Council and Public Relations to use their Snapchat to disseminate the library souvenirs and to communicate to students about the resources and benefits of using them.

Discussion

Discussion of the results and findings was based on awareness, use, experiences and suggestions for the best awareness-creation strategies. Other findings on the use of electronic resources, technology systems, awareness creation strategies, and user experiences were referred to support some of the findings of this study.

Awareness

The students interviewed claimed awareness of the library systems and academic resources. However, findings show the systems and resources were mostly used by the senior C2024 working on the Theses and applied projects, and a few freshman C2027 who accessed the systems and resources during library orientation. It was ascertained that the resources are mostly used during the writing of theses and applied projects, and library orientations by the classes involved. This means that despite the general belief among librarians that single library sessions/orientations are not effective, students in this study learned about the library's systems and resources and

recollected some academic electronic information resources from first year orientation sessions, and library staff visits to their classes.

Use of Resources

There is a higher percentage of the library systems use by the undergraduate students than the postgraduate students. The population of the undergraduate classes is higher than the postgraduate classes, which showed that at least a few users of the resources are postgraduate students. The usage statistics of the academic electronic information resources on the E-Library system show that students use specific resources of which they are aware. These resources pertain to their academic programs, and they were directed to use them to complete specific class assignments, theses and projects. During the extraction of the user statistics, the senior C2024 were in the final year and at their peak season of working on these and applied projects. Besides, the findings show that the PG students visited the e-library system, browsed, used some amount of data as indicated in the users' statistics, but they did not download any informational material such as articles or ebooks. This could be attributed to the fact that the PG students have access to an external resource through the Eidgenössische Technische Hochschule (ETH) Zürich affiliate for the PG Mechatronic program. A postgraduate student interviewed mentioned that she only uses the library seminar room for quiet study, uses the printers and therefore goes to the library with her reading resources.

How Students became Aware of the Resources

Students became aware of the availability of the academic electronic resources through orientations, class presentations, doing work-study in the library, asking library staff, Faculty recommendations, databases needed to use for assignments, and use of course related resources, for example, EBSCOhost and JSTOR. This discussion is akin to the findings of Frempong-Kore & Samuel, (2024) who stated that students mostly use electronic resources, such as JSTOR, Emerald, EBSCOhost and Science Direct. In this study, JSTOR, IEEE and ACM were the most used resources.

Why Students did not Use Certain Resources

Some students did not use certain resources for lack of awareness, and searching for skills in navigating through the resources to find what they want. Also,

the students focus on resources they need for their academic programs.

Students Experiences of the Resources Used

The students interviewed had satisfactory experiences of the resources they have used, together with using the library OPAC and E-Library systems. The students have had good experiences in using the academic electronic information resources. However, some resources they need are either not subscribed to or not available in full text. Therefore, there is the need to ascertain and subscribe to essential resources to enable students to find such articles in full text, for example, Springer and Elsevier. There were some best search experiences of easily and conveniently navigating through the resources beginning a search with Google Scholar. Some searches had been easy and directed to the information needed. However, some students find it difficult to get the information they need and want the help of the library staff. Using the seminar room booking system has been easy for the students. The library staff were commended as being welcoming and accommodating.

Suggestions for Best Awareness Creation Strategies

The students interviewed prefer effective awareness creation, such as library outreach, library week celebration, TikTok and YouTube videos to promote the resources in addition to class presentations and orientations. Emails, Facebook and X social media platforms are presently used by the library but are not the students' preference. The students' preferred effective awareness creation strategies as recorded earlier are YouTube videos, TikTok videos, Email Message, Library webpage, Library guides (LibGuides), WhatsApp Message, QR codes posted on the library shelves, First-year Orientation, ask a Librarian (Word of mouth), Library Week, Library outreach, Information on the library OPAC and Invitation to class presentations. In general, the findings offer a wake-up call to the best awareness creation strategies to improve academic electronic information resources use, for the best user experiences and value for money.

Recommendations

The study recommends the following to librarians, library staff, and consortia members.

- Awareness campaigns of the academic electronic resources must include a mention of the purposes and benefits of the resources subscription.
- The library orientation and awareness creation

must be continuous processes targeted at the freshman, sophomore, junior classes and the postgraduate students because they are not using the resources as expected.

- Effective awareness creation strategies, such as library outreach, library week celebration and social media tools, such as TikTok and YouTube videos in addition to class presentation and orientation should be used.

- The library must provide continuous information literacy and potential searching skills sessions with continuing students for the best usage and experience.

- There must be continuous extraction of usage statistics of the library systems and the subscribed to academic electronic resources upon which decisions of change in awareness creation can be made.

- Continuously seek students' opinion on the effectiveness of present awareness creation strategies through a suggestion box.

- There is the need to subscribe to some essential academic electronic and full text resources.

Conclusion

This exploratory study was conducted at one university, and it provides some insights into the awareness of academic electronic information resources regarding usage. More research is needed to determine the relationship between variables like awareness, use, experience, information literacy instruction, and specific awareness creation strategies on usage of academic information resources in the students' comfort zone. Comparing results of similar studies among a few CARLIGH university libraries might provide useful consortium-wide guidance for libraries eager to get good value for the funds used to subscribe to the resources. Most of the findings, ideas, and knowledge generated through this study are different as compared to three other similar studies on awareness creation of electronic resources in Ghanaian academic libraries. Also, this study included user experience, and satisfaction of using the resources. Therefore, the study has generated new knowledge which adds to the existing knowledge on awareness creation and electronic resources' use in academic libraries in Ghana.

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