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Academic Library service model for e-learning environment: a case study

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Abstract

During the crisis time, teaching and learning activities were carried out remotely using digital teaching and learning apps/devices. In online learning, it is essential to identify the need to respond on time. Libraries are the primary provider of information resources/services to the academic community. In Sri Lankan academia, the time to adopt technologies has become mandatory due to safety concerns and the COVID-19 situation. In this research, one state university was chosen as a case study, and academic staff, students, and library staff were considered as the population. A stratified random sampling method was used to conduct the study. The data collection is done through the questionnaire. The primary framework was modified based on suggestions identified through data analysis. This study aimed to seek the current situation of the e-learning support of the University libraries and to identify other service opportunities in an e-learning environment. Research gaps and factors were identified because of the review process and findings. The findings were identified through major areas, such as e-learning, resources, learning services, ICT infrastructure facilities, Information professionals' roles, and skills and management policies. Library services can proactively organize according to user requirements. For this, library pre-planning is greatly important. The conceptual model presented in this paper was developed based on gaps identified through reviewing existing literature, research results, and user suggestions. Libraries that are conducting user surveys could consider the factors presented in this model.

Keywords: Academic libraries, Online learning, Conceptual model, E-services, E-resources, ICT infrastructure

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Introduction

State universities and other higher educational institutes and college libraries are considered academic libraries and world university education is focused on teaching, self-learning, and research (Sagitova, 2014). Through the self-learning process, individuals will be able to gather knowledge. This will fulfill their information requirements. Currently, self-learning needs technology. Technology has grown greatly in recent times around the world. According to Kanaganayagam (2013), the local universities primarily use traditional classroom-based teaching for the delivery of course content. E-learning platforms are easily accessible to users by connecting through many devices like desktop computers, laptops, tablet PCs, and smartphones. The development of ICT has brought a remarkable change to the traditional education process with the massive use of multimedia technology and the Internet. (Prasad, et al, 2017). Institutions have identified the value of e-learning in transforming people, performance, and knowledge. (Prasad, et al, 2017).

E-learning has made a rapid change in the higher education sector with active student participation. It has created an interactive learning process (Kanaganayagam and Fernando, 2013). The study done by Mathara Arachchi et al. (2010) identified the point of the learner style and the course materials. It has been mentioned, the creation of E-learning content and material has to match the learner's learning styles.

According to Ghavifekr, S. & Rosdy, W.A.W. (2015), integrated e-learning provides libraries with an effective means of reaching faculty and students directly, when they engage in teaching, learning, research, and outreach. In turn, this integration provides enhanced services to an academic community that has used traditional library services. This made it possible to reach users who started to ignore the library, and go directly to the Web for their information needs. The addition of an enhancement to traditional classroom activities with electronic elements epitomized by the rise of the course management system is changing the way of accessing, creating, and using information. It has provided libraries with new opportunities to develop and share new services. As libraries create these new services, they should

showcase their irreplaceable expertise skills and resources. (Ghavifekr, S. & Rosdy, W.A.W. , 2015).

Problem statement

The university education is converting into a learner-centered teaching method. In the traditional process was teacher-centered education and the gradual conversion to student-centered learning started. The universities have identified Learning Management Systems for content sharing, and it is a fundamental element in the online learning process. E-learning is a more advanced, and attractive process of teaching and learning. The library must play a key role in supporting the work of teachers, and reaching students. The staff needs to engage in teaching, learning, and research. In Sri Lanka, university library involvement in learning activities was not at a considerable level. The library needs to understand the situation and needs to increase involvement in academic work. The library needs to work with relevant faculty authorities to fulfill student and staff information needs. Then the library can identify the way they have to improve the services and access resources. If the academic library does not have proper discussion and coordination with learners and academic departments, they cannot provide proper services to their clientele. In the Sri Lankan university education sector, libraries are handling individual processes, though it is vital for them to understand the value of coordinated services. For the improvement of the services, the libraries need to understand the current process and build up user-oriented services. Otherwise, the library cannot make significant involvement in the university education process.

Research objectives

In this study, a few objectives are considered. They are,

- To seek the current situation of the e-learning support of the University Libraries
- To identify other service opportunities in an e-learning environment

Literature Review

The mission statement of the Ministry of Education of Sri Lanka (2013), the main target is to build up a skillful nation with a better advantage of modern technology and knowledge. It has mentioned, "To develop an excellent education system which enables students to acquire knowledge, skills, attitudes, and values to be future citizens who will perform their roles efficiently and effectively in a modern, globalized, knowledge-driven economy."

In tradition, teacher-centered education is the norm, and it has focused on student-centered learning. The development of the teacher's ICT skills is also the biggest requirement to implement student-centered education (Eklund et al. 2003).

Abeyrathne & Ekanayake (2019) conducted a study on "The role of academic libraries for augmenting self-directed learning in higher education". Self-learning is an important concept in the process of higher education and university libraries are an essential component of the creation of a learning environment. This provided students with insight into the use of library resources for their learning approach and the satisfaction of undergraduates with library resources and services, as well as their competence in information literacy and how academic libraries could support SDL in higher education.
In addition to that, learning techniques are more useful for any learning process. It is helpful to build effective courses. Learning instructional design is highly important for effective learning. In implementing effective e-learning, there are several techniques. Blended learning techniques, Collaborative learning, Micro-Learning, Video learning, and Rapid e-learning techniques are used for e-learning courses. (Epignosis,2014).

Many people have defined e-learning in a different way. According to the study, "e-learning is defined as ICT in support of face-to-face teaching and

learning that also involves the form of interaction and collaboration" (The researcher, 2019). That is shown in figure 1 below.

Figure 1. E-learning continuum.
Source:https://blogs.ubc.ca/etec5202015/unit-1/unit-2-what-is-e-learning/

Ratnapala (2014) has conducted research under the theme of 'Adopting e-learning for university education in Sri Lanka' based on the University of Peradeniya, Sri Lanka. That has introduced e-learning for the student through the learning management system. In conclusion, the adoption of e-learning has not been successfully implemented within the university system. The researcher pointed out that successful implementation of e-learning in higher education should include a curriculum with in-depth training for both parties in the university learning process.

Prakash (2017) has identified that academic libraries serve primarily to provide teaching, learning, and knowledge sharing in the information age. Most of the academic libraries are well equipped with modern technology facilities and human resources.

The theme of e-learning and e-library services at the University of Ghana: Prospects and challenges were explored using an e-learning platform and a knowledge environment for Web-based learning. It has mentioned the need for e-library services, and has given important suggestions for the implementation and development of e-learning and e-library services for African countries, and how e-library services and e-learning are important for developing countries (Dadzie, 2009).

The libraries have changed their ways to support the e-learning process. Manchester University has figured out the learning support structure as mentioned below. It has noted how they conduct support services in the past and present. All those things have changed according to the university strategies and values of all the faculties (Cheung, 2014).

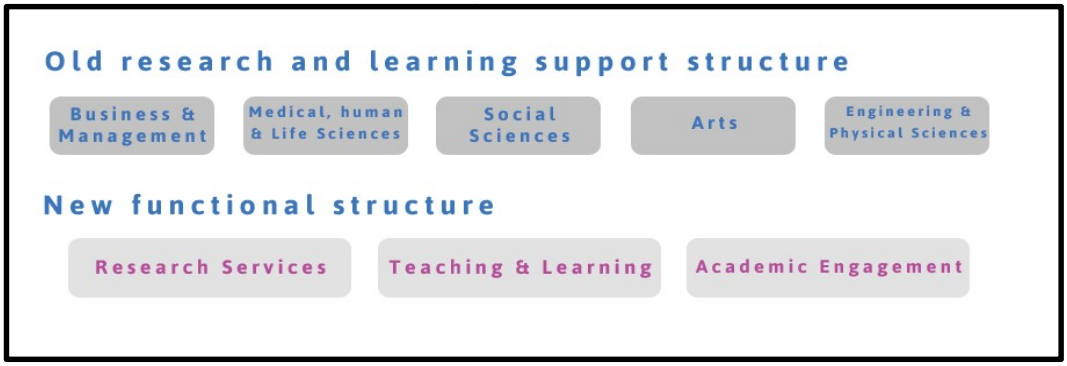


Figure 2. Learning support structure.

In 2007, the University of Botswana (UB) introduced a concept for e-learning as a Digital Scholarship Task Group. It has given guidance for e-learning, library services, and e-research in the digital working environment. It has mentioned the role of academic libraries. They are supporting UB's research, teaching, and learning policy. UB library provides its service to all the academic and learning community. They have mentioned how to link the digital library and the e-learning process. UB has started to support distance learners with the coordination of e-resources, e-book services-reserves, institutional repository services, e-referencing services, and learning commons (Nfila, R. B.,2015).

Theoretical Framework

Libraries must accept the information landscape and organize to facilitate effective library services through a shared view. Institutional repositories, Metasearch, e-learning, and course management, exposing library collections to search engines are the areas considered in the modern library view (A service framework for libraries, 2006). A framework helps to reshape library user expectations, and identify critical points in user services and other

administrative processes. The investigated research issues were identified through the process of literature review and categorized as E-resources, E-services, ICT infrastructure facilities, Roles and skills of information professionals, Management Policies, and General opinion of e-learning. It makes proper understanding to reshape the model for this research.

Libraries are facilitating beyond the physical collections with the support of digital technology advancement (Proceedings of the IATUL Conferences | Purdue University, 2011). There are many frameworks aimed at e-learning processes and support. Online learning models provide invaluable frameworks for understanding the integration of technology and pedagogy that help to identify the major difference between the current and desired situation. (Engelbrecht, 2003). There are many frameworks.

Table 1. E-learning frameworks

Name of the framework	**Author(s) and year of publication**	**Focus area**
Strategic e-learning model	Meng-Jung Tsai,2009	Students as active, self-determined individuals who process information and construct knowledge (Tsai, Meng-Jung, 2009)
The demand-driven learning model	MacDonald et al, 2001	Encourage academics to take a proactive role in the development and use of technology in the teaching process (Colla J MacDonald, et.al, 2001)
Instructional design model	Conrad, 2000	This focused on e-learning processes of designing, developing and delivering curriculum material and traditional classroom learning specify some combination of planning, implementing and evaluation to organize and present curriculum content (Conrad, 2000).
The community of inquiry model	Garrison and Anderson, 2003	Gives educators an in-depth understanding of the characteristics of e-learning. This has three key elements called cognitive presence, social presence, and teaching presence (Garrison, D. R., Anderson, T., &

		Archer, W.,2000).
University library management model	Tuamsuk, Kwiecien, and Sarawanawong, J (2013	Cover physical library service areas, (Tuamsuk, Kulthida et. al, 2013).

(The researcher, 2019)

Considering several theoretical models, the researcher re-structured a model based on a university library management model for students' learning support model created by Tuamsuk, Kwiecien, and Sarawanawong, J. (2013). It was the most suitable and adjustable model for this study. But it has created a traditional learning environment. The researcher has used the identified factors that affected the academic library support process and re-arranged the model.

Academic Libraries run under the policies of the main organization. All the policies related to the library affect libraries' day-to-day functions/operations. The universities should have proper teaching and learning support policies with coordination of the library. The libraries must deliver effective information services, resources, and other facilities (Punpruk, 2004).

The model focused on the student-centered learning process with an institutional development goal. The success of the university depends on the learning achievements and research output of the university. All the administrative and management policies are worked behind. The library should give priority to users, and it should have a work process to save the users' time. In the technological era, the library needs to arrange services with proper guidelines for arranging existing resources, acquisition of new resources, digital learning media, and all the other learning support services (Tuamsuk et al, 2013).

Information professionals should have a proper understanding of the university learning process, programs offered by the university library, information management, and other administrative strategies. The library staff should have strong interpersonal relationship-building skills, learning resources, and professional experiences (Tuamsuk et al, 2013).

The university library works as a major student learning support mechanism. The course instructors can promote self-learning among the students and the library itself can develop their resources/services among users. The policy and management systems governing university libraries have more power, and vital correlates to the student-centered learning process (Punpruk, 2014). Under the administrative role, administrators are the leaders of institutional success. Participatory involvement is compulsory for informational professionals. The information professionals can incorporate all the library services/functions, and subject specialists can provide their maximum support for the success of user services (Hall, Budd., 2005).

The academic library learning environment is one of the long-standing representatives of non-classroom, informal learning spaces. (Nitecki & Simpson, 2016) It has an internal environment related to the learning facilities. In this study, the learning support services were considered and changes were made according to the technological educational environment. This model consists of six main factors: E-resources, E-services, ICT infrastructure facilities, roles and skills of Information Professionals, management policy, and general opinions, which are shown in figure 3 below.

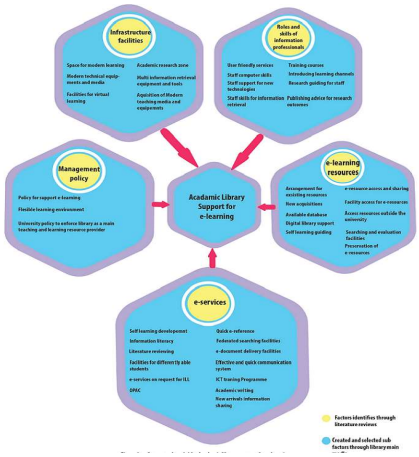


Figure 3. Academic library support for e-learning model (The researcher, 2019)

The university libraries consist of three user categories called academic staff, administrative staff and students. Libraries should provide digital collections with constantly developed context. Digital collection and digital scholarship are the main activities of the libraries, and research and teaching are the core of the libraries.

Methodology

This research used the quantitative research method to conduct a case study. A quantitative and descriptive approach was used to identify the importance. According to figure 4, the focused groups were undergraduates, academic staff, and library academic and administrative staff.

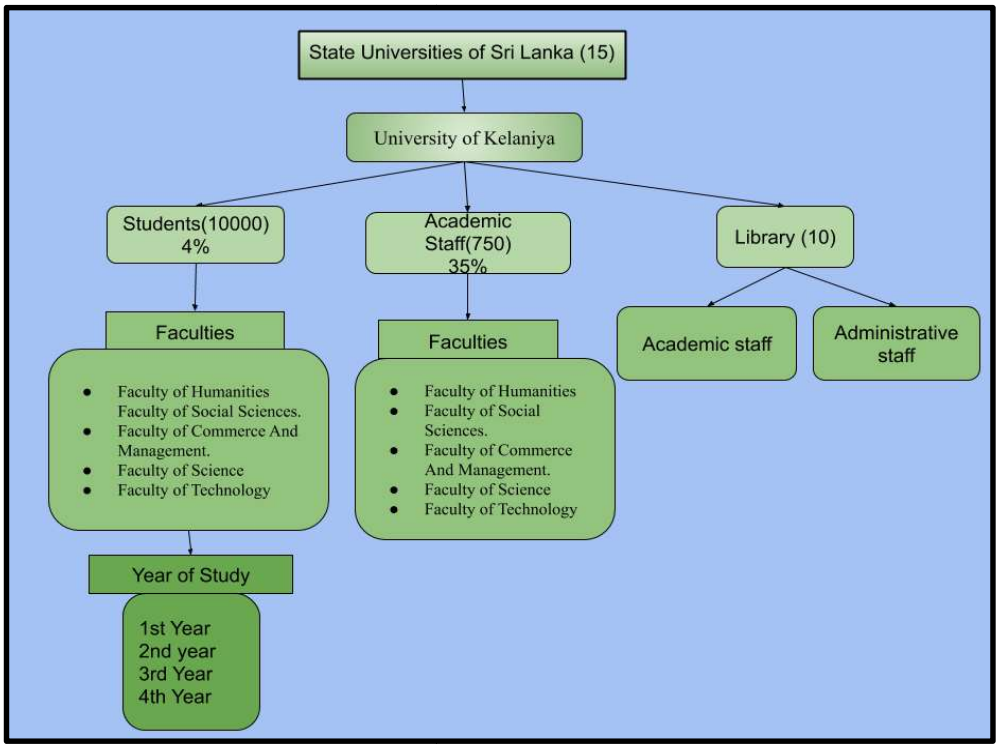


Figure 4. Case structure.

Under probability sampling, the stratified random sampling method was used for this study. In this study, the questionnaire method was used for collecting data from all three categories. Data was collected from the students using

printed questionnaires, while the data was collected from the library academic and administrative staff via online Google forms. On the other hand, academic staff members preferred both online Google forms and the printed questionnaires. Therefore, both the ways were used to collect data from the said-three categories. The general opinions were checked through the open questions. That helped to identify the respondents' views on this research because of the time limitation and crisis. There were no management-related questions in the students' questionnaire, and that were included only in the questionnaires for academic staff and library staff. The data capture and analysis process were performed using the IBM Social Sciences Statistical Software (SPSS) version 24 and the software package used for interactive statistical analysis.

Data Analysis and Findings.

Response analysis

According to the findings, altogether a total of 309 participants have responded to the survey.

Table 2. Response Analysis.

Respondent	Sample	Respondent	Response rate
Students	370	228	67.6%
Academic staff	254	51	20%
Library academic and administrative staff.	10	8	80%

It shows a higher number of female participants, with a 66% rate of responses. According to the staff responses (in both staff categories academic staff and library academic and administrative staff), male participation is at a higher level than the female.

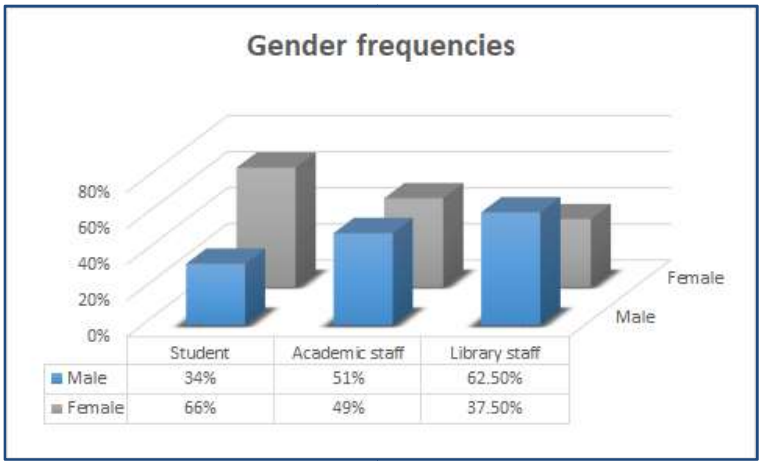


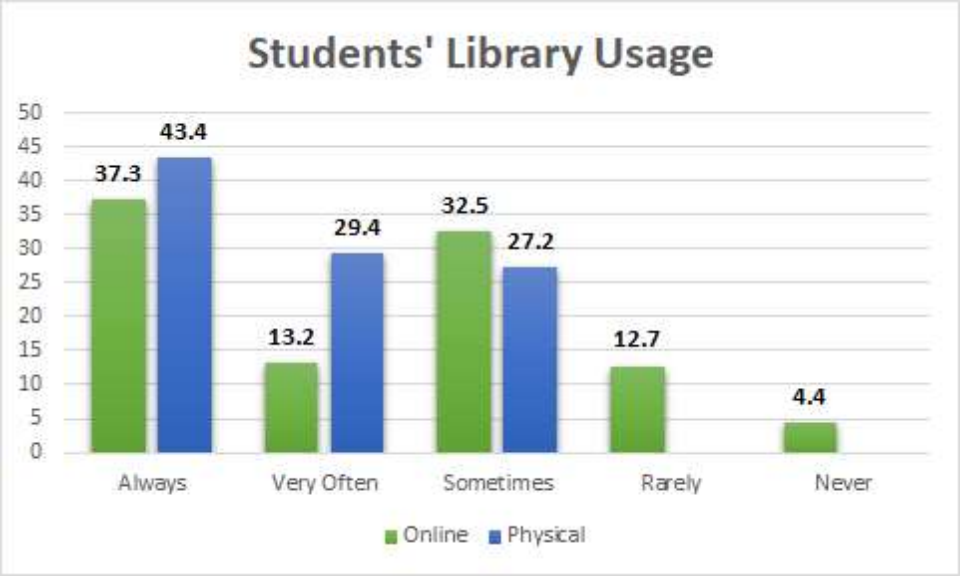
Figure 5. Students / Staff Gender frequency.

Under the age-frequency of the students' category, there were four age levels, and all the students answered this query. Most participants are in the age range between 21 and 25 years, which stands at 89.5%. The second highest age responses came from the range <=20. That means most of them are from the 1st year of all the respective faculties. In figures 3, library academic and administrative staff and academic staff age frequencies have been given together. It shows that the age range between 26-30 of the academics which stands at 50% and the 31- 35 age range of library staff which stands at 33.3% have responded in the highest levels. Other age ranges also have been represented with lower numbers of respondents.

Library usage

Students' library usage

Figure 6 depicts the level of library usage by students both physically and online, where the physical usage is higher than the online usage of some



users.

Figure 6. Students' library usage

Academic staff library usage

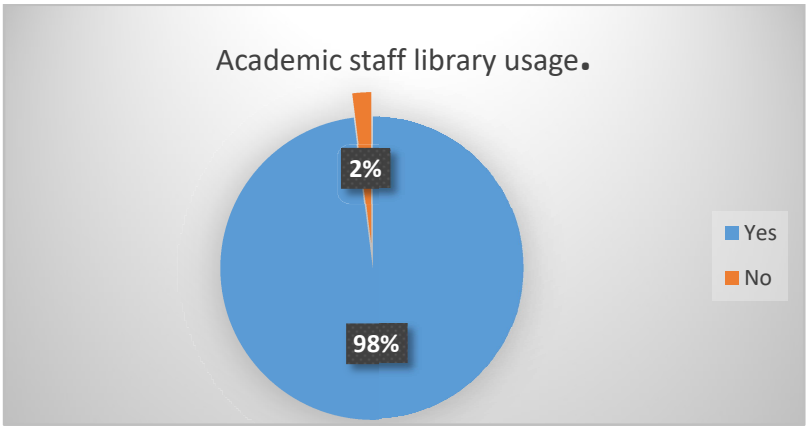


Figure 7. Academic staff library usage.

According to figure 7, most of the academic staff respondents use the library for their teaching purposes: i.e. 98% of the respondents of 51, which implies that they have positive usage of the library for the day-to-day teaching process.

According to figure 8 and 9, most of the students and academic staff members are using Moodle LMS for their academic purposes. It has a high level of usage, that is 70% of students and 67% of academic staff, respectively. On the other hand, in the student category, some of the students do not have any experience with LMSs.

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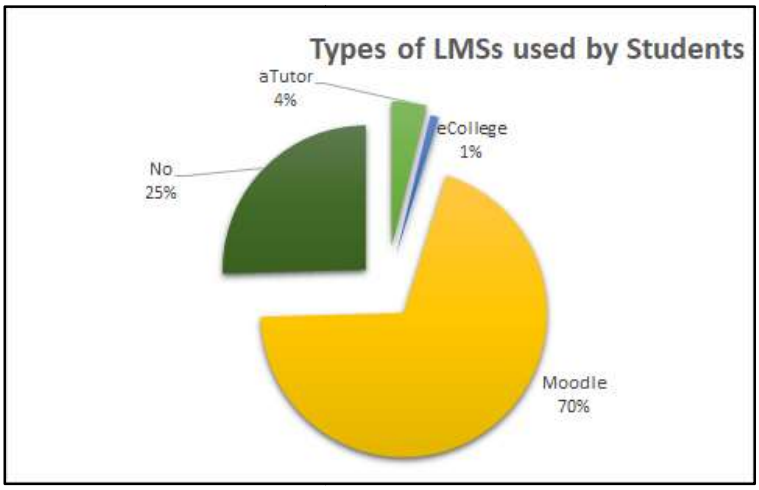

Figure 8. Types of LMSs used by Students

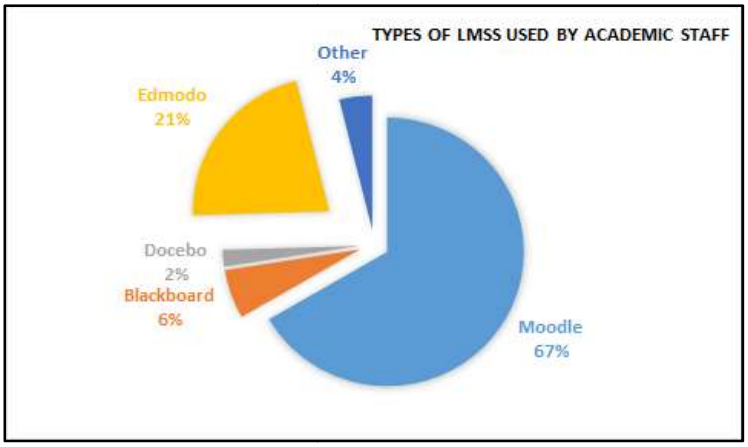

Figure 9. Types of LMSs used by academics.

Library support for E-learning

All the main sections E-Learning resources, E-Services, Information Communication Technology Infrastructure Facilities, Roles and Skills of information professionals, Management policy, and General Opinion came under the library support for e-learning in university education. The measuring of the mean and the standard deviation of the items (in the questionnaire) came under each sub-point. The respondents were asked to rate each of the items by using the 5-point Likert scale, where there are ranges from 5 (Excellent) to 1 (Poor).

In e-resources, it has considered providing library e-resources for the e-learning users under arrangements of the existing resources, new acquisition of e-resources, database subscription, digital library resources, searching facilities of the resources, supporting the faculty CAL, etc. Table 3 indicates the overall values of e-resources in all three categories of respondents. From the overall responses of the students for the e-resources, it can be inferred that the library provided an average level of e-resources for academic work.

Table 3. E-resource rating

E-resources	Students	Academic staff	Library staff
Mean	3.3329	3.3375	3.1137
Median	3.4000	3.5500	3.1000
Std. Deviation	.65767	.43074	.65239
Minimum	1.50	2.40	1.70

Information sharing on new arrivals, OPAC, and electronically guiding services are covered under e-services. E-services ratings by respondents are found to be as follows. The types of e-services have been categorized into different groups. According to the students, it has a mean value of 3.3120, and std. deviation of .67292, which means from 2.63908 to 3.98492. Mean value of the academic staff is 2.88 and std. deviation is .952. It stands at 1.928 – 3.832. Library staff mean value is 2.9911 and std. deviation is .518, i.e. it is in the range of 2.4732 – 3.5091. All these mean value ranges are in the 'Average' level of the scale.

ICT Infrastructure Facilities considered are the availability of ICT infrastructure facilities and acquisitions of modern technological equipment. According to the responses given by all three categories, the mean value of the students' responses (228) is 2.99, while that of Academic staff responses (51) is 3, and that of the Library staff responses (8) is 3.50. All three mean values are in the range of the 'Average' level.

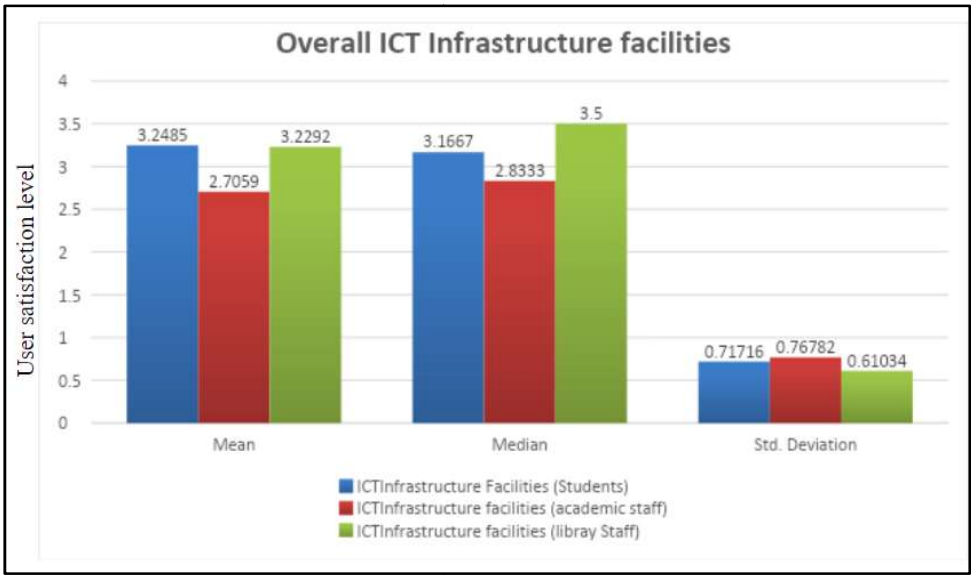

Figure 10. ICT Infrastructure facilities

The roles and skills of information professionals are very important and considered user-friendly services, staff user support, staff skills for user support, training courses and curriculum development activities, introducing learning channels, recommendations for research activities, consultancy for publishing research outcomes, and roles and skills as information professionals. Library staff roles and skills as information professionals have been divided into three main sections such as roles, skills, and professional works. Finally, it has been rated as one set of roles and skills of information professionals.

Management policy was compulsory for academic development related to the modern teaching and learning environment. It was considered relating to the academic staff and library academic and administrative staff to develop academic works. It covered library management policy for user services, and

university management policy for library activities. It indicated the value of the management policy for e-learning support from the university library. The staff have given responses for this, and it has mean values of 3.7386 for academic staff and 3.6667 for the library staff.

In the final section users' general opinions are given below in figure 11., which can help to identify further opportunities. All three categories mean and std. deviation values were mentioned in the table. It shows students' minimum value was 3, the academic staff's minimum value was 3, and the library staff's minimum value was 4. That means all the other values were above 3. On the Likert scale of 5 to 1, 3 was an average level and above, which was a positive level.

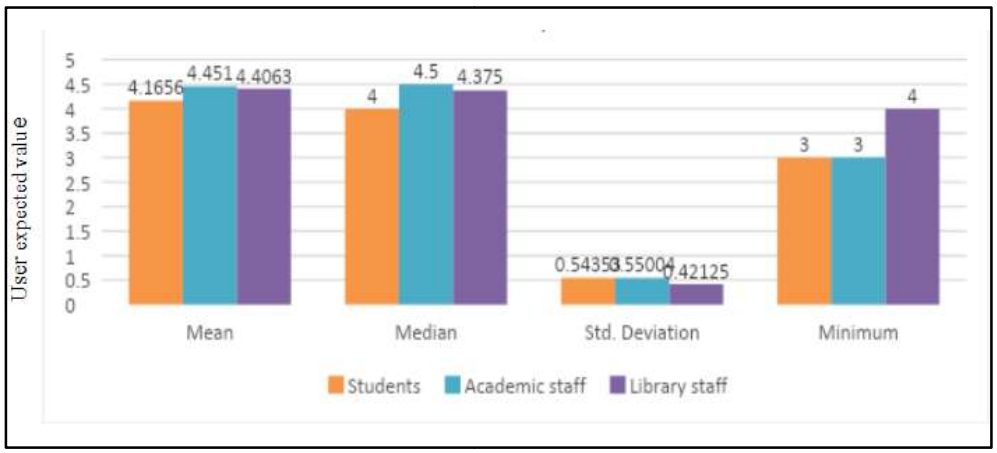

Figure 11. General Opinion on academic library support for E-learning.

Suggestions for Future Development

This study considered suggestions from all three categories of participants for the future development of support of the library towards e-learning. According to the responses, frequency are given below in figures 12 & 13.

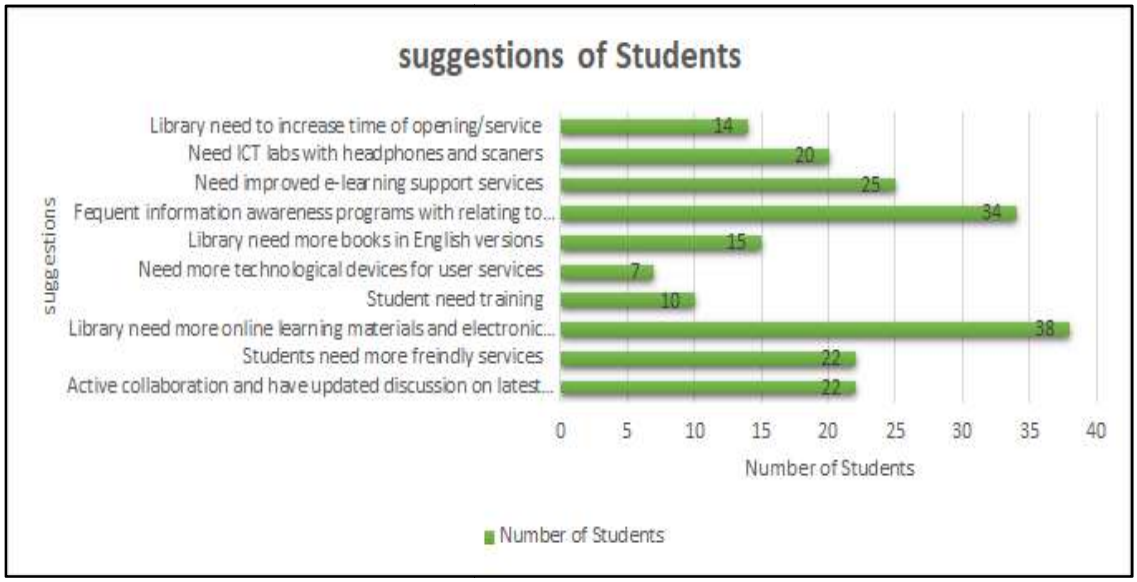

Figure 12. Students' Suggestions

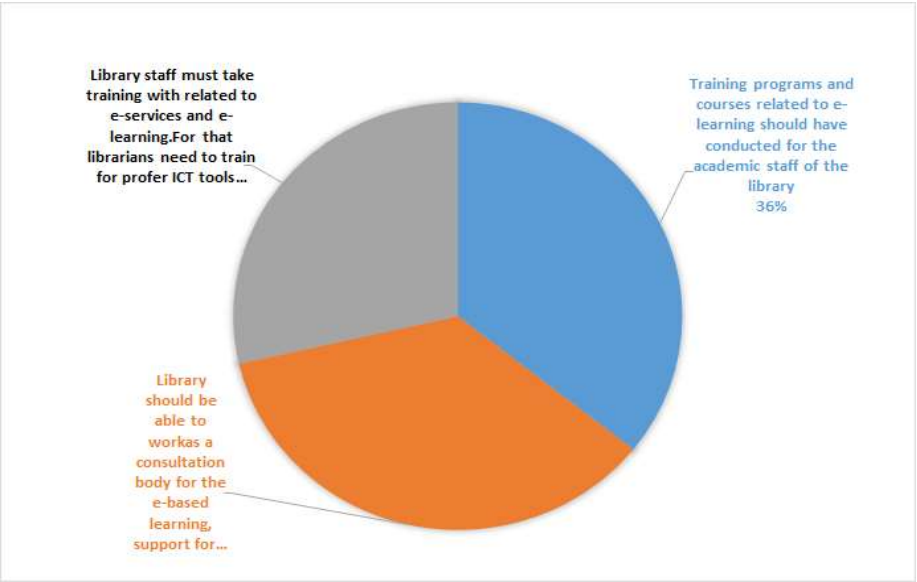

Figure 13. Suggestions of Academic and Administrative Staff

DISCUSSION

The findings were discussed related to the research questions, and connecting the objectives to the literature review. This study addresses the following research questions.

- What is the current situation of academic libraries supporting E-learning in university education in Sri Lanka?
- What are the further opportunities in an academic library to support E-learning in university education in Sri Lanka?

Under the main areas identified, e-resources have considered ten main sub-areas mentioned in figure 3. It shows the findings on Library e-resource ratings by all three categories of participants. E resource rating was at an average level. That means they all have some good experience using e-resources provided by the library. According to the studies, the library should ensure the acquisition of e-learning materials such as e-books, e-journals, databases, and repositories. The resources acquired through the library should meet the needs of academic staff and university students. (Adebayo et al, 2019).

Universities have to conduct teaching, learning, and research studies. Accordingly, the library has to acquire more e-resources like e-journals, e-books, and electronic databases. The Nimbia library started with e-journals and later they developed e-collection to meet user demands. It has indicated the accessibility and value of e-resources for university education, related to the library support for E-learning (Leonard, 2015).

According to self-learning with e-resources, the libraries have to provide self-learning, supportive videos / PowerPoint presentations, and guidelines. The University of Botswana Library has started information services to help users to identify the resources and use them for their studies. This service has been introduced through the library website to assist students and staff to access relevant information according to the users' easy way from remote locations. (Nfila, 2015).

Some users expected access to archival collections for their studies. It shows the preservation of e-resources and access to digital archives. According to Nfila (2015) e-resources and e-services are going together. Using e-resources, libraries can start e-services. The study focused on four main areas to investigate. According to that, e-services are developing students' self-learning activities by conducting hands-on sessions and workshops,

developing Information Literacy skills by conducting short courses and practical sessions, research by conducting courses on literature reviewing, referencing, locating authenticated resources via the Internet, etc. The students' ratings for the above services are at a good level compared to the other two categories (Nfila, 2015).

In quality education, libraries are an essential component. The increasing number of virtual learners needs to demand quality education. The library can offer services remotely (Leonard, 2015). Academic libraries use necessary communication technologies to provide better support for e-learning and e-research by arranging easy access to electronic resources and services (Nfila, 2015).

Most of the users do not know the new arrivals of their libraries each year. Users are expecting to get the new arrival information through email, social media, or library websites. Students' and library staff's responses to the information dissemination services are above the level of 'average'. The academic staff responses regarding this is at an average level. If the library is conducting that as e-services, all the students and relevant faculties can suggest other resources without making any mistakes or delays.

he library OPAC is an important service, which users can view library collections via OPAC. The OPAC is the way the user can find their information sources. That will indicate all the available resources with relevant bibliographic details, and it is accessible to all remotely. According to Nfila (2015), The UB library OPAC service has been introduced as below. "UB Library needs to take a proactive role to ensure access to all electronic resources irrespective of the fact that the University has not yet resolved authentication issues for remote access outside the institution" (Nfila, 2015). Library virtual resources should be accessible to all users without limitations on the physical location and resources (Ojennus, & Watts, 2017).

Libraries electronically guiding the students/staff in avoiding plagiarism in their academic writings are important in this ICT era. That is the responsibility of the library. According to the ratings given by the respondents, it is at an average positive level. Sanjeeva (2018a) has done

research on Research Support Services: From Understanding to Engagement Abstract Methods Funding / Approval. That has been divided into two groups: basic services and specialized services. Some of those services were Federated Search, Information Commons, Information Literacy Tutorials, IR services, Individual research support and guide, Reference Management, Social Media Presence, Specialized Services, Advocacy on Open Access, Assistance in Publication, Copyright and IPR Licensing issues.

This is one way of providing ICT infrastructure facilities for their users. The space at the library to facilitate modern E-learning technical equipment and media devices, facilities for virtual learning by lending (for in-house use) laptops/USB/software for students, Academic research zone for staff with Internet connections, free Wi-Fi, scanners, etc. That indicates students' and library staff' rating of available ICT infrastructure facilities is higher than the academic staff' rating levels.

The University of Botswana Library's vision is to support online learning at the university effectively and efficiently. The idea to transform the UB library into a Learning Resource Centre (LRC) was based on the library's vision to effectively support online learning within the university. The library has to provide more space for ICT facilities and new technology acquisitions. The development of the learning commons provides an opportunity for UB Library to actively integrate resources and services. All the arrangements have been made by meeting the user request/requirements of their learning, teaching, and research activities. The learning commons, IT help desk, Reference desk, academic zone, and other supporting works have been arranged focusing on user support for E-learning in university education. (Nfila, 2015). The ICT-related devices and service users cannot lend as free services. So if the library is providing that kind of service, it will be more beneficial to users (Shavinna, 2001). ICT infrastructure facilities have more value for the library’s support for eLearning. the study of Metega and Bernard (2014) investigates how library service and the E-learning process combined for achieving an improved teaching and learning process in the higher education sector in Tanzania. It has covered new technologies used for library services, software applications, and e-learning processes related to the higher education sector. The survey done by Forsyth, Pizzica,

Laxton, and Mahoney (2010), at Sydney University, Australia mentioned most of the students believed that insufficient technological facilities make problems with distance education. So, providing better ICT infrastructure facilities for users is important to library support for e-learning.

Information professionals have more responsibility. Information professionals' relevant skills and qualifications are vital for the support of user services. Library users expect quality and user-friendly services and guidance. Also, They need helpful and user-friendly services for users to manage their self-learning activities using new technological devices. Academic libraries can play significant roles in collaboration with faculty and the librarians are the leaders of the services (Adebayo et al., 2019). Library staff should have ICT skills and knowledge of new technological devices to support users. Librarians and other staff work as information professionals (Sanjeeva, 2018b).

According to Alfrih, Hepworth, & Goulding (2009), an academic library has an important role to play in supporting the faculties in their teaching and learning activities. The arrangement for existing digital libraries and electronic resources, training on the use of resources, and consultation for research and other related academic work are the most important tasks.

As university library staff, the Librarian, Deputy Librarian, Senior Assistant Librarian, and Assistant librarian play an important role in guiding university library users. They act in different roles. The research found that librarians are developing to provide services in related research areas. The study indicates that 20% of the librarians did not extend any support for the preparatory stage of research (Sanjeeva, 2018b). In the second role as a facilitator, staff should have the ability for introducing different learning channels with continuous updates. As subject specialists, the Librarian and the members of senior academic staff have the ability for assisting and making recommendations for staff and students in the specific research area/ specific learning materials and methods.

As a consultant, the librarian and the senior academic staff must advise staff in publishing their research outcomes with reputed publishers, recognizing and avoiding predatory publishers.

The management policies are only for the academic staff members and the library academic and administrative staff members. Library management policies are important for arranging services. The library should have the policy to make arrangements for flexible support services for physical and virtual learners. The institutional management policies are mainly affecting the libraries. Library and institutional policies should be flexible and more responsive (Husain, S., & Nazim, M. 2015). The parent institutes' management policies affect the sub-institutes run under the main organization. Libraries are working under the rules of the main institution. The university management's actions and decisions are affecting the library and its services. University libraries need to adjust their services and facilities to create supportive learning environments for these students with new learning patterns (The Academic Library in 2010: A Vision, 2005).

Further developments were identified through the user's suggestions. Those suggestions have been made according to the Sri Lankan context. According to that, users, students, and academic staff need active collaboration with friendly services from the university library. They have mentioned more training programmes and more E-learning-related materials with access to the up-to-date collection are required. They have mentioned that user awareness programmes on new resources and existing services are needed. There is a national center for E-learning that is conducting more activities for the secondary level of education in Sri Lanka. If the library is working together with that, users may not get confused when they enter the university library. That was one of the suggestions given by the academic staff of the university. Some of the academic staff have requested for more accurate plagiarism software.

The library can improve services and information awareness through the new social media and email. That may help to save time of the users and the library staff too. The library should align with the academic teaching staff's requirements. Libraries need to have proper collaboration with faculties and academic staff. Libraries need to coordinate the faculty learning management

system (CAL). The library has to go with international university library standards. To develop a research culture in the university, the library should provide access without boundaries. Subscribing more e-journals, databases, and e-books and conducting user awareness programmes for both users and the library staff.

As library staff members, they have mentioned the library should work as a consultant body for e-learning. For that library, the staff needs training programmes, related to E-learning. That can provide complete knowledge for the library, academic, and other staff, and they can provide better service for users without any problem. All three categories of respondents expect proper services from the library. Library staff also have identified some skills to be developed for them.

Conclusion and Recommendations

According to the result identified through the survey, there were categories like e-resources, e-services, ICT infrastructure facilities, roles and skills of information professionals, and Management policy. After analyzing the results, the framework has been revised in figure 14 below.

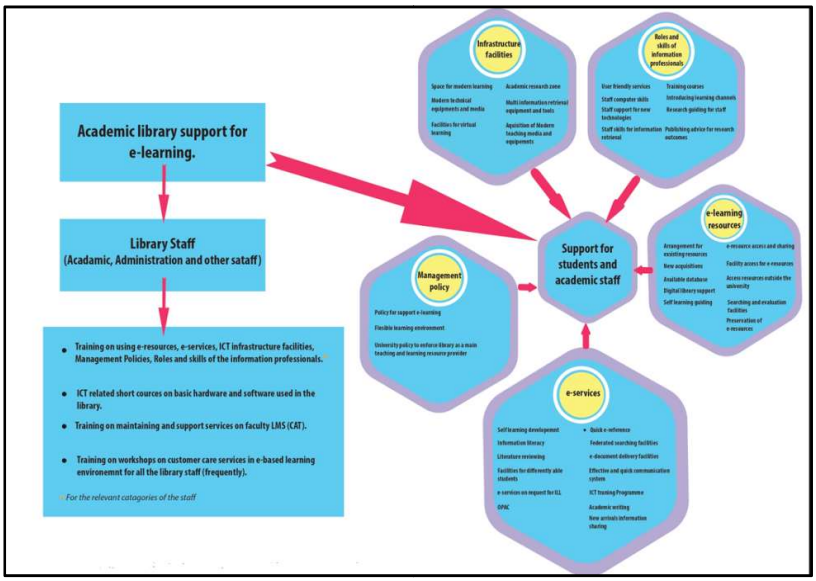

Figure 14. The framework of the Academic library supports E-learning in university education.

According to that, as library users, students and academic staff need to get services from the academic library under the main areas. For better support for E-learning in university education, library staff members (academic staff, administrative staff, Library Information Assistants, and Library Attendants) need to get training and proper knowledge on academic library support for E-learning in university education. That is the backend work process. Those training, workshops, and practical sessions can be arranged by the relevant authorities of the library with the permission and policy arrangements of the main institute. Then only, libraries can provide better services for the university community. All the library staff should be ready for the e-learning support activities.

Limitations of the study.

This research was done as a single case study with the time limitations of the course and had a limitation of time for data collection due to emerging situations in the country.

Recommendations.

Based on the suggestions given by all three groups of respondents, there were important areas on a priority basis. To identify the user requirements, the library needs to arrange a proper communication system among the university library users. The library needs to survey users' electronic-based information needs. Also, the survey needs to proceed to identify the current trends of university user behaviors in order to provide quality services. That will help to organize training programmes on different topics based on user needs.

Nowadays acquiring, e- collections are getting much more beneficial in this digital age. The libraries need to have complete ICT labs with all learning equipment. The users can study using modern learning channels and supplementary DVD/CD also within the library. Otherwise, those audio-visual collections may not be useful. Library collection access requests can be managed with e-collections. The library can provide its services onsite and online. The library can provide virtual services based on user requests. Based on the entire university library system, there is a need to create E-

learning standards and policies exclusively for Sri Lanka. That is a timely need. In the current state university library sector, they do not have policies and standards for such services. However, if they can build up policies and standards, that will help to attend future technology-based matters well.

References

Abeyrathne, D. K., & Ekanayake, S. Y. (2019). The role of academic libraries for augmenting self-directed learning in higher education. *The Reference Librarian*, *60*(1), 14-28.https://doi.org/10.1080/02763877.2018.1530167

Adom, D., & Agyeman, Joe (2018)Theoretical and conceptual framework: mandatory ingredients engineering, International Journal of Scientific Research. 8(2), 8–1

A service framework for libraries. (2006). D-Lib Magazine July/August,.Retrieved from https://doi.org/10.1045/july2006-lavoie.

Arachchi, Siriwardena, Madanayake, R & Dias, K, (2010). Identification of learning styles and learning domains in Sri Lanka in the development of e-learning content, *Advances in ict for emerging regions (icter),* 50-55,

Cheung, M. (2014). Manchester's new order: transforming the academic library support model - Research Libraries UK. https://www.rluk.ac.uk/manchestersneworder/

Colla J MacDonald, Emma J Stodel, Laura G Farres, Krista Breithaupt, Martha A Gabriel, (2001).The demand-driven learning model: A framework for Web-based learning, *The Internet and Higher Education*, 4,(1), 9-30, https://doi.org/10.1016/S1096-7516(01)00045 (https://www.sciencedirect.com/science/article/pii/S1096751601000458)

Conrad, K. (2000). *Instructional design for web-based training*. HRD Press.
Dadzie, Perpetua. (2009). E-Learning and E-Library Services at the University of Ghana: prospects and challenges. *Information Development* - INF DEV. 25. 207-217. 10.1177/0266666909340791.

Prasad, D V ; Rabari,Yash; Singh,Rakesh, Pandey,Abhishek; Kumar,,Pushpak; Thadeshwar, Krunal. Management of chronic osteomylitis by wide debridement and closed suction: Drainage technique. Int J Orthop Sci 2017;3(2):163-168. DOI: 10.22271/ortho.2017.v3.i2c.25

Eklund, J., Kay, M., & Lynch, M. H. (2003). E-learning: emerging issues and key trends. E-learning and e-library services at the university of ghana: prospects and challenges perpetua s. Dadzie first published August 14, 2009, http://journals.sagepub.com/doi/10.1177/0266666909340791.

Engelbrecht, E. (2003). A look at e-learning models: investigating their value for developing an e-learning strategy. Progressio, 25(2), 38–47. Https://doi.org/10.1378/chest.126.3

Epignosis, l. L. C. (2014) 'e-learning concepts, trends, applications, version.file:///C:/Users/ewis/Downloads/E_Learning_Concepts_Trends_Applicationsi.pdf

Garrison, D. R., Anderson, T., & Archer, W. (2000). Critical inquiry in a text-based environment: Computer conferencing in higher education model. *The Internet and Higher Education,* 2(2-3), 87-105.

Ghavifekr, S. & Rosdy, W.A.W. (2015). Teaching and learning with technology: Effectiveness of ICT integration in schools. *International Journal of Research in Education and Science (IJRES),* 1(2), 175-191.

Hall, Budd. (2005). In from the cold? Reflections on participatory research from 1970-2005. *Convergence*. 38. 5-24.

Kapila. (2010). Identification of learning styles and learning domains in Sri Lanka in the development of e-learning content. 10.1109/ICTER.2010.5643270.

Kanaganayagam, I., & Fernando, S. (2013). A framework to analyze the effectiveness of collaborative e-learning (cel) in Sri Lankan university education, 1–8.

Liyanage, I. M. K. (2014) 'Education system of Sri Lanka: strengths and weaknesses'.

Manchester's new order: transforming the academic library support model. Education first sri Lanka.http://doi.org/http://www.moe.gov.lk/sinhala/images/publications/education_first_sl/education_first_sl.pdf.

Maru, H. (2014, May 25). *Academic libraries support for e-learning: Initiatives and opportunities- the case of the University of Botswana Library*. Academia.edu. https://www.academia.edu/4795147/Academic_Libraries_Support_for_Eearning_Initiatives_and_Opportunities_the_case_of_University_of Botswana_Library

Ministry of education. (2017). Education first in Sri Lanka. http://doi.org/http://www.moe.gov.lk/sinhala/images/publications/education_first_sl/education_first_sl.pdf.
A. Nitecki Danuta, & Simpson Katherine. (2016). Communicating the Library as a Learning Environment. *Journal of Learning Spaces*, *5*(2). https://doi.org/10.18057/ijasc.2016.12.3.

Prakash, I. N., (2017). Resource sharing: a library perceptive. International journal of library & information science (ijlis). Vol. 6(1), pp. 19–22, article id: ijlis_06_01_002 http://www.iaeme.com/ijlis/issues.asp.

Proceedings of the IATUL Conferences | Purdue University. (n.d.). Retrieved on January 25, 2023, from https://docs.lib.purdue.edu/iatul/

Punpruk, s. (2004). A research report on student-centered learning and teaching approach for students' skill development in knowledge thinking and construction based on the performance indicators of educational institutions.

Khon Kaen: faculty of education, khon kaen university.

Ratnapala (2014). Adopting e-learning for university education in Sri Lanka: Peradeniya

perspective s.h.i.p. Ratnapala computing center, faculty of engineering, university of Peradeniya, Sri Lanka 2014.
Sagitova, R. (2014). Students' self-education: learning to learn across the lifespan. *Procedia - social and behavioral sciences,152*, 272-277.Doi:10.1016/j.sbspro.2014.09.194

Sanjeeva, M. *(20*18). Academic libraries: challenges changes and choices academic libraries:challenges changes and choices, Emerging Trends, Advancements and Challenges of Academic and Public Libraries 13th and 14th June 2014 ISBN 978-93-84093-13-6.

S. M. Arachchi, M. Siriwardena, R. Madanayake and K. Dias, "Identification of learning styles and learning domains in Sri Lanka in the development of e-learning content," *2010 International Conference on Advances in ICT for Emerging Regions (ICTer)*, Colombo, Sri Lanka, 2010, pp. 50-55, doi: 10.1109/ICTER.2010.5643270
Tsai, Meng-Jung. (2009). The Model of Strategic e-Learning: Understanding and Evaluating Student e-Learning from Metacognitive Perspectives. *Educational Technology & Society*. 12. 34-48.

Tuamsuk, Kulthida & Kwiecien, Kanyarat & Sarawanawong, Jutharat. (2013). A university library management model for students' learning support. *International Information & Library Review.* 45. 94-107. 10.1080/10572317.2013.10766377.

Nfila, R. B. (2015). Academic Libraries Support for E-learning: Initiatives and Opportunities- the case of the University of Botswana Library. 267, 1–14.
https://www.academia.edu/4795147/Academic_Libraries_Support_for_E_learning_Initiatives_and_Opportunities_the_case_of_University_of_Botswana_Library

Yang, N. & arjomand, l. H. (1999). Opportunities and challenges in

computer-mediated business education: an exploratory investigation of online programs, *Academy of educational leadership journal,* 3 (2), 17-29.

Wohlfarth, D.D., shears, D., Bennett, J.L, Simon, B., Pimentel J.H Laura E. G (2008).student perceptions of learner-centered teaching. Insight: *A Journal of scholarly teaching*, 3, 67-74.