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Assessing the Status and Resource Availability in School Libraries for Studying Science Subjects in Public Secondary Schools in Bunda Town Council, Tanzania

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Abstract: *This study assessed the current status of resources availability in secondary school libraries for studying science subjects. The study employed a concurrent triangulation design with a mixed-method approach. The sample of 190 respondents (students, heads of secondary schools, town secondary education officers, ward education officers, and science subjects' teachers) was used to provide their answers to the specific questions of this study. Data were collected with the help of open- and closed-ended questionnaires, interviews and observation The researcher administered 171 questionnaires where 94 were distributed to the students and 77 were distributed to the science subject teachers in five public secondary schools. Nineteen (19) participants were interviewed by the researcher. Participants were selected by using purposive, and simple random sampling techniques. The researcher adhered to ethical issues as data was being collected. The findings from the study revealed that most public secondary schools are not equipped with supplementary books, and computers that would help students in studying science subjects. It was recommended that secondary schools should prioritize the expansion and modernization of their library facilities. This includes investing in a diverse collection of scientific literature, both in print and digital formats to cater for the diverse learning needs of students. It was also revealed that Secondary schools should implement a structured program that integrates library services into the curriculum for studying science subjects.*

Keywords*: Resources, Status, Libraries, Science subjects, and Public secondary schools*

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1. Introduction

Assessing the current status and resource availability in secondary school libraries for studying science subjects' performance is crucial for understanding how institutions support students learning and engagement in STEM subjects (Science, Technology, engineering, and Mathematics). School libraries play an important role in providing access to diverse resources that enhance, yet their effectiveness can vary significantly based on funding, staffing, and resource allocation (Basil, 2012). Access to online databases, e-books, and multimedia resources can significantly enrich students' understanding of complex scientific concepts and foster independent skills. Additionally, the integration of technology in

libraries is essential, as it not only supports curriculum needs but also prepares students for future academic and professional endeavours (Miller & Aagard, 2021). In developed countries, the status and available resources in school libraries for studying science subjects vary significantly reflecting differences in funding, administrative support, and educational policies. In the United States of America (USA), school libraries are increasingly recognized as critical components of STEM education. According to a report by the American Association of School Librarians in 2022, effective school libraries provide access to a diverse range of resources, including digital databases, e-books, and interactive tools, which are essential for fostering scientific inquiry among students (AASL, 2022). In the United Kingdom, the School Library Association (SLA) emphasizes the importance of school libraries in promoting literacy and engagement in STEM subjects. SLA (2023) found that schools with well-resourced libraries report higher student achievement in science subjects. Similarly in Canada, the study found that access to modern library resources, including online scientific journals and collaborative workspaces, significantly impacts students' ability to engage with complex scientific concepts (CSLA, 2023). In Poland, school libraries play an important role in supporting science education, though access to resources can vary across the country. According to recent reports, many Polish secondary schools are equipped with libraries that offer a variety of resources, including science textbooks, journals, and digital materials to aid in science learning. However, there are discrepancies between schools in urban and rural areas, with urban schools often having better access to updated resources and digital tools (Kowalska & Kowalczyk, 2022)

In Africa, the status of school libraries and their resources for studying science subjects in Africa varies significantly across countries, largely influenced by local funding, infrastructure, and policy priorities. In South Africa, however, some schools, particularly in urban areas, have seen improvements in library resources due to government initiatives and NGO support. These libraries are increasingly equipped with science-related resources, such as lab equipment and digital tools, to enhance science learning (Ngubane, 2022). On the other hand, in Nigeria, while school libraries exist, many are inadequately stocked with science resources, limiting students' ability to engage deeply with scientific concepts. According to Akinwale (2023), libraries in Nigerian secondary schools often lack updated textbooks, and where resources are available, their usage is often hindered by poor infrastructure and inadequate training for both students and staff in utilizing these resources effectively. Additionally, In Nigeria, a study conducted by Akintunde and Afolabi (2023), pointed out that many secondary schools do not have functional libraries and those that do often rely on outdated materials. This situation has detrimental effects on students' abilities to engage with scientific content effectively, limiting their exposure to modern scientific discourse. These disparities suggest that while there is a recognition of the importance of library resources in promoting science education, much work remains to be done in ensuring equitable access to these resources across Africa. This gap underscores the need for increased investment in library resources to support science education. In Kenya, studies have shown that school libraries are generally underfunded and lack the necessary resources for effective science education, including textbooks, scientific journals, and internet access for research (Otiato, 2023).

In Tanzania, the status and resources availability in school libraries for studying science subjects present both challenges and potential for improvement. Many secondary schools lack well-equipped libraries, which directly affects the quality of science. According to a study by Msagati and Mwinyimvua (2022), only about 40% of secondary schools in Tanzania have functional libraries, and even fewer possess adequate resources such as updated science textbooks and digital materials. This scarcity significantly limits student access to vital information necessary for understanding complex scientific concepts. Various efforts are underway to enhance the library services within the country. The Tanzania government, through the Ministry of Education, has initiated programs aimed at improving library facilities and resources in schools. These initiatives include training for librarians and the introduction of digital learning tools. A recent report from the Tanzania Institute of Education highlights that schools receiving government support have shown improvements in science literacy, largely due to better library services and access to online scientific journals (TIE, 2023). Furthermore, partnerships with international organizations are helping to bridge resource gaps. For instance, the Global Partnership for Education has funded projects that provide secondary schools with essential library materials, focusing on science education (GPE, 2023). However, despite these efforts, little is known about the status and resources available in school libraries in the Bunda town council. It was on this basis that this study aimed to assess the status and resources availability in school libraries for studying science subjects in public secondary schools in Bunda Town Council.

2. Literature Review

2.1 Theoretical underpinning

Self-Regulated Learning Theory (SRLT) developed by Barry Zimmerman in the 1980s was employed to guide this study. Self-regulated learning (SRL) theory is particularly suitable for studying the status and resources available in school libraries for science subjects because it emphasizes the learner's ability to manage their learning process, particularly in independent and resource-driven environments. SRL involves setting goals, self-monitoring, self-reflection, and seeking resources, all of which are key behaviours when students engage with library materials for science learning (Zimmerman, 2002). A well-equipped library provides resources that can enhance these skills by offering access to diverse learning materials, fostering autonomy, and supporting critical thinking (Pintrich, 2000). SRL allows students to take initiative in exploring scientific topics, developing their problem-solving abilities, and enhancing their academic achievement, particularly when library resources align with the curriculum (Schunk & Ertmer, 2000). Therefore, assessing library resources through the lens of SRL

supports a holistic understanding of how resources influence science education

2.2 Theoretical literature review

Aanu and Olatoye (2011) observed that the use of library resources and study habits are important predictors of science achievements in secondary education. Again, Ivwighreghweta and Igere (2014) also showed in their survey that students who had access to online library resources, textbooks and supplementary books for their academic pursuits had better grades and could learn self-study skills for life-long learning. In the same vein, Anthony (2018) pointed out that the use of library resources and services for secondary school for private studies impacted the academic performance in their subjects, therefore the use of textbooks, novels, dictionaries, newspapers, and atlas found in the school library can help students to acquire different information which can help students in their subjects to expand more knowledge.

Murugan (2019) argued that the use of library services such as internet facilities, textbooks, e-journals, reference materials, and theses or dissertations among university students was high, which enabled students access to different learning materials in their studies. This study ascertains that students used the university library services and resources regularly for their academic, research, and updating their knowledge. Therefore, library services and resources are vital in supporting student learning their academic subjects.

Basil (2012) in his study reveals that the facilities, services, and information resources are the major facets which make more impact on the satisfaction of the users of the library. Information literacy programmes have a direct effect on the utilization of library resources and the usefulness of the library. It includes orientation to library amenities, assets & holding and services & application of information tools to locate the resources. For the optimum exploitation of the academic library, the students should know how to access its resources to their full benefit. Sohail and Pandye (2012) in their study on the use of library resources by the students of the University of Kalyani found that to meet the information needs of students guidance and help are required to use the library resources and services such as textbooks, journals, supplementary books and use of internet services to expand knowledge in their subjects.

2.4 Empirical literature review

In Ghana study conducted by Boakage (2018) on user's satisfaction with library resources and services. The study employed a mixed methods approach. The quantitative data were analyzed descriptively and qualitative data were analyzed thematically. The data were collected through questionnaires and semi-structured interviews. The findings found that large numbers of students were satisfied with library resources and services available in the school library. He also found out that books are the most widely used by users and circulation services are considered as the most preferred services in the library. Users have given suggestions to use library services more efficiently and effectively in their studies to score good performance.

A study conducted in Ghana by Agyekummar and Filson (2012), on the challenges of school libraries in the new educational reforms. The study used a mixed research approach and questionnaires and interviews were used as data collection tools. The quantitative data were analyzed descriptively with the aid of SPSS software and qualitative data were analyzed by using content analysis. The findings indicated that most students use library resources and services to implement their class notes and assignments, and this helps them with examination preparation. This is what is referred to as active learning which the school libraries are to instill in students.

In Tanzania, a study conducted by Bernard and Dulle, (2014) on accessibility of school library information resources in Morogoro municipality. The study employed a mixed methods approach. The qualitative data were analyzed manually by thematic analysis while quantitative data was analyzed by using descriptive statistics with the aid of computer software called SPSS. The findings found that students who were able to utilize resources and services available in the school library such as textbooks and novels performed better in their subjects. This means that library services utilization is very important to enhance and expand understanding of subject matter among secondary school students.

3. Methodology

The study used a mixed method approach to acquire more information during the time of assessing the status and resource availability in school libraries for studying science subjects in Bunda Town Council. The study employed a mixed method approach which assisted in understanding well the study. This is in line with Creswell and Creswell (2018) arguing that the mixed method approach develops a completely considerate study variable. The study employed a convergent parallel design which enabled the researcher to understand the research problem better due to the concurrent collection of data. Probability and non-probability sampling techniques were used to get the participants from a targeted population of where a sample size of 94 students, 77 teachers, 5 heads of public secondary schools, 5 Ward Education Officers, 7 school librarians and 2 Town Secondary Education Officers, making a total of 190 respondents. Questionaire and interview schedules were employed in data collection. Both open and closed-ended questions were directed to teachers and students to gather information. While semi-structured interview was used to extract in-depth data from Town Secondary Education Officers Administrator (TSEO), heads of public secondary schools, Ward Education Officers (WEOs), and school librarians. Content and face validity were checked by research experts to determine the arrangement of the content of the instrument for the study purpose. The trustworthiness of qualitative instruments comprised credibility, transferability, dependability, and confirmability where participants were free to offer information. Data collection methods

included interviews, questionnaires, and observation. Quantitative data were analyzed through descriptive statistics with support of Statistical Package for Social Sciences (SPSS) version 23 and presented in frequency and percentages and tables, the 5-point Likert scale was used as a measurement scale, ranging from 1(strongly disagree) to 5(strongly agree while qualitative data coded were analyzed by themes using the content method in narratives Researcher adhered all ethical consideration issues in the whole process of collection of data from study participants.

4. Results and Discussion

4.1 Demographic characteristics of the respondents

This section presents the demographic characteristics of the respondents who participated in this study. This study used 190 respondents. Thus, under this section age, sex and education level of the respondents are discussed below.

4.2.1 Age and sex of the respondents

Table 1: Demographic characteristics of the respondents

AGE	F	%	SEX	F	%
15-25	94	49.47	MALE	98	51.58
26-35	26	13.68			
36-45	33	17.37	FEMALE	92	48.42
46-55	28	14.74			
56 ABOVE	9	4.74			
TOTAL	**190**	**100.00**		**190**	**100**

Source: Researchers' construct (2024).

The data from Table 1 above shows the demographic characteristics of the respondents (n=190) used in this study. It is revealed that the majority of the respondents were aged between 15-25 years as they take 49.47%. This data communicates that the researchers have used a large sample of students (aged 15-25 years) to provide important information on the utilization of libraries in secondary schools. On the other hand, the majority of the respondents (51.58%) were male compared to 48.42% who were female respondents. Thus, this implies that most of the students who took science subjects were male so were the science teachers.

4.2.2 Education level of the respondents

Table 2: Educational level of the respondents

Variable	F	%
Secondary education	94	49.47
Diploma	35	18.42
Degree	51	26.84
Masters	10	5.26
TOTAL	190	100

Source: Field data, (2024).

The field data as revealed in Table 2 above shows that most of the respondents (49.47%) have secondary education. This is because the study has 94 secondary school students as respondents in this study. However, other respondents hold diplomas, degrees and masters. This implies that secondary schools teacher's minimum entry qualification is a diploma in secondary education thus

teachers and other officials used in this study have enough qualifications.

4.3 The current status and resources availability in secondary school libraries for studying science subjects in public secondary schools

The objective of this study was to assess the current status and resources available in secondary school libraries for studying science subjects. The researcher used questionnaires and interview guides as research tools in the collection of data for this objective. In questionnaires, 171 respondents were asked to respond to statements concerning the current status and resources available in school libraries for studying science subjects in public secondary schools. 94 questionnaires were administered to students and 77 questionnaires were also administered to science teachers in public secondary schools and 19 participants were interviewed.

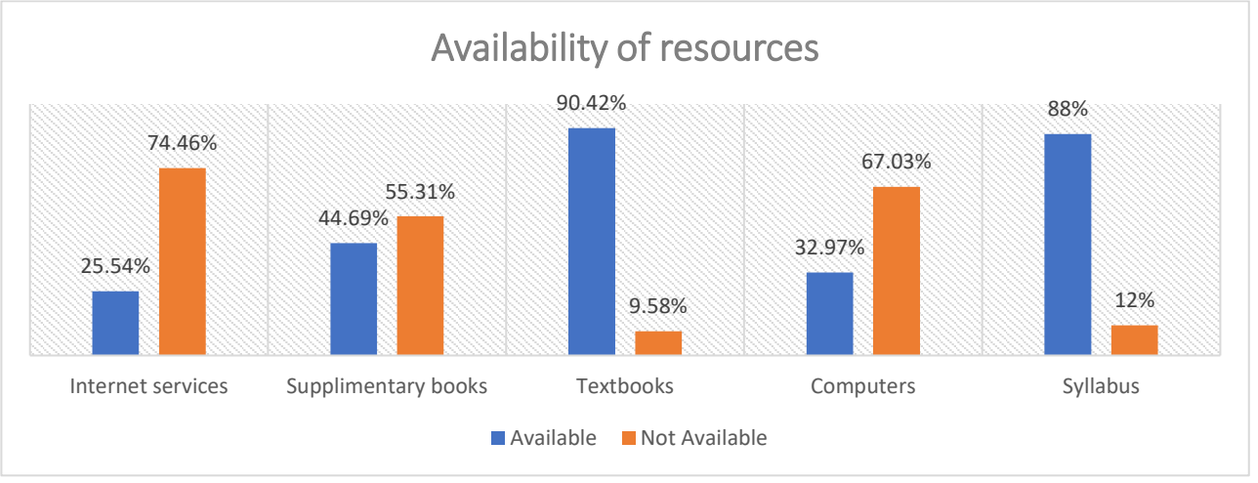

Figure 1: The current status and resources available in secondary school libraries for studying science subjects in public secondary schools (Information was provided by students)

Source: Field data, (2024)

Figure 1 above presents information obtained from the questionnaires filled by the students which reveals that only textbooks (90.42%) and Syllabus (88%) were highly available in most of the public secondary schools' libraries. On the other hand, internet services, Computers and Supplementary books were found unavailable in most public secondary schools.

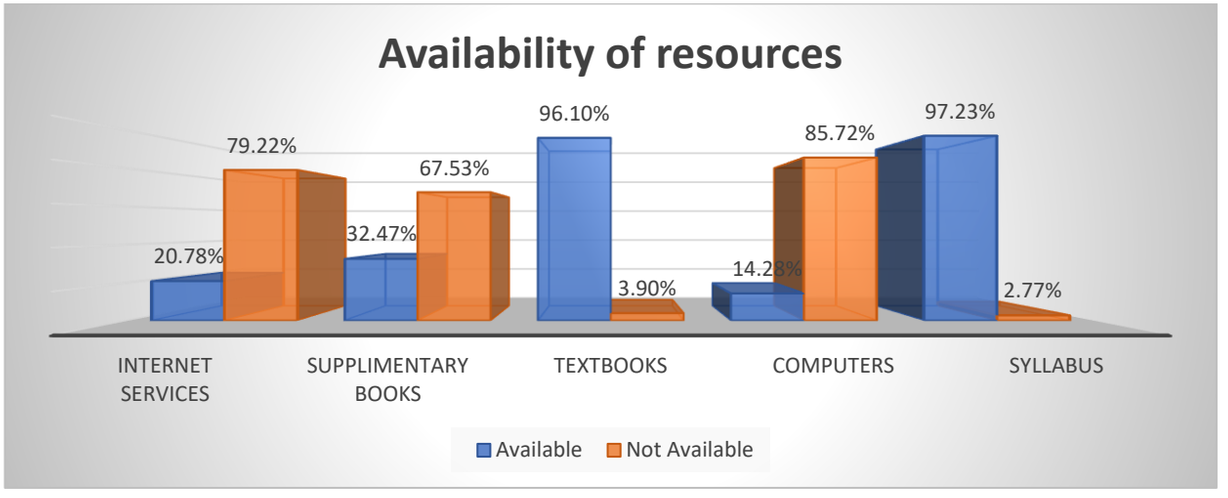

Figure 2: The current status and resources available in secondary school libraries for studying science subjects in public secondary schools (Information was provided by teachers)

Data presented in (figure 2) above reveals that teachers have said that syllabi (97.23%) and textbooks (96.10%) were available in their secondary schools whilst other resources like internet services (20.78%), Supplementary books (32.47%) and Computers (14.28%) were available in some of the public secondary schools in Bunda Town Council.

4.3.1 Internet Services

Research findings have revealed that 14.28% of the students (from Figure 1) and 32.97% of teachers (figure 2) revealed that internet services are available in libraries in a few secondary schools. This implies that most secondary schools' libraries have no internet access that will help students search for important materials in learning science subjects. One of the respondents when asked said;

Participant 1

"*We are lucky that we have a library, but we don't have internet access. It is very difficult for our students to access materials from the internet as currently, the service is unavailable in our school*"

Participant 2 had this to say

"In our school, the internet is not an issue. We have internet service but the issue is all about data bundles. We sometimes don't access the internet because we have limited funds to buy data bundles"

The quoted interviews correlate with data obtained from the questionnaire as stipulated in Figures 1 and 2 above. The majority of secondary schools have no internet services. Astonishingly, the researcher observed that the few schools with internet services, but internet services cannot be accessed. This means that the absence of Internet services in most public secondary schools significantly limits the educational outcomes of students. This digital divide restricts access to online resources, modern learning tools, and collaborative platforms, thereby disadvantaging students in developing critical digital skills essential for future careers. This finding is in line with a study conducted by Hampton et al. (2023) highlights that students with limited internet access develop weaker digital skills, which are crucial for academic success and future employment opportunities. Similarly, Hargittai and Dobransky (2021) emphasize that internet connectivity fosters resource access and improves instructional delivery, directly impacting students' learning outcomes.

4.3.2 Supplementary books

The field data reveals majority of the respondents (55.31% and 67.53%) of students and teachers respectively) argued that supplementary books are not available in libraries. This implies that science students are not equipped with supplementary books to enhance their learning in science subjects the thing that can lead to poor performance in science subjects. Some of the respondents had the following to say when asked:

Participant 3 had this to say

"*As you can see here, our library is not well equipped with supplementary books, especially science subjects. This makes the students rely only on the teacher's teaching notes as their reference*"

Participant 4 had this to say

"Frankly speaking, we have a lot of supplementary books in our library. Our shelves are full of supplementary books for our students to learn"

Participants' views correlate with the findings obtained from the questionnaire which show that supplementary books were available in some of the public secondary schools even though most of the public secondary schools were not equipped with supplementary books. With this data in place, science takers (students) are likely to struggle to find materials from other places. This means that The lack of sufficient supplementary books in public secondary schools has serious implications for student learning and academic achievement. Supplementary books enrich the curriculum by providing diverse perspectives, reinforcing classroom learning, and supporting self-study. Without these resources, students face limited opportunities to develop critical thinking and comprehension skills, which are vital for academic success. This finding is in line with a study conducted by Makotsi (2011) who highlighted that regular access to diverse reading materials significantly enhances literacy, vocabulary acquisition, and comprehension skills, forming the backbone of academic success.

4.3.3 Textbooks

The field data as revealed in Figures (1 and 2) shows that the majority of the respondents (90.42 per cent of students and 96.10 per cent of teachers) have said libraries in their secondary schools are equipped with textbooks for science subjects while the minority of the respondents has argued that textbooks are unavailable in their libraries. This communicates that students have textbooks for their learning in science subjects. Thus, the performance of students in science subjects is likely to be improved with the availability of textbooks.

Participant 5 had this to say

"*We have received enough textbooks from the government in our school. Our ratio is one to five for forms one and two while we have more science textbooks than students in forms three and four"*

Correspondingly, findings given from both questionnaires and interviews show that there were a lot of textbooks in public secondary schools which enable students to learn science subjects, especially for form three and form four students. On the other hand, the researcher observed that the majority of public secondary schools have enough textbooks, but very few numbers of students visit the library to use them in their daily study learning. The availability of textbooks in public secondary schools has significant implications for academic performance and learning quality. This finding is in line with a study conducted by Ivwighreghweta and

Igere (2014) also showed that students who had access to online library resources, textbooks and supplementary books for their academic pursuits had better grades and could learn self-study skills for life-long learning. Additionally, Anthony (2018) pointed out that the use of library resources and services for secondary schools for private studies impacted the academic performance in their subjects, Thus, it can be concluded that most of the libraries in public secondary schools are well equipped with textbooks for learning science subjects.

4.3.4 Computers

The findings as presented in (figure1 and 2) above reveal that many libraries in secondary schools don't have computers for students to learn science whilst only a few respondents (14.28 percent of the teachers and 32.97 *library* percent of the students) revealed that they have computers in their libraries. This implies that computer is not the resource that is available in most secondary school libraries for the students to have access to e-materials for their learning. The researcher had interviews with some of the school heads they quoted saying.

Participant 6 had this to say

"*We don't have computers in our. But we have one for the academic office. The available computer is not accessible to the students as it is only for administration. It is difficult for our students to access e-books that would facilitate their learning in science subjects*"

The findings obtained from questionnaires revealed that public secondary schools have no computers in their libraries while participants interviewed argued that computers are available in their schools even though these computers are for administrative activities issues only. Thus students cannot use them for their studies. This means that computers for students to access learning materials are not available in most of the public secondary schools. The lack of computers in most public secondary schools has several implications for education. As it limits students' and teachers' access to digital resources, which are crucial for learning in the modern era. This gap hinders the development of essential digital literacy skills, making students less prepared for the technology-driven job market. These findings are in line with a study conducted by Hoq (2020) discussed the limited adoption of ICT in secondary schools, noting that inadequate funding and insufficient teacher training significantly hamper the integration of technology in classrooms. This limitation restricts students from gaining essential digital literacy skills and impedes the modernization of teaching methodologies. Additionally, Sohail and Pandye (2012) pointed out that the use the library resources and services is very important for students to expand their knowledge in their subjects.

4.3.5 Syllabuses

The findings presented in (Figure) above indicate that 88% of the students revealed that there is the availability of syllabuses in libraries in some public secondary schools, while (figure 2) above shows that 97.23% of teachers revealed that in most public secondary schools there is the availability of syllabuses. Therefore, the syllabus is very important because it is a guide to both teachers and students on what to be taught and learnt. In the absence of syllabuses, the students cannot attain the required learning outcomes.

Participant 7 had this to say

"*Syllabus is a very important learning material for students and teachers. We have three copies of syllabuses in every subject (science subject included). Students use the available syllabus in the library to identify specific areas that they have to learn*"

The participant above agreed that the syllabus is an important document for both teachers and students in learning science subjects. Some of the respondents have revealed the absence of a syllabus in some secondary schools. The researcher sees the difference in views between teachers and students on the availability of syllabi. Therefore, the availability of syllabuses assists secondary school students by detailing course goals, topics, and evaluation methods, helping them organize their studies. Thus, the result implies that the availability of syllabi helps both students and teachers to identify areas (in science subjects) to be covered. Correspondingly, these findings agree with Murugan, (2019) who posited that library resources are vital in supporting student learning their academic subjects. Moreover, the availability of syllabuses addresses curriculum coherence, ensuring continuity across grade levels. According to the latest reports, schools can enhance educational equity by ensuring that all teachers have access to the same materials, thus minimizing disparities in content delivery (Rajeevelt, 2023; Educationnewshub, 2024). This is crucial for creating a standardized educational experience, helping students from different schools receive similar quality education, regardless of their local infrastructure or resources. Thus, accessible syllabuses play a pivotal role in enhancing overall educational quality and reducing educational inequality.

5. Conclusion and Recommendations

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5.1 Conclusions

The findings reveal a critical disparity in resource allocation among public secondary schools, particularly concerning internet access, supplementary books, and computers. The absence of Internet services restricts students' exposure to global knowledge and diminishes their ability to acquire digital literacy skills vital for 21st-century careers. Without connectivity, teachers face challenges in integrating digital tools into the curriculum, further widening the learning gap. Similarly, the inadequate availability of supplementary books limits students' capacity for self-study and broader understanding beyond the prescribed curriculum. Studies highlight how supplementary materials reinforce learning by offering diverse perspectives, aiding critical thinking, and fostering reading comprehension.

It was revealed that public secondary schools are faced with utilization of library services. This ineffective utilization of library services was not from the vacuum rather there were the main causes of poor performance in science subjects. Findings revealed the current status and resources available in the school library for studying science subjects, the researcher discovered that most of the mentioned causes are lack of internet services in the school library which could help students search different materials for studying science subjects, lack of supplementary books in the school library. Thus, in the presence of these factors, poor science subjects' performance will persist

5.2 Recommendations

The study recommends the following:

1. The study recommended that secondary schools should prioritize the expansion and modernization of their library facilities. This includes investing in a diverse collection of scientific literature, both in print and digital formats to cater to the diverse learning needs of students.
2. Public secondary schools should prioritize the acquisition of updated textbooks, scientific journals, and digital resources to ensure that students have access to current and comprehensive materials.
3. Public secondary schools should consider designating a specific section or creating a resource centre within the library dedicated exclusively to science subjects. This centre would house relevant textbooks, scientific magazines, research papers, multimedia resources and hands-on materials like science knits.
4. Schools should invest in creating a robust digital library, providing students with access to e-books, educational videos, online scientific journals, and interactive platforms. This will allow students to access a broader range of materials beyond the physical limitations of traditional books. Incorporating online databases like JSTOR, Google Scholar, and educational websites will provide students with the latest research, making science learning more comprehensive and up-to-date.
5. Schools should establish a regular evaluation process to assess the effectiveness of library resources for science education. This can be done through surveys, feedback forms, or discussions with students and teachers. By gathering input on the usefulness, accessibility, and variety of resources, the school can make informed decisions on improving or expanding the library's science offering. This feedback loop allows the library to stay aligned with the evolving needs of the curriculum and students' academic interests.

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