



Resource Availability and Students' Achievement in Practical Lessons in Secondary Schools in Iganga Municipal Council

Aisha Mbeya, Musa Kasiita & David Wekhooda Muwoya
Islamic University of Uganda
Email: aishambeya18@gmail.com / ambeya@iuiu.ac.ug

Abstract: *The study was about the correlation between resource availability and students' performance in practical lessons in secondary schools within Iganga Municipal Council. The specific objectives were to evaluate the impact of availability of basic equipment on students' performance in practical lessons in secondary schools, and to identify the presence of skilled human resources to enhance the teaching and learning process for students in these practical lessons. The study employed a cross-sectional descriptive design with a sample of 92 respondents, relying solely on a questionnaire for data collection. We presented the findings in summary tables, showing mean and standard deviation. The study revealed that availability of basic equipment enhances students' achievement in practical lessons through; use of technology to ease tasks, workplace safety, and well-equipped laboratories. The rise of blended learning environments in higher education necessitates adequate equipment, flexible teaching, and investment in educational resources. On the other hand, availability of trained human resource helps to promote inclusive education and enhance instruction quality. Active student participation, communication skills, and respect for different perspectives encourage learning. Teaching methodology and student motivation are crucial for academic success. Curriculum reform should incorporate critical thinking skills for success. Conclusively, the study emphasizes the importance of practical lesson equipment, technology availability, workplace safety, well-equipped laboratories, inclusive education, teacher self-efficacy, professional development, student participation, and curriculum reform. Teachers should allocate resources effectively, foster critical thinking, and provide personalized feedback to enhance student motivation and success, which in turn leads to academic and real-world success.*

Keywords: Resource, Student, Secondary School, Performance, Iganga, Council

How to cite this work (APA):

Mbeya, A., Kasiita, M. & Muwoya, D. W. (2024). Resource availability and students' achievement in practical lessons in secondary schools in Iganga Municipal Council. *Journal of Research Innovation and Implications in Education*, 8(4), 521 – 530. <https://doi.org/10.59765/vpr329ws>.

1. Introduction

Since the early 18th century, teachers and researchers have analyzed the importance of practical work and its vital contribution to scientific fields such as chemistry and biology (Shana & Abulibdeh, 2020). Multiple studies demonstrate that practical work has numerous advantages, including the improvement of laboratory skills, scientific knowledge, and understanding of scientific concepts and theories (Yang et al., 2021).

Practical activities have effectively cultivated students' positive attitudes and enhanced motivation for successful learning in science. An affirmative disposition about the importance of practical labor markedly impacts students' advancement in science (Abaniel, 2021). Empirical research has shown that practical work improves students' communication skills, aids in problem-solving in science, and therefore boosts their enthusiasm in the topic. Furthermore, practical activities invigorate and

amplify students' love for science, rendering it an attractive field (Hinne, 2017).

Many low-income countries have made substantial advancements in attaining universal access to primary education. Concerns are rising that youth are attaining insufficient information, with millions lacking essential reading and numeracy skills despite years of education (Patterson et al., 2024). A slow start to schooling indicates that many students do not develop essential skills. In sub-Saharan Africa, less than 7% of late primary school students display reading ability, whereas 14% show proficiency in mathematics (Patterson et al., 2024). The current discussion of education and international development emphasizes the 'global learning crisis' (Abaniel, 2021).

The efficacy of practical education in Ugandan secondary schools is inconsistent; certain institutions have robust programs that provide students with vital hands-on experience and skills, whereas others lack the requisite resources and infrastructure for effective implementation (Ayikoru, 2024). Moreover, disparities may be present in the quality of practical education offered by urban vs. rural institutions. There exists an opportunity to improve the assurance that all students get high-quality practical education that prepares them for labor market requirements (Layne et al., 2023). Although several secondary schools report the existence of practical work programs, many contend that the implementation of such work is insufficient. However, the lack of documented evidence to demonstrate these gaps renders the advocacy for interventional strategies impracticable. This study marks substantial progress in comprehending the influence of resource availability on student performance in practical courses inside secondary schools in Iganga Municipal Council, where no previous research has been conducted (Buluma et al., 2022).

1.2 General Objective

The study was set to assess the relationship between resource availability and students' achievement in practical lessons in secondary schools in Iganga Municipal Council.

1.3 Specific Objectives

1. To assess the availability of basic equipment on students' achievement in practical lessons in secondary schools in Iganga Municipal Council
2. To determine the availability of trained human resource to facilitate the teaching and learning students' achievement in practical lessons in secondary schools in Iganga Municipal Council

2. Literature Review

2.1 Availability of basic equipment and students' achievement in practical lessons in secondary schools

Balalle (2024) asserts that digital technologies are essential in the educational process. Contemporary educational frameworks depend on digitalization, providing teachers and learners with comprehensive information and communication tools both within and beyond the classroom. This improvement enhances accessibility for students, fosters individualized learning, and facilitates the seamless exchange of information, leading to diverse educational opportunities and an improved educational environment. Furthermore, digital technology significantly influences students' academic pursuits, cognitive abilities, and creative expression while facilitating the implementation of successful pedagogical strategies.

The accessibility and efficacy of safety devices in chemistry laboratories are essential for maintaining a secure working environment for both students and personnel. Public education institutions in Ghana have distinct problems in sustaining and improving laboratory safety due to limited resources and infrastructural deficiencies (Ansah et al., 2024). Research demonstrates that the efficacy of safety equipment in chemical research is contingent upon aspects such as availability, correct utilization, and compliance with safety protocols. Research indicates considerable inequalities in the accessibility of contemporary safety equipment at these colleges (Agyei et al., 2021). Financial limitations and insufficient prioritizing have resulted in the poor provision of necessary safety equipment, such as fume hoods, safety showers, and eyewash stations.

Blended learning is defined as the combination of in-person classroom instruction with online educational activities. Technological improvements and the need to support contemporary learners in their academic pursuits have driven the rising use of blended learning environments in higher education in the twenty-first century. Numerous research studies indicate that blended learning might enhance academic performance. Blended learning employs technology to accommodate diverse learning styles and requirements, engage students, and reinforce educational objectives and ideas (Bouilheres et al., 2020).

A comprehensive understanding of pedagogical strategies is essential prior to enhancing a new immersive blended learning environment. A flexible teaching approach customized to the distinct requirements and learning contexts of students is essential (Bidarra & Rusman, 2016). Issues arising from the intricate network

of relationships essential for providing relevant information occasionally obstruct the educational component (Bizami et al., 2022). Moreover, discussions about the immersive blended learning environment often overlook several critical elements of the creative learning methodology, such as novel interaction techniques among the 'instructor-student-resource' in educational practice (Bizami et al., 2022).

Recent data suggests that higher education has a limited impact on innovation (OECD, 2017b). This process requires the generation of knowledge and, crucially, its appropriate application to address our existing difficulties (Silvestre & Țircă, 2019). Governments and public administrations strive to align education systems with societal and industrial priorities. The future configuration of labor market needs is unclear and contingent upon several unforeseen causes; yet there is a distinct deficiency of suitable workers to occupy the growing number of positions associated with rising technology and worldwide social transformations. The most sought-after expertise and abilities reside in emerging technological fields (Petroni, 2019).

A challenge in comprehending mathematics is the inability to picture topics pertaining to the physical realm. All mathematical concepts rely on representations, as there are no tangible "objects" to display; comprehension must occur through representational frameworks. Challenges persist among secondary school students, especially first-year STEM students. Despite choosing a scientific discipline, many students lack adequate mathematics skills. Some individuals may have a negative association with mathematics (Silvestre & Țircă, 2019).

2.2 Availability of trained human resource to facilitate the teaching and learning and students' achievement in practical lessons in secondary schools

İlik and Sarı (2017) contend that teachers of inclusive education must adeptly employ methods and approaches relevant to the program's content to create a high-quality environment, identify individuals needing special education, and implement the principles of inclusive education. Additionally, IEP teams must carry out student performance assessments and formulate, implement, and evaluate Individualized Education Programs (IEPs). Upon reviewing the research, teachers lack sufficient knowledge in the production of IEPs.

Teacher self-efficacy in classroom management is a vital component of teachers' identity, impacting the quality of their instruction (Lazarides et al., 2020). Contextual variables are theoretically important in the development of self-efficacy and its ensuing implications. However, we still lack a thorough understanding of the relationship

between work resources and expectations about teacher self-efficacy, as well as its impact on teachers' professional behavior. Effective classroom management is a crucial concern for newbie teachers and profoundly influences both instructors' well-being and students' academic performance. Professional competence views teachers' self-efficacy in classroom management as a crucial element and a strong predictor of effective management strategies (Graham et al., 2020).

A crucial causative factor in the overall performance of students in higher education is their engagement (Xerri et al., 2018; Derakhshan, 2021). Research commonly recognizes that students who actively participate in their education and demonstrate excitement are more likely to achieve higher levels of success (Wang et al., 2021). Thus, higher education institutions advocate for the utilization of students' abilities in conjunction with educational opportunities and resources that enable active participation (Xie and Derakhshan, 2021). Moreover, students' dissatisfaction, boredom, negative experiences, and school dropout rates are partially due to a lack of engagement in academic activities (Derakhshan et al., 2021). Scholars have demonstrated a direct and indirect link between engagement and intellect, curiosity, motivation, and the pleasure of learning outcomes across various academic fields (Yin, 2018).

The persistent COVID-19 pandemic and the global ramifications of the Fourth Industrial Revolution impact 21st-century students. Policymakers, teachers, and intellectuals are grappling with the appropriate educational responses to contemporary concerns. Mfaume and Bilinga (2016) proposed addressing Asia's substantial shortcomings in basic education by equipping pupils with 21st-century competencies, such as interdisciplinary thinking, creativity, critical analysis, resilience, and cross-cultural abilities (Tan et al., 2020). The aims of education for sustainable development (ESD) are to provide individuals with the attitudes, skills, and knowledge required to make informed decisions that benefit themselves and others, both now and in the future, and to act upon these decisions. In 2017, Shaaruddin and Mohamad did a study on the effectiveness of active learning strategies. They found that a good learning environment, direct interaction between teachers and students, good communication skills, and respect for different points of view all make students more interested in learning activities and encourage participation.

Although critical thinking has been a historical focus in research, it has recently attracted more attention from scholars and teachers as an essential talent for 21st-century learners. Curriculum reform based on essential competencies in education should fundamentally incorporate critical thinking, as students equipped with these skills can understand the significance of knowledge and effectively address real-life problems, even if they forget the knowledge itself. Many researchers have strongly endorsed the view that teachers can teach and

learn critical thinking through curriculum, encouraging them to cultivate it in students. Within the realm of educational practice, there are three classifications of courses aimed at teaching critical thinking (Bidarra & Rusman, 2016).

3. Methodology

3.1 Research design

This study adopted a cross-sectional survey research design and this involved collecting data from many different individuals at a single point in time. The

quantitative approach measured the descriptive results for the study objectives.

3.2 Study population and Sample Size

The population of schools indicates three selected secondary schools in Iganga Municipal Council, Iganga District labelled as, school A, School B, and school C. The sample size was based on Krejcie and Morgan's (1970) table of sample size determination for each of the population sizes (see Table 1).

Table 1: Sample Size Determination

School	No. of Respondents	Sample (n)	Sampling Technique	Instrument
A	42	36	Census and simple random	Questionnaire
B	28	24	Census and simple random	Questionnaire
C	36	32	Census and simple random	Questionnaire
Total	106	92		

Source; Krejcie and Morgan (1970) for sample size, and the researcher for techniques of sampling. The sample size was 92

3.4 Instruments of Data Collection

Self-Administered Questionnaire (SAQ). The researcher prepared a set of structured questions for respondents in secondary schools. The questionnaire was structured into sections: Section A contained questions about respondents' social demographic characteristics, Section B for the dependent variable (content of the lower secondary school curriculum), sections D contains items on the independent variable (lesson planning). The composition of the questionnaire was in such a way that each of the questions about the main study variables were rated on a Linkert scale running from 1-Strongly Disagree, 2-Disagree, 3-Not sure, 4-Agree and 5-Strongly Agree.

assessed the items using a panel of five lecturers with doctorates in education and were required to give their views concerning appropriateness of each item. From the results obtained, some of them modified a few statements and many of the statements remained still.

On the other hand, questionnaires were piloted in schools other than those of the study to test respondents' understanding of questions in the questionnaire. Tested questionnaires were rated. The researcher used Cronbach Alpha (α) coefficients to determine the reliability of the instrument. According to Cronbach, for an instrument to be reliable, its Alpha value was at least from .70 and above. Cronbach Alpha's scale of measuring reliability indicates that any scores less than .60 is an unacceptably low reliability, 0.60-0.69 defines marginally reliable results, 0.70-0.79 describes reliable results, 0.80-0.90 scale describes highly reliable results and >0.90 is a scale for very highly reliable. The results for reliability were as indicated in Tables below.

3.5 Validity and Reliability Tests

Validity refers to how a test measures what it is purported to measure. A pilot study was conducted and findings subjected to tests. For quantitative data, the researcher

Table 2: Reliability of Findings

Variable	No. of Items	Cronbach Alpha	Cronbach Alpha on standardized items
1. Availability of equipment	6	0.797	0.795
2. Availability of trained human resource	5	0.708	0.765

According to the results in the table above, it can be concluded that the availability of equipment has a higher level of reliability compared to the availability of trained human resources. The Cronbach Alpha values for both variables are above 0.7, indicating acceptable internal consistency. This suggests that the data collected on these variables is reliable and consistent. Further analysis

can be conducted to determine the impact of these factors on the overall outcome of the study.

3.6 Data Presentation and Analysis

Quantitative data were entered into statistical package for social sciences (SPSS) to generate inferential statistics with guidance from an experienced statistician.

Items were rated using mean and standard deviations. Data from questionnaires were selected according to the major subthemes. Findings from demographic characteristics were entered into computer using the statistical package for social sciences spreadsheet version 22 and automatically generate frequencies and line percentages. Results were presented in summary tables to show the frequency and score rates in ascending order. Presentation of results of the study were also strengthened by use of mean and standard deviation. The interpretation scale was as per Amal (2016) whereby mean scores: From 1 to 1.80 represents (strongly disagree), from 1.81 until 2.60 represents (do not agree), from 2.61 until 3.40 represents (true to some extent), from 3.41 until 4.20 represents (agree), and from 4.21 until 5.00 represents (strongly agree).

The confidence interval of results was used to analyze the findings and determine the level of certainty in the data. This statistical measure provided a range of values within which the true population parameter was likely to fall. By considering the confidence interval, the researcher was able to assess the precision and reliability of the study's results, making them more confident in the conclusions drawn from the data.

3.7 Ethical Considerations

Participation in the study was voluntary and if for any reason the participants wanted to withdraw, they could do so. Anonymity was maintained by not asking the respondents to write their names on the questionnaires. There was no known physical or psychological harm to

the respondents by participating in this study. Respect and dignity were put into consideration when setting the questionnaires. All respondents and participants were accorded equal treatment to enable each of them to participate willingly without bias and unrealistic expectations.

In addition, all researchers, and scholars whose work is referred to in this study were quoted/acknowledged and cited accordingly. The researcher ensured that findings are reported in exactness to avoid fabrication of information through presentation of fraudulent results. Each participant or respondent was allowed to withdraw from the exercise at any level, in case they wished to.

Right from the beginning of the data collection process, the researcher continuously sought the consent of the participants and respondents by establishing rapport with them and declaring the intentions of the research project. It was also important to seek permission of the respondents and participants to make recordings, photograph, or video coverage.

4. Results and Discussion

This includes demographic characteristics and findings as per research objectives

4.1 Demographic Characteristics

These are basically in the form of age and gender as indicated in tables 3 and 4.

Table 3: Age-group of respondents

Age-group of Respondents		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	less than 18Years	20	21.7	21.7	21.7
	18-39 Years	26	28.3	28.3	50.0
	40-50 Years	34	37.0	37.0	87.0
	>50 years	12	13.0	13.0	100.0
	Total	92	100.0	100.0	

The data in Table 3 shows the distribution of respondents by age group. The majority of respondents, 37%, fall in the 40-50 years age group, followed by 28.3% in the 18-39 years age group. Only 13% of respondents are over

50 years old. Overall, the data is fairly distributed across the age groups, with a total of 92 respondents included in the analysis.

Table 4: Gender of respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	54	58.7	58.7	58.7
	Female	38	41.3	41.3	100.0
	Total	92	100.0	100.0	

These results show that the majority of the respondents were male, accounting for 58.7% of the total sample. On the other hand, females made up 41.3% of the

respondents. Overall, the sample size consisted of 92 individuals, with each gender represented in varying proportions.

4.2 Availability of basic equipment and students' achievement in practical lessons in secondary schools

The findings to this objective were established using six items with results as indicated in Table 5.

Table 5: Availability of equipment and achievement in practical lessons

Availability of equipment and achievement in practical lessons	N	Min	Max	M	SD
1. Digital technologies are essential in the educational process and promote good grades in practical lessons	92	1.00	5.00	3.84	0.94
2. Accessibility and efficacy of safety devices in chemistry laboratories are essential for maintaining a secure working environment for both students and personnel	92	1.00	5.00	3.63	0.89
3. Technological improvements and the need to support contemporary learners in their academic pursuits have driven the rising use of blended learning environments in higher education in the twenty-first century.	92	1.00	5.00	3.82	1.05
4. A flexible teaching approach customized to the distinct requirements and learning contexts of students is essential	92	1.00	5.00	3.76	0.86
5. Governments and public administrations strive to align education systems with societal and industrial priorities	92	1.00	5.00	3.57	0.94
6. comprehension must occur through representational frameworks	92	1.00	5.00	3.83	0.81

The findings regarding the impact of equipment availability on students' achievement in practical lessons, taking into account the essential role of digital technologies in the educational process and their promotion of good grades, yielded a mean rating of 3.84 and a standard deviation of 0.94, indicating satisfactory results. With access to practical lesson equipment, students are more likely to perform well academically. The correlation between technology availability and academic success is evident in these findings, suggesting that schools should prioritize providing students with the tools they need to succeed. Balalle (2024) asserts that digital technologies are essential in the educational process. Contemporary educational frameworks depend on digitalization, providing educators and learners with comprehensive information and communication tools both within and beyond the classroom.

The study rated the impact of having access to appropriate tools on students' performance in practical classes with a mean score of 3.63 and a standard deviation of 0.89, indicating that the results were satisfactory. This is due to the belief that ensuring the accessibility and functionality of safety equipment in chemistry labs is crucial for maintaining workplace safety for both students and staff. We can infer that students perform better in practical lessons when they have easy access to the necessary equipment. This highlights the importance of investing in well-equipped laboratories to ensure a safe and productive learning environment for all involved. Public education institutions in Ghana have distinct problems in sustaining and improving laboratory safety due to limited resources

and infrastructural deficiencies (Ansah et al., 2024). Research demonstrates that the efficacy of safety equipment in chemical research is contingent upon aspects such as availability, correct utilization, and compliance with safety protocols. Additionally, the positive rating suggests that we should continue and prioritize efforts to improve the accessibility and efficacy of safety devices in chemistry labs for the benefit of student achievement.

Further, the findings suggest that the availability of equipment influences students' achievement in practical lessons. This is in line with the view that technological improvements and the need to support contemporary learners in their academic pursuits have driven the rising use of blended learning environments in higher education in the twenty-first century. The findings received a rating of mean = 3.82 and standard deviation of 1.05, indicating satisfactory results. The implication is that students' academic performance positively benefits from the presence of adequate equipment in practical lessons. Numerous research studies indicate that blended learning might enhance academic performance. Blended learning employs technology to accommodate diverse learning styles and requirements, engage students, and reinforce educational objectives and ideas (Bouilheres et al., 2020). This suggests that investing in up-to-date technology and resources for students can lead to better learning outcomes and overall success in higher education. As the demand for blended learning continues to grow, ensuring that students have access to the necessary tools and equipment will be crucial for their success in the modern academic landscape.

Furthermore, the findings suggest that the availability of equipment influences students' achievement in practical lessons. This is in line with the belief that a flexible teaching approach tailored to the unique requirements and learning contexts of students is essential. The results received a mean rating of 3.76 and a standard deviation of 0.86, indicating satisfactory results. By implication, this suggests that having access to appropriate equipment can positively impact student performance in practical lessons. A flexible teaching approach customized to the distinct requirements and learning contexts of students is essential (Bidarra & Rusman, 2016). Issues arising from the intricate network of relationships essential for providing relevant information occasionally obstruct the educational component. This underscores the importance of schools and educational institutions investing in resources and facilities that support hands-on learning experiences for students.

Furthermore, the findings suggest that the availability of equipment influences students' achievement in practical lessons, particularly in light of governments and public administrations' efforts to align education systems with societal and industrial priorities. These findings received a mean rating of 3.57 and a standard deviation of 0.94, indicating satisfactory results. Teachers and policymakers generally agree that equipping students with practical tools and equipment is essential for their academic success. Recent data suggests that higher education has a limited impact on innovation (OECD, 2017b). This process requires the generation of knowledge and, crucially, its appropriate application to

address our existing difficulties (Silvestre & Țircă, 2019). Governments and public administrations strive to align education systems with societal and industrial priorities. This finding underscores the importance of investing in educational resources and infrastructure to ensure that students have access to the materials and technology they need to excel in their studies.

Finally, the results about the idea that having the right tools affects how well students do in practical lessons were rated with a mean score of 3.83 and a standard deviation of 0.81, which means that the results were acceptable. We can infer that having adequate equipment in practical lessons positively influences students' achievement. Challenges persist among secondary school students, especially first-year STEM students. Despite choosing a scientific discipline, many students lack adequate mathematics skills. Some individuals may have a negative association with mathematics (Silvestre & Țircă, 2019). This suggests that providing students with the necessary tools and resources can enhance their understanding and performance in hands-on activities.

4.3 Availability of trained human resource to facilitate the teaching and learning and students' achievement in practical lessons in secondary schools

This was established using five items as indicated in Table 6 below.

Table 6: Availability of trained human resource and achievement in practical lessons

Influence of trained human resource on students' achievement in practical lessons	N	Min	Max	M	SD
1. Teachers of inclusive education adeptly employ methods and approaches relevant to the program's content to create a high-quality environment	92	1.00	5.00	3.92	0.81
2. Teacher self-efficacy in classroom management is a vital component of teachers' identity, impacting the quality of their instruction	92	1.00	5.00	3.81	0.75
3. Institutions advocate for the utilization of students' abilities in conjunction with educational opportunities and resources that enable active participation	92	1.00	5.00	3.84	1.04
4. Direct interaction between teachers and students, good communication skills, and respect for different points of view all make students more interested in learning activities and encourage participation	92	1.00	5.00	3.47	1.13
5. Curriculum reform based on essential competencies in education should fundamentally incorporate critical thinking, as students equipped with these skills	92	1.00	5.00	3.82	1.07

The results regarding the idea that trained human resources enhance students' achievement in practical lessons when Teachers of inclusive education adeptly employ methods and approaches relevant to the program's content to create a high-quality environment,

receiving a rating of mean = 3.92 and standard deviation of 0.81. The results were agreeable, which indicates that the correlation between trained human resource and student achievement in practical lessons is significant. This suggests that the implementation of effective teaching strategies by Teachers of inclusive education

can have a positive impact on student learning outcomes. The findings support the importance of ongoing training and professional development for teachers in order to improve the overall quality of education for all students. İlik and Sari (2017) contend that teachers of inclusive education must adeptly employ methods and approaches relevant to the program's content to create a high-quality environment, identify individuals needing special education, and implement the principles of inclusive education.

Results regarding the idea that trained human resources enhance students' achievement in practical lessons when Teacher self-efficacy in classroom management is a vital component of teachers' identity, impacting the quality of their instruction received a rating of mean = 3.81 and standard deviation of 0.75. The results were agreeable. By implication, these findings suggest that teachers who are confident in their ability to effectively manage their classrooms are more likely to provide high-quality instruction, leading to improved student achievement in practical lessons. This highlights the importance of investing in professional development opportunities for teachers to enhance their classroom management skills and ultimately benefit student learning outcomes. Additionally, these results emphasize the significant role that teacher self-efficacy plays in shaping the overall educational experience for students. Teacher self-efficacy in classroom management is a vital component of educators' identity, impacting the quality of their instruction (Lazarides et al., 2020). Contextual variables are theoretically important in the development of self-efficacy and its ensuing implications. However, we still lack a thorough understanding of the relationship between work resources and expectations about teacher self-efficacy, as well as its impact on teachers' professional behavior.

Further, results regarding the idea that trained human resources enhance students' achievement in practical lessons when institutions advocate for the utilization of students' abilities in conjunction with educational opportunities and resources that enable active participation received a rating of mean = 3.84 and standard deviation of 1.04. The results were agreeable. By implication, it can be inferred that investing in training for human resources within educational institutions can lead to improved student performance in practical lessons. This suggests that when students are given the tools and support to actively engage in their education, they are more likely to succeed. Overall, the findings support the importance of recognizing and utilizing students' abilities in conjunction with proper resources for optimal academic outcomes. A crucial causative factor in the overall performance of students in higher education is their engagement (Xerri et al., 2018; Derakhshan, 2021). Research commonly recognizes that students who actively participate in their education and demonstrate excitement are more likely to achieve higher levels of success

Furthermore, results regarding the idea that trained human resources enhance students' achievement in practical lessons when Direct interaction between teachers and students, good communication skills, and respect for different points of view all make students more interested in learning activities and encourage participation, receiving a rating of mean = 3.47 and standard deviation of 1.13. The results were neutral. By implication, the study suggests that while trained human resources may have some positive impact on students' achievement, they may not be a significant factor in practical lessons. This implies that other factors, such as teaching methodology or student motivation, may play a more crucial role in determining academic success in these types of classes. Mfaume and Bilinga (2016) proposed addressing Asia's substantial shortcomings in basic education by equipping pupils with 21st-century competencies, such as interdisciplinary thinking, creativity, critical analysis, resilience, and cross-cultural abilities (Tan et al., 2020). The aims of education for sustainable development (ESD) are to provide individuals with the attitudes, skills, and knowledge required to make informed decisions that benefit themselves and others, both now and in the future, and to act upon these decisions.

Further, results regarding the idea that trained human resources enhance students' achievement in practical lessons when Curriculum reform based on essential competencies in education should fundamentally incorporate critical thinking, as students equipped with these skills received a rating of mean = 3.82 and standard deviation of 1.07. The results were agreeable. By implication, incorporating critical thinking skills into the curriculum can lead to improved student performance in practical lessons. Many researchers have strongly endorsed the view that educators can teach and learn critical thinking through curriculum, encouraging them to cultivate it in students. Within the realm of educational practice, there are three classifications of courses aimed at teaching critical thinking (Bidarra & Rusman, 2016). This suggests that focusing on essential competencies in education, such as critical thinking, can have a positive impact on student achievement. Moving forward, it would be beneficial for teachers to continue emphasizing the development of these skills to further enhance student learning outcomes.

5. Conclusion and Recommendations

5.1 Conclusion

The study found that the availability of practical lesson equipment significantly impacts students' academic performance. The correlation between technology availability and academic success is evident, suggesting that schools should prioritize providing students with the necessary tools. Access to appropriate tools is crucial for maintaining workplace safety, and investing in well-equipped laboratories can improve student achievement.

The rise of blended learning environments in higher education in the twenty-first century has driven the need for adequate equipment, which can lead to better learning outcomes and overall success. A flexible teaching approach tailored to students' unique requirements is also essential. Investing in educational resources and infrastructure can ensure students have access to the necessary materials and technology. Lastly, having the right tools affects students' performance in practical lessons, suggesting that providing students with the necessary tools and resources can enhance their understanding and performance in hands-on activities. Future research could explore how different types of equipment or varying levels of access may further influence student outcomes in practical lessons.

The study found that trained human resources significantly enhance students' achievement in practical lessons when inclusive education teachers use relevant methods and approaches to create a high-quality environment. Teacher self-efficacy in classroom management is also a crucial factor, as it impacts the quality of instruction. Investing in professional development opportunities for teachers can improve classroom management skills and student learning outcomes. Institutions advocating for active participation in education and utilizing students' abilities are also beneficial. Direct interaction between teachers and students, good communication skills, and respect for different perspectives make students more interested in learning activities and encourage participation. However, other factors like teaching methodology and student motivation may play a more significant role in determining academic success. Curriculum reform based on essential competencies in education should incorporate critical thinking, as students equipped with these skills are more likely to succeed in practical lessons. Therefore, focusing on these skills can positively impact student achievement.

5.2 Recommendations

1. It is recommended that teachers continue to prioritize the availability of resources and tools to support students' learning. By understanding the impact that these materials have on student success, schools can make informed decisions about how to allocate resources effectively. Additionally, ongoing assessment and feedback from students can help schools tailor their offerings to better meet the needs of their diverse student population.
2. It is also recommended that teachers prioritize teaching methods that promote critical thinking and problem-solving skills, as well as provide opportunities for students to engage in discussions and debates. By creating a supportive and inclusive learning environment, teachers can help students develop the necessary skills to excel academically and in real-world scenarios. Additionally, offering personalized feedback and encouraging self-

reflection can further enhance student motivation and success.

References

- Abaniel, A. (2021). Enhanced conceptual understanding, 21st century skills and learning attitudes through an open inquiry learning model in Physics. *Journal of Technology and Science Education*, 11(1), 30. <https://doi.org/10.3926/jotse.1004>.
- Agyei, S. K., Isshaq, Z., Frimpong, S., Adam, A. M., Bossman, A., & Asiamah, O. (2021). COVID-19 and food prices in sub-Saharan Africa. *African Development Review*, 33(S1). <https://doi.org/10.1111/1467-8268.12525>.
- Ansah, F. O., Assem, H. D., Ossei-Anto, T. A., Acheampong, A., & Owusu, M. (2024). Evaluating the Availability and Effectiveness of Safety Equipment in Chemistry Laboratories at Public Colleges of Education in Ghana. *Creative Education*, 15(10), 2224–2257. <https://doi.org/10.4236/ce.2024.1510136>.
- Ayikoru, R. (2024, March 7). *Parental involvement in education and students' academic performance in public secondary schools in Terego district Uganda*. <https://dir.muni.ac.ug/items/c5b8f7bb-1490-43ef-afad-08282d6093d3>.
- Balalle, H. (2024). Exploring student engagement in technology-based education in relation to gamification, online/distance learning, and other factors: A systematic literature review. *Social Sciences & Humanities Open*, 9, 100870. <https://doi.org/10.1016/j.ssaho.2024.100870>.
- Bidarra, J., & Rusman, E. (2016). Towards a pedagogical model for science education: bridging educational contexts through a blended learning approach. *Open Learning the Journal of Open Distance and e-Learning*, 32(1), 6–20. <https://doi.org/10.1080/02680513.2016.1265442>.
- Bizami, N. A., Tasir, Z., & Kew, S. N. (2022). Innovative pedagogical principles and technological tools capabilities for immersive blended learning: a systematic literature review. *Education and Information Technologies*, 28(2), 1373–1425. <https://doi.org/10.1007/s10639-022-11243-w>.

- Bouilheres, F., Le, L. T. V. H., McDonald, S., Nkhoma, C., & Jandug-Montera, L. (2020). Defining student learning experience through blended learning. *Education and Information Technologies*, 25(4), 3049–3069. <https://doi.org/10.1007/s10639-020-10100-y>.
- Buluma, A., Kyasanku, C., Kalule, J., Mbulankende, J. S., Sebbowa, D. K., & Kiggundu, M. M. (2022). Building Bridges into the Future: An Evaluation of Stakeholders' Perceptions on the Actualisation of the Curriculum in Uganda's Seed Secondary Schools. *East African Journal of Education Studies*, 5(4), 127–140. <https://doi.org/10.37284/eajes.5.4.1001>.
- Derakhshan, A., Kruk, M., Mehdizadeh, M., & Pawlak, M. (2021). Boredom in online classes in the Iranian EFL context: Sources and solutions. *System*, 101, 102556. <https://doi.org/10.1016/j.system.2021.102556>.
- Graham, L. J., White, S. L., Cologon, K., & Pianta, R. C. (2020). Do teachers' years of experience make a difference in the quality of teaching? *Teaching and Teacher Education*, 96, 103190. <https://doi.org/10.1016/j.tate.2020.103190>.
- İlik, Ş. Ş., & Sari, H. (2017). The Training Program for Individualized Education Programs (IEPs): Its Effect on How Inclusive Education Teachers Perceive their Competencies in Devising IEPs*. *Educational Sciences Theory & Practice*. <https://doi.org/10.12738/estp.2017.5.0424>.
- Layne, H., Tiedekunta, K. J. P., Psychology, F. O. E. A., Laitos, K., Yliopisto, J., Education, M. D. P. I., & Education, M. D. P. I. (2023). *Rural student experience of spatial inequality in higher education: a case study in Kumi, Uganda*. <https://jyx.jyu.fi/handle/123456789/87856>.
- Lazarides, R., Watt, H. M., & Richardson, P. W. (2020). Teachers' classroom management self-efficacy, perceived classroom management and teaching contexts from beginning until mid-career. *Learning and Instruction*, 69, 101346. <https://doi.org/10.1016/j.learninstruc.2020.101346>.
- Mfaume, H., & Bilinga, M. (2016). Prevalence of Teachers' Professional Malpractices in Tanzanian Public Secondary Schools: What Ought to Be Done? *Journal of Education and Training Studies*, 5(2), 43. <https://doi.org/10.11114/jets.v5i2.2106>.
- Patterson, R. H., Suleiman, O., Hapunda, R., Wilson, B., Chadha, S., & Tucci, D. (2024). Towards universal access: A review of global efforts in ear and hearing care. *Hearing Research*, 445, 108973. <https://doi.org/10.1016/j.heares.2024.108973>.
- Shaaruddin, J., & Mohamad, M. (2017). Identifying the Effectiveness of Active Learning Strategies and Benefits in Curriculum and Pedagogy Course for Undergraduate TESL Students. *Creative Education*, 08(14), 2312–2324. <https://doi.org/10.4236/ce.2017.814158>.
- Shana, Z., & Abulibdeh, E. S. (2020). *Science practical work and its impact on high students' academic achievement*. Dialnet. <https://dialnet.unirioja.es/servlet/articulo?codigo=7641618>.
- Tan, D. Y., Tay, E. G., Teo, K. M., & Shutler, P. M. E. (2020). Hands, Head and Heart (3H) framework for curriculum review: emergence and nesting phenomena. *Educational Studies in Mathematics*, 106(2), 189–210. <https://doi.org/10.1007/s10649-020-10003-2>.
- Wang, Y., Derakhshan, A., & Zhang, L. J. (2021). Researching and Practicing Positive Psychology in Second/Foreign Language Learning and Teaching: The Past, Current Status and Future Directions. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.731721>.
- Xie, F., & Derakhshan, A. (2021). A Conceptual Review of Positive Teacher Interpersonal Communication Behaviors in the Instructional Context. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.708490>.
- Yang, C., Luo, L., Vadillo, M. A., Yu, R., & Shanks, D. R. (2021). Testing (quizzing) boosts classroom learning: A systematic and meta-analytic review. *Psychological Bulletin*, 147(4), 399–435. <https://doi.org/10.1037/bul0000309>.