Students' Motivation To Learn Physics in Secondary Schools. Case of Ubungo District-Tanzania.

Stanslaus Peter Kashinje

St. Joseph University in Tanzania, College of Engineering and Technology Department of Sciences, Mathematics and Education,Dar es salaam, Tanzania

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ABSTRACT

This study investigates the factors influencing secondary school students' motivation to learn Physics in Ubungo District, Tanzania. Despite Physics being a core science subject with significant relevance to technological and industrial development, it continues to record low student enrolment and performance in national examinations. The research adopted a mixed-methods approach, combining quantitative data from structured questionnaires administered to students and teachers with qualitative insights from interviews and focus group discussions. A total of 116 respondents comprising of 97 students, 13 physics teachers, 5 heads of schools and 1 district education officer were involved in this study. Key factors explored include students' attitudes towards Physics, the availability of teaching and learning resources, teacher competence and teaching methods, parental support, and the perceived relevance of Physics to future careers. The findings reveal that a combination of internal (student-related) and external (environmental and institutional) factors substantially impact students' motivation. Among these, teacher enthusiasm, practical-oriented teaching methods, and clear career linkages emerged as critical motivators. Finally the study recommended targeted interventions such as teacher training, improved laboratory facilities, and career guidance programs to enhance student motivation in Physics. These findings provide valuable insights for policymakers, educators, and curriculum developers aiming to improve Physics education in Tanzanian secondary schools.

Keywords: Learning Physics, Ubungo-Tanzania, Mixed Research Method, Physics Learning Resources, Student's Motivation.

INTRODUCTION

Physics is a fundamental branch of science that not only underpins technological advancement but also cultivates critical thinking and problem-solving skills in students. Despite its significance, many secondary school students demonstrate a lack of motivation to learn physics, often perceiving it as abstract, difficult, and disconnected from everyday life. This growing disengagement poses a challenge to science education and the development of future professionals in science, technology, engineering, and mathematics (STEM) fields.

Recent educational philosophers and theorists have emphasized the crucial role of motivation in learning. Nussbaum (2020) highlights the importance of nurturing curiosity and emotional engagement in education, advocating for teaching approaches that connect subject matter to human experiences. Biesta (2017) argues that true education should focus not only on knowledge acquisition but also on the formation of identity and meaningful engagement with the world. Similarly, contemporary theorists like Nel Nodding's (Mondal and Gosh, 2025) stress the role of care and relational teaching in fostering motivation, particularly in subjects where students often feel disconnected.

Moreover, philosophers such as Kieran Egan and his recent interpreters (Egan, 1998) suggest that imaginative engagement can make scientific concepts more accessible and interesting to students, while Julianne Moss (Moss, 2006) emphasizes learner agency and voice in curriculum design as critical for motivation. These

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perspectives reinforce the idea that students' motivation to learn physics is deeply influenced by pedagogical practices, teacher-student relationships, curricular relevance, and the broader school environment.

This study explores these philosophical insights in the context of secondary school physics education, aiming to identify the specific factors—both internal and external—that influence students' motivation to learn physics. By integrating contemporary educational thought with empirical data, the research seeks to provide actionable recommendations for improving motivation and learning outcomes in physics classrooms.

Statement of the Problem

Despite the recognized importance of physics in fostering scientific literacy and technological development, there is growing concern in Tanzania over students' persistent low motivation and poor performance in the subject at the secondary school level. According to the Tanzania Institute of Education (TIE, 2024), physics is a core component of the science curriculum intended to equip learners with knowledge and skills relevant to national development and individual career growth, especially in science and engineering fields. However, national examination results and classroom observations indicate that many students perceive physics as difficult, abstract, and irrelevant to their daily lives, leading to disengagement and low academic achievement(Wilson, 2024).

This situation contradicts the goals outlined in the TIE curriculum, which emphasizes learner-centered approaches, relevance to real-life contexts, and the development of positive attitudes toward science. The apparent gap between curriculum intentions and student outcomes raises critical questions about the factors influencing students' motivation to learn physics. These factors may include teacher competence and methodology, availability of teaching and learning resources, student attitudes, classroom environment, and broader socio-cultural influences.

Therefore, this study seeks to investigate the underlying factors affecting secondary school students' motivation to learn physics in the Tanzanian context. Understanding these factors is essential for aligning teaching practices with curriculum goals and for enhancing student engagement and academic success in physics.

Research Objectives

The following are the objectives of this study:

(i) To identify the factors affecting student motivation in learning physics. (Intrinsic and extrinsic factors).
(ii) To explore the role of practical applications and real-life examples towards motivation of students to study Physics.
(iii) To explore the influence of school facilities and resources in increasing student's interest.
(iv) To recommend/suggest strategies for enhancing motivation and performance in physics.

Research Questions

The study was guided by the following research questions:

(i) What factors (intrinsic and extrinsic) contribute to students' motivation in learning physics among secondary school students?
(ii) How can different teaching approaches influence students' motivation in physics?
(iii) To what extent do practical applications, school facilities and resources and real-life examples improve student engagement in physics?
(iv) What are the most effective strategies to enhance students' motivation in learning physics?

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Significance of the Study

The investigation into the factors influencing secondary school students' motivation to learn physics is of great significance at multiple levels of educational, institutional, policy, and societal. The findings of this study are expected to contribute meaningfully to the understanding and improvement of physics education in Tanzania. The significance is outlined in detail as follows:

Contribution to Educational Practice

This study provides valuable insights for teachers, especially physics educators, by identifying effective strategies that can enhance student motivation. By understanding the internal and external factors that affect learners' attitudes and engagement with physics, teachers can adopt more learner-centred, inclusive, and interactive teaching methodologies. The study supports the professional development of teachers by offering evidence-based recommendations for improving classroom practices, promoting curiosity, and making physics more accessible and relevant to students' daily lives.

Curriculum Development and Implementation

The study contributes to the on-going efforts by the Tanzania Institute of Education (TIE) to refine and improve the science curriculum. By highlighting gaps between curriculum intentions and actual classroom experiences, the study provides data that can be used to align curriculum design with student needs, learning styles, and motivational drivers. Recommendations from this research can assist curriculum developers in incorporating real-life applications, contextualized content, and more inclusive pedagogical approaches to better engage students in physics.

Policy Development and Educational Planning

Findings from the study will offer policymakers and educational planners' empirical evidence on the current state of student motivation in physics education. This is critical for designing and implementing national strategies aimed at improving science education outcomes, particularly in alignment with Tanzania's Vision 2025 and Sustainable Development Goal 4 (Surattana and Rattanawadee, 2022). The study may inform policy decisions related to teacher training, resource allocation, gender equity in STEM, and performance monitoring systems.

Improvement of Student Performance and Career Readiness

Motivation is a key determinant of academic success. By identifying and addressing the barriers to motivation in physics, this study contributes to efforts to raise student performance in national examinations. Furthermore, increased motivation may lead to greater enrolment and retention in physics-related courses, ultimately producing more graduates ready to pursue careers in engineering, medicine, information technology, and other science-driven fields crucial to Tanzania's economic development.

Support for Gender Equity in Science Education

The study sheds light on gender-based motivational challenges, which is particularly important in a context where girls are underrepresented in physics and other STEM subjects. By identifying factors that influence motivation differently across genders, the research supports the development of targeted interventions that encourage female students to engage with physics, thereby promoting inclusivity and equity in science education.

Enrichment of Academic Literature and Research

This study contributes to the body of academic knowledge on motivation and science education in sub-Saharan Africa, and specifically in Tanzania. There is a limited amount of local research that focuses on the motivational aspects of learning physics at the secondary level. This study fills that gap and provides a

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foundation for future research by scholars, educators, and institutions seeking to deepen their understanding of educational psychology and student engagement in STEM fields.

Informing Parental and Community Engagement

Parents and communities play a significant role in shaping students' attitudes and aspirations. The study emphasizes the influence of socio-cultural factors and family support on students' motivation. By disseminating findings to broader audiences, including parents and local communities, the study encourages greater support for students, especially in promoting positive attitudes toward physics and reinforcing the value of science education at home.

In summary, the study is significant because it addresses a pressing educational issue from a multidimensional perspective. It offers practical, policy-oriented, and scholarly contributions that can help transform the teaching and learning of physics in Tanzanian secondary schools, ultimately contributing to national development goals and global education standards.

Limitations of the Study

While this study aims to provide comprehensive insights into the factors influencing secondary school students' motivation to learn physics, certain limitations were encounterd in its execution. These limitations affect the scope, depth, and generalizability of the findings. They are outlined as follows:

Limited Geographical Coverage

Due to financial, logistical, and time constraints, the study involved only a selected number of secondary schools within Ubungo district. As a result, the findings may not fully represent the diversity of school settings across Tanzania, especially considering differences between urban and rural schools, public and private institutions, and well-resourced versus under-resourced environments.

Reliance on Self-Reported Data

The study primarily uses questionnaires and interviews to collect data from students and teachers. These instruments depend on the honesty and self-awareness of respondents. There is a risk of social desirability bias, where participants may provide responses that they believe are expected or acceptable rather than their true feelings or experiences. This can affect the reliability of the data collected on sensitive issues such as student attitudes, teacher effectiveness, and school conditions.

Time Constraints

The academic calendar and examination schedules may limit the time available for data collection in schools. Teachers and students might be preoccupied with syllabus coverage and exam preparation, leading to reduced participation or rushed responses during surveys and interviews. This can affect the depth and accuracy of the data gathered.

Language and Interpretation Challenges

While the study instruments was designed in English or Kiswahili, differences in students' language proficiency and comprehension levels might have affected their ability to fully understand and respond to questions—particularly abstract or theoretical items related to motivation, perception, and teaching methods. Misinterpretation of questions could have led to inaccurate responses.

Access to Schools and Participants

Gaining official permission from education authorities, school administrators, and parents to conduct research in schools involved bureaucratic delays. In some cases, some schools were unwilling or unable to participate,

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especially if they perceived the study as disruptive or if they lacked time and personnel to coordinate the activities. This limited the sample size and diversity.

Resource Constraints

Executing a research project of this nature requires financial resources for transportation, printing of research tools, data analysis software, and possibly incentives for participants. Limited funding restricted the number of schools covered, the extent of follow-up visits, and the ability to triangulate findings through multiple data sources.

Mitigation Strategies:

While these limitations are acknowledged, efforts were made to minimize their impact. This includes careful sampling to ensure diversity within the selected schools, piloting instruments to ensure clarity and appropriateness, building rapport with school stakeholders, and applying triangulation methods to enhance the credibility and reliability of the data.

LITERATURE REVIEW

The motivation of students to learn physics has been the subject of extensive research worldwide due to its critical role in science education and the development of STEM-related competencies. In the Tanzanian context, this issue has become increasingly relevant as educational stakeholders seek to improve student performance and engagement in science subjects, particularly physics. This literature review explores key themes and findings from both global and local studies, with an emphasis on theoretical perspectives, empirical evidence, and curriculum frameworks such as those developed by the Tanzania Institute of Education (TIE, 2024).

Theoretical Frameworks of Motivation in Education

Motivation in learning is commonly explained through several theoretical lenses. The Self-Determination Theory (SDT) developed by Deci and Ryan (1985) distinguishes between intrinsic and extrinsic motivation, emphasizing the importance of autonomy, competence, and relatedness in fostering deep engagement. In physics education, intrinsic motivation is often tied to curiosity, interest in the subject, and perceived relevance, while extrinsic motivation may relate to grades, future career goals, or teacher approval.

Expectancy-Value Theory (Eccles & Wigfield, 2002) also offers valuable insights, suggesting that students' motivation is influenced by their expectations of success and the value they attach to the subject. This model has been applied in various contexts to understand why students may or may not be motivated to engage with physics. Research shows that when students believe physics is valuable for their future and that they can succeed in it, they are more likely to be motivated and perform better (Navarro, 2026).

In recent years, educational philosophers such as Biesta (2017) and Nussbaum (2020) have contributed to this discourse by emphasizing the moral and emotional dimensions of learning. Biesta, for instance, argues that education should focus not only on knowledge and skills but also on subjectification—the formation of identity and meaning. Nussbaum underlines the importance of emotional engagement and connection to human experiences, which are often missing in the way physics is taught.

Factors Influencing Students' Motivation to Learn Physics

Numerous studies identify a range of factors—both internal and external—that influence students' motivation in physics:

Teacher Quality and Pedagogical Approaches

Recent studies underscore the pivotal role of teacher motivation and instructional methods in influencing

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student engagement and performance in physics. Mwakyangwe (2017) found a significant correlation between teacher motivation and student performance in secondary schools, highlighting that motivated teachers are more likely to employ effective teaching strategies that enhance student learning outcomes. Similarly, Mbope (2015) emphasized that teacher motivation directly impacts the quality of teaching and learning, suggesting that factors such as recognition, professional development opportunities, and supportive leadership contribute to higher teacher motivation levels.

In the context of curriculum implementation, Ngussa (2015) discussed the importance of teacher motivation in effectively delivering the curriculum, noting that motivated teachers are more likely to engage in innovative teaching practices that foster student interest and motivation in subjects like physics.

Curriculum Design and Relevance

The alignment of curriculum content with students' real-life experiences and future aspirations is crucial for enhancing motivation in Physics. Mkimbili (2022) highlighted that the Tanzanian physics syllabus emphasizes learner-centred and competence-based approaches, aiming to develop students' ability to apply physics concepts in daily life. However, the study also noted challenges in implementing inquiry-based teaching methods due to contextual factors, which can hinder the effectiveness of the curriculum in motivating students.

Furthermore, Ngussa (2015) argued that teacher motivation plays a significant role in curriculum implementation, suggesting that when teachers are motivated, they are more likely to deliver the curriculum effectively, thereby enhancing student motivation and engagement.

Availability of Resources

The presence of adequate teaching and learning resources is essential for effective physics education. Shumbi and Mrema (2021) conducted a study in Singida Municipality, revealing that many public secondary schools lacked essential educational resources such as computers, projectors, and bulletin boards, which are vital for interactive and engaging physics instruction. The study concluded that the unavailability and underutilization of educational resources negatively impact the quality of education and student motivation.

Similarly, a study in Karatu District (Sijaona and Kitula, 2022) found that public secondary schools faced shortages of qualified science teachers and lacked modern instructional facilities, including computers and projectors, which are crucial for effective physics teaching. The study recommended that educational administrators ensure the provision of adequate resources to improve teaching and learning outcomes.

Student Attitudes and Self-Efficacy

Students' beliefs about their own ability to learn physics—known as self-efficacy—greatly influence their motivation. Bandura's theory of self-efficacy (1997) posits that students who believe they are capable of learning a subject are more likely to persist through difficulties and perform better. In contrast, many students in Tanzania develop negative attitudes toward Physics early on, often reinforced by poor teaching practices or discouraging experiences in lower secondary school levels.

Peer influence also plays a role, with students often shaping their attitudes based on what is commonly believed about physics within their social groups. If Physics is widely seen as a "difficult" or "boys'" subject, girls and less confident students may be less likely to engage fully.

Gender and Socio-Cultural Factors

Gender disparities in physics motivation and performance have been documented in Tanzania and globally. Studies such as those by Mlama et al. (2005) and Mgaiwa (2019) show that girls are underrepresented in science subjects, largely due to socio-cultural beliefs, lack of encouragement, and limited role models. Gender-sensitive teaching practices and inclusive classroom environments have been recommended to address these issues and improve girls' motivation.

Cultural attitudes toward science, career aspirations, and family expectations also affect how students perceive the value of physics. Students who come from families or communities that value education and science are more likely to be motivated, as noted by Ngussa & Mbuti (2017).

Policy and Institutional Support

The Ministry of Education, Science and Technology in Tanzania, along with TIE, has initiated various programs aimed at improving science education, including in-service teacher training and the distribution of laboratory kits (URT, 2018). However, the effectiveness of these initiatives is often limited by inadequate follow-up, poor implementation, and a lack of monitoring mechanisms. According to UNESCO (2021), sustained policy support, adequate funding, and professional development for teachers are essential for meaningful improvements in student motivation and learning outcomes.

Summary of Literature Gaps

While existing literature provides valuable insights into the factors influencing students' motivation to learn physics, several gaps remain. First, there is limited localized research that explores the interplay of these factors specifically within Tanzanian secondary schools. Second, the perspectives of students themselves—particularly regarding how they experience physics education—are underrepresented. Finally, the application of recent philosophical insights on motivation and identity formation in Tanzanian science classrooms has not been adequately explored.

This study seeks to fill these gaps by examining both the systemic and experiential dimensions of motivation in physics education, using a mixed-methods approach grounded in contemporary theory and local realities.

RESEARCH DESIGN AND METHODOLOGY

This study employed a mixed research approach whereby both quantitative and qualitative methods are used to collect and analyse data. In the current study, these approaches helped to obtain more details and specific information about the problem of the study. It also gave freedom to use narration and numbers during data analysis to comprehensively investigate the factors influencing secondary school students' motivation to learn physics in Ubungo District, Tanzania.

Research Design

Among the types of research design is convergent parallel, which meant the researchers simultaneously collect the quantitative and qualitative data in the same phase of the research process, weigh the methods equally, analyse the two components independently and interpret the results together (Creswell, 2018). The researchers collected data from students and teachers by using a questionnaire, and then analysed the data collected by using qualitative and quantitative methods of analysis. The researchers went to the specific schools to administer questionnaires to teachers, and students then met with the heads of schools for the interviews.

Research Methodology

Target Population

The target population for this study involved Physics students from five (5) schools (3004), physics teachers from five (5) secondary schools who made a total of 15, heads of schools from (5) secondary schools and (1) District Education Officer in Ubungo District, totalling to 3025.

Area of the study

The study was conducted in Ubungo district. Ubungo municipal council is one of the five (5) municipalities that constitute the city of Dar-Es- Salaam which is the major business city of Tanzania. Ubungo is bordered by

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Kibaha district to the south, Kinondoni district to the North-East and Kisarawe district to the East (see Figure 3.1).

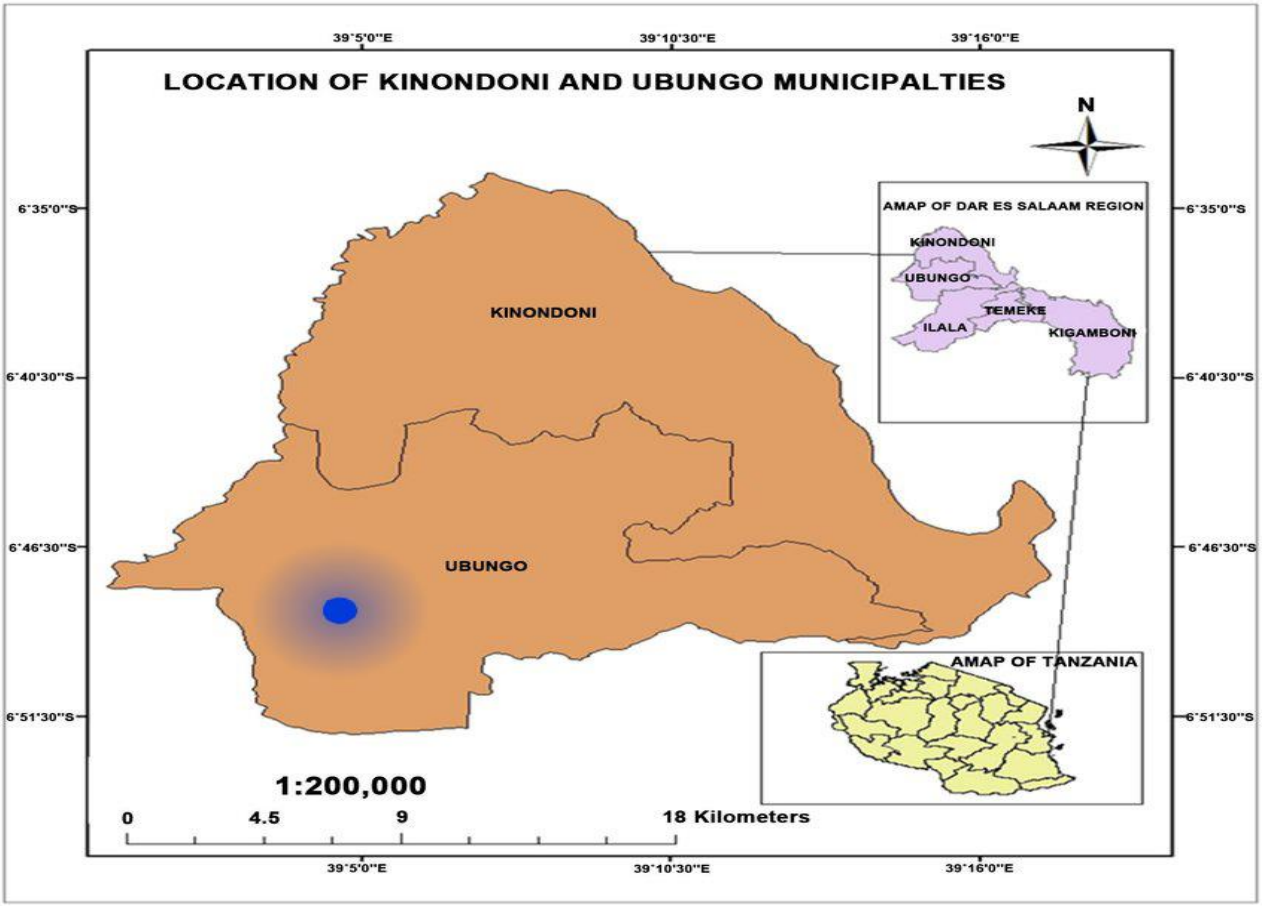


Figure 3.1Map of Ubungo district in Tanzania

The municipality is well linked by roads and other communication networks to the rest of the city and other parts of the country. Major road links are Morogoro-road, Mandela –road and Sam Nujoma –road. The municipality has a total area of 260.40 square kilometres and population about 1,086,912 according population census (Ministry of Education, Tanzania, 2023). It comprises of 74 secondary schools of which 38 are government owned schools and 36 are private owned schools.

In the current study, the researchers employed both probability and non-probability sampling techniques to select participants from five secondary schools. In probability sampling, simple random sampling technique was used to select teachers and students, Singh & Masuku (2014). Non-probability sampling technique was used to select participants who had full information about school infrastructure and teaching personnel. In the current study the researchers employed purposive sampling technique for the District Education Officer and Heads of schools.

The researchers used Yamane formula (1967) to compute the sample size.

$$n = \frac{N}{1+N(e)^2} \quad (1)$$

Whereby

n = sample size,

N = total population and

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e = level of precision.

The level of precision is 0.1, 0.05 or 0.07 depending on the size of the population. In our case e = 0.1

Thus, the total population of students was 3004, then, $n = \frac{3004}{1+3004(0.1)^2} = 97$. Therefore, 97 students were selected from 5 secondary schools. Likewise, 15 Physics teachers constitute from the population thus, to get the sample size of teachers $n = \frac{15}{1+15(0.1)^2} = 13$. Therefore, 13 teachers were selected from 5 secondary schools. Also, the researchers purposively selected 5 heads of schools and 1 District Education Officer from Ubungo District. To obtain a sample size of students and teachers of each school the researchers used the proportional sample size to find the number of students and teachers who would be given the questionnaire. The researchers used a formula that is due to Singh & Masuku (2014) which stated that;

$$n_i = \frac{N_i}{N} \times n \qquad (2)$$

Where;

n_i = Proportional sample size from each school,

N_i = Total number from each school,

N = Total population of students from the 5 secondary schools,

n = Main sample size obtained from Yamane formula.

Therefore, by starting with students, the total number for each school was "S1" = 978, "S2" = 252, "S3" = 566, "S4" = 622 and "S5" = 586, totalling to 3004 for five secondary schools. While main sample size obtained from Yamane formula was 97. To get the number of students involved in answering the questionnaire for each school the researchers used equation (2), and the results are summarized in table 3.1

Table 3.1 Numbers of Students Involved in Answering the Questionnaire.

SCHOOL	Ni	N	n_i	n
S1	978	3004	32	97
S2	252	3004	8	97
S3	566	3004	18	97
S4	622	3004	20	97
S5	586	3004	19	97

Therefore, from school S1 were 32, S2 = 8, S3 = 18, S4 = 20 and S5 = 19 of the respondents used in data collection. In total there were 97 students. While the main sample size of teachers obtained from Yamane formula was 13. To get the number of teachers involved in answering the questionnaire for each school the researcher used equation (2) again.

Table 3.2. Number of teachers involved in the interview

SCHOOL	**Ni**	**N**	**ni**	**n**
S1	3	15	3	13
S2	2	15	1	13
S3	3	15	2	13

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SCHOOL	Ni	N	ni	n
S4	4	15	4	13
S5	3	15	3	13

Therefore, using equation (2), from school S1 was 3, S2 = 1, S3 = 2, S4 = 4 and S5 = 3 of the respondents were used to collect data. The total number of the sample size was therefore 13 teachers (see table 3.2).

Sampling of Secondary Schools in Ubungo District: There are 38 government owned secondary schools. The researchers selected five schools from Ubungo District by using a non-probability sampling procedure (purposive) to select secondary schools. The researchers used this method because these schools had poor performance in physics for consecutive three years, and therefore, the researchers observed the lack of motivation for students to learn physics in these secondary schools. Stratified sampling technique to students was based on gender (female and male) and class level.

In the current study, the researchers used the simple random sampling to sets of blank and numbered pieces of paper; those who picked the papers with numbers are the ones that were taken as respondents.

Five heads of schools were selected from public secondary schools out of 38 secondary schools by using purposive sampling.

The researchers also used purposive sampling to select the District Education Officer from the Ubungo district in the study in order to get more detailed information about the topic under study.

Table 3.3 Summary of Sample Size

No	Category	Target Population	Respondent	Sampling technique
1	Students	3004	97	Simple random and stratified sampling
2	Teachers	15	13	Simple random and stratified sampling
3	Head of schools	5	5	Purposive sampling
4	DEO	1	1	Purposive sampling
Total		3025	116	

Source: Researchers 2025

Table.3.3 describes the composition of the sample size, whereby participants who were involved in the study were 116. The respondents who were involved in the interview were 6, while 110 participants were involved in answering the questionnaire: 13 teachers and 97 students. The current study employed questionnaires, interviews, and observation in data collection. In the current study, both close-ended and open-ended questions were employed. The researchers selected 13 Physics teachers and 97 students that helped to get detailed data from dissimilar sources, in addition they, had a wider chance of giving detailed explanations. The researchers used open-ended interviews for the heads of schools and the District Education Officer through face to face and note-taking. The techniques were flexible as they allowed the researchers to restructure any question accordingly in order to obtain appropriate information. Opdenakker (2006) stated that the advantage of a structured interview is that the interviewer has a lot of possibilities to create a good interview environment. The researchers encouraged freedom, openness among the interviewee assuring them of confidentiality of information that was provided. The use of interviews too, helped the researcher to get more information, and provide in-depth data. The researchers conducted a pilot study to test the instruments of data collection in one public secondary school in Ubungo District to validate the questionnaire and to ensure the reliability of the questionnaire, Hassan, etal. (2006). The students involved in the pilot study were not engaged in the final questionnaire. In this study, the researchers used different ways to ensure the validity of the research instruments. Likewise, the researchers ensured that the face and content validity was maintained through triangulation and maintaining trustworthiness. The face validity was tested through careful preparation of tools by observing its clarity, appearance, consistency of arrangement as well as grammatical aspects of language

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(Mugenda 2003). Triangulation ensured the validity of the process through collaborating evidence from different individuals, types of data, and different methods of data collection (Fusch & Ness 2018). The researchers used different methods to make sure the instruments were valid. Moreover, before starting the data collection process, the researchers passed the instruments to the researcher experts and academic peer groups for purposes of testing and proofreading the instruments for validity.

The researchers proceeded because the instruments were found to be clear. In the current study, the researchers used Statistical Package for Social Sciences (SPSS) to examine the strength of the instrument whereby, the piloted questionnaire was recorded by number and then, coded into the SPSS program in the scale for processing and interpretation. The result correlated positively at 0.7 or 70 percent. Therefore, the result was strong and reliable because the coefficient of the instrument was high.

DATA PRESENTATION, ANALYSIS AND DISCUSSION

A total number of 110 questionnaires were administered to the teachers and students whereby 13 questionnaires were administered to Physics teachers and 97 questionnaires were administered to students from five secondary schools selected in Ubungo District. All the 110 questionnaires were completed. Also, a total of 6 interviews were conducted to the heads of schools and District Education Officer whereby 5 heads of schools were interviewed and one District education officer (DEO) from Ubungo District was also interviewed. Finally, the researchers made observations on the five secondary schools in Ubungo district. This helped the researchers to make correlations from one research tool to another.

Teachers Demographic Information

Table 4.1Teacher's demographic information (n = 13)

ITEM	CATEGORY	FREQUENCY	PERCENTAGE (%)
Gender	Male	11	84.6
	Female	2	15.4
Age	24-33 Years	9	69.2
	34-43 Years	3	23.1
	44-53 Years	1	7.7
	54 and above	0	0
Education level	Diploma	3	23.1
	Bachelor	10	76.9
	Masters	0	0
Working experience	5 Years and below	12	92.3
	6-11Years	1	7.7
	12 Years and more	0	0
	Total	13	100

Source: Field data 2025

Table 4.1 above indicates the distribution of teachers based on their gender as 84.6 percent of 13 of the respondents were male teachers while 15.4 percent of the respondents were female teachers. The study included the gender of the participants to avoid acquiring biased information. Table 4.1 also shows that the age difference of teachers being 69.2 percent of teachers aged 24-33; 23.1 percent aged 34-43 and 7.7 percent aged 44-53. This signifies that the majority of teachers were young adults. Therefore, the findings revealed that teachers were aware about the factors influencing motivation for students to learn physics in secondary schools.

Table 4.1 also shows that 23.1 percent of the respondents had a diploma in education, 76.9 percent of the respondents had a Bachelor's degree, and none of the respondents had a master's degree in education. This reveals that the majority of teachers had a Bachelor's degree and few headmasters were degree holders. Table

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4.1, in addition highlights the teaching experiences of the respondents whereby 92.3 percent of the teachers had taught for a period of 5 years; 7.7 percent of the teachers had taught for 6-11 years while none of teachers had taught for 12-20 years. Also, the majority of teachers indeed gave out desirable information as they had much experience with factors influencing secondary school students in learning physics.

Students' Demographic Information

The student demographic information aimed at establishing the participants' gender, age and level of education as presented in table 4.2.

Table 4.2 Distribution of Students Demographic Information (n = 97)

ITEMS	CATEGORY	FREQUENCY	PERCENTAGE
Gender	Male	46	47.4
	Female	51	52,6
Age	13-16 Years	24	24.7
	17-20 Years	70	72.2
	21 and above	3	3.1
Class level	O – level	97	100
	A – level	0	0
Total		97	100

Table 4.2 shows the distribution of students' respondents based on gender, whereby; 47.2 percent were male students and 52.8 percent were female students. This shows the almost equal chance for both male and female students in accessing education. Hence, in the area where the study was conducted the number of females in schools is higher than the number of males. Table 4.2 also shows that 24.7 percent of the students were aged between 13-16 years, while 72.2 percent of students were aged between 17-20 years.

However, 3.1 percent of the 97 students were aged 21 years and above. This implies that students were within the secondary education active age and they were aware of the importance of school infrastructures as well as the need to achieve better academic performance. The data in table 4.2 also show that 100 percent of students were at an ordinary secondary school level, whereas none of them were at an advanced secondary school level.

Factors Influencing secondary school students' motivation to learn physics

Intrinsic and extrinsic factors.

This study focused on investigating the factors influencing secondary school students to learn physics. The results are as shown below;

Table 4.3 The results of the research

Question	SA	A	N	D	SD	Total
Q5: I enjoy physics w/o rewards	25	40	15	10	7	97
Q6: I study physics to get grades	30	35	20	8	4	97
Q7: I feel proud when I understand	22	38	18	12	7	97
Q8: I want to be a scientist	18	32	20	17	10	97
Q9: Encouraged by parents/teachers	40	30	15	7	5	97

Key: SA – Strongly Agreed, A – Agreed, N – Neutral, D –Disagreed,

SD – Strongly Disagreed

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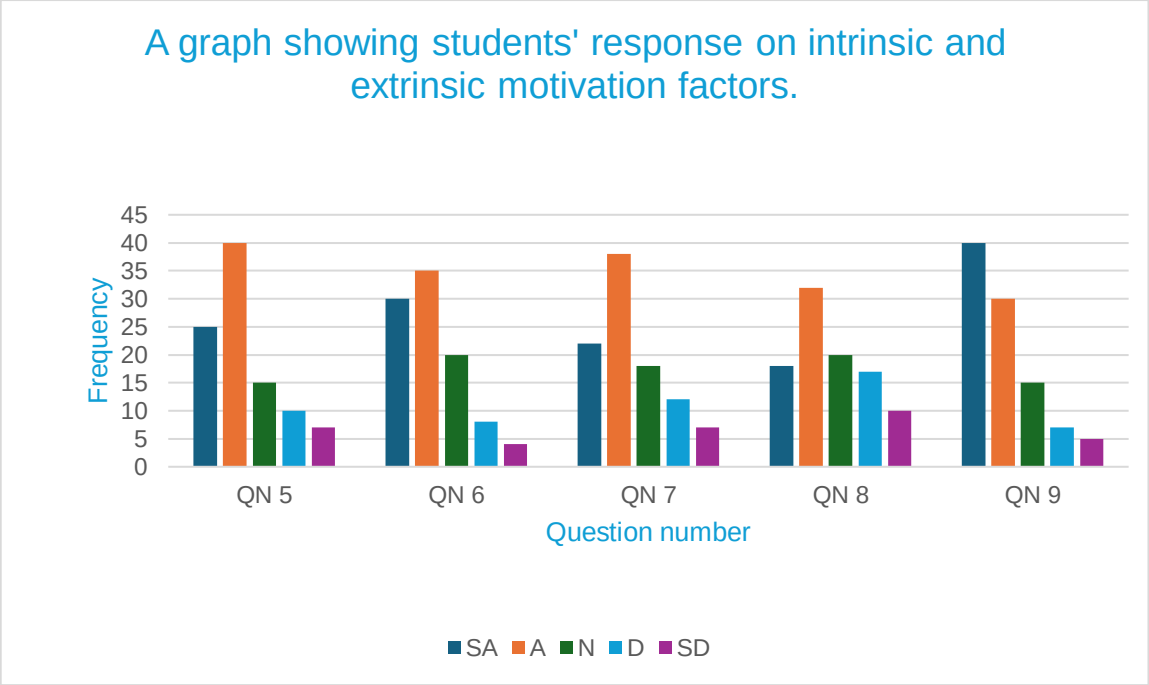


Figure 4.1 Graph of students' response

The analysis of student responses to five motivation-related questions reveals the presence of both intrinsic and extrinsic motivation among learners.

67% of students (Q5) either agreed or strongly agreed that they enjoy learning physics even without rewards, indicating strong intrinsic motivation.

In Q6, 67% also reported studying physics to achieve good grades, reflecting extrinsic motivation.

These results are in agreement with Fowler, 2025 and Zhang et al., 2025 who found that Career ambitions and grade goals serve as strong motivators for short term engagement. However, they found that curiosity and deep interest in physical phenomena is essential for long term retention.

Responses to Q7 show that 62% of students feel proud when they understand physics concepts, further emphasizing internal satisfaction.

However, in Q8, only 51.5% expressed career-oriented interest in becoming a scientist, while 27.8% disagreed (D) or strongly disagreed (SD), suggesting career aspiration in physics is moderate.

Encouragingly, Q9 shows that 72% of respondents receive motivation from parents or teachers, a positive external support factor. These findings are also in agreement with the results of Fowler (2025).

Overall, these findings suggest that student motivation is influenced by a blend of internal enjoyment, career goals, pride in mastery, and external reinforcement from educators and family.

The role of practical applications and real-life examples.

Table 4.4 The role of practical applications and real-life examples.

Question	SA	A	N	D	SD	Total
Q10: Experiments Help	35	40	10	7	5	97
Q11: Teacher Uses Real-life Examples	20	35	18	15	9	97
Q12: Physics Related to Daily Life	25	37	15	12	8	97

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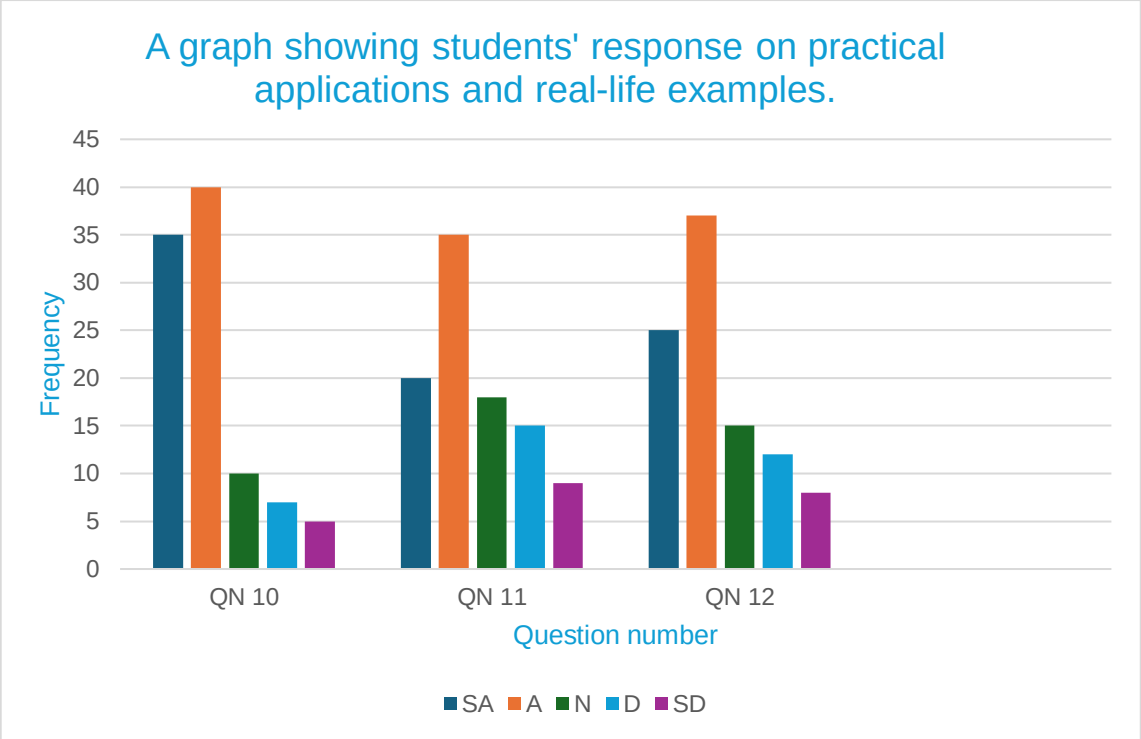


Figure 4.2 A graph showing students' response on practical applications and real-life examples

The analysis shows that over 77% of students (Q10) agreed or strongly agreed that doing experiments helps them understand physics better. This suggests that practical work is a powerful motivator that improves students' interest and engagement in the subject.

Regarding the use of real-life examples (Q11), about 56.7% of students agreed or strongly agreed that their teachers use such examples. However, a noticeable 24.7% disagreed or strongly disagreed, indicating that not all classrooms integrate relatable content effectively.

Question 12 reveals that 63.9% of students find it easy to relate physics to daily life situations, which enhances relevance and interest in the subject. These findings confirm that real-life application and practical experiences play a crucial role in stimulating curiosity and motivation among students.

School facilities and resources in increasing student's interest.

The analysis of responses related to resources and facilities shows a mixed picture.

Table 4.5 The analysis of responses related to resources and facilities shows a mixed picture

Question	SA	A	N	D	SD	Total
Q13: Equipped	20	28	17	18	14	97
Q14: Enough material	18	35	15	17	12	97
Q15: lack of resources reduce interest	30	38	12	10	7	97
Q16: Teacher support	33	34	15	10	5	97
Q18: Need more practical	40	36	8	8	5	97

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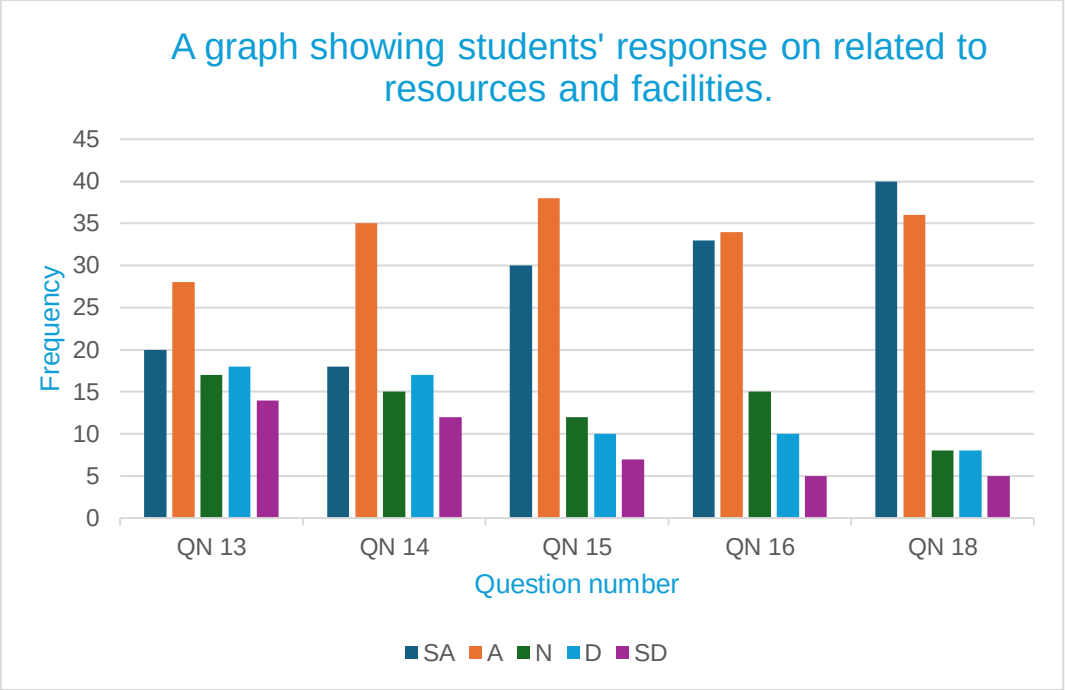


Figure 4.3 A graph showing students' response on related to resources and facilities

For Q13, only 49.5% of students agreed or strongly agreed that their school has a well-equipped physics lab, while a notable 33% disagreed or strongly disagreed. This indicates that many schools lack adequate laboratory facilities.

Q14 shows a relatively better situation: 54.7% of students felt their schools had enough textbooks and materials. However, 29.9% disagreed, showing that teaching resources are not evenly distributed.

In Q15, 70.1% of students agreed or strongly agreed that a lack of resources reduces their interest in physics, clearly confirming that insufficient facilities negatively affect motivation. This agrees well with Winkelmann et al., (2025) who found that experimental work (both teacher-led and student-led investigations, dramatically improves situational interest, task engagement and attitude toward science.

Encouragingly, Q16 shows that 69.1% of students feel supported by their physics teachers, which is a positive internal school factor.

Q18 highlights a high demand for more practical sessions: 78.4% agreed or strongly agreed that they need more practical in physics. These results are summarised in Figure 4.3

Overall, the findings demonstrate that availability of resources and teacher support are key factors in student motivation, but there is a major gap in laboratory and practical provisions which needs urgent attention.

Suggested Strategies to Enhance Student Motivation in Physics (Objective 4)

This section aimed to explore strategies that can be used to improve student motivation in learning physics. Both quantitative data (from students) and qualitative data (from teachers, heads of schools, and the district education officer) were analysed.

Extra lessons and Seminars.

Student Response to Extra Lessons as a Motivation Strategy (Q17).

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Table 4.6 Student Response to Extra Lessons as a Motivation Strategy (Q17).

Response	Frequency	Percentage (%)
Strongly Agree	38	39.2%
Agree	36	37.1%
Neutral	12	12.4%
Disagree	7	7.2%
Strongly Disagree	4	4.1%
Total	97	100%

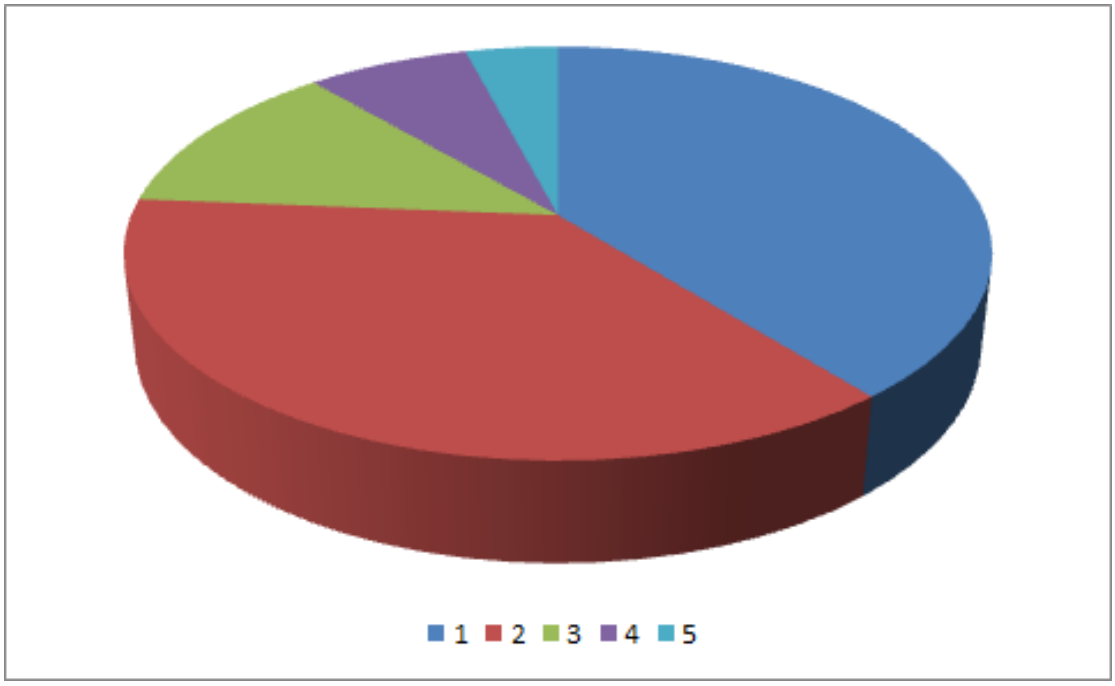


Figure 4.4 A pie chart showing students responses on extra lessons and seminars

1- SA, 2- A, 3- N, 4- D, 5- SD

The findings from Q17 show that extra lessons are a highly recommended strategy, with over three-quarters (76.3%) of students stating that they feel more motivated to learn physics when given additional sessions beyond regular class time.

Neutral or negative responses account for only 23.7%, showing a generally strong support for this strategy. These results are summarised in Figure 4.4

Furthermore, interview responses from teachers, head of schools and the education officer revealed additional strategies:

- Provision of lab equipment to allow more hands-on practical.
- Policy reform to emphasize physics equally with other science subjects.
- Training for teachers on how to integrate real-life examples into lessons.
- Parental involvement and career guidance to inspire students.

Collectively, these suggestions point toward a multi-level approach to enhancing student motivation, involving teaching methods, resource improvement, and system-level reforms.

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CONCLUSIONS AND RECOMMENDATIONS

Major Findings

Motivational Factors

Intrinsic factors like the desire to become scientists, and extrinsic influences such as encouragement from teachers/parents were significant. Over 72% cited external support as key.

Practical and Real-Life Relevance

About 77% agreed that doing experiments helps understanding, while over 63% found physics relevant to their daily life.

Facilities and Resources

Lack of practical resources was found to negatively affect motivation. However, teacher support was highlighted as a positive motivator.

Suggested Strategies:

Extra lessons (endorsed by 76% of students), rewards, improved resource allocation, and community involvement were recommended by both students and education personnel.

CONCLUSION

The study concludes that student motivation in physics is influenced by a combination of personal ambition, supportive learning environments, relevant teaching methods, and adequate resources. While intrinsic interest exists, motivation is greatly enhanced by external encouragement, access to practical experiences, and teacher engagement. Efforts to improve physics learning must be holistic, targeting multiple aspects simultaneously.

RECOMMENDATIONS

Based on the findings, the following recommendations are made:

For Schools

- Organize remedial and extra sessions for physics
- Provide motivational rewards for outstanding students
- Encourage teachers to use real-life examples and practical activities

For Teachers

- Apply learner-centred methods
- Offer continuous feedback and encouragement
- Use available materials creatively to make learning interactive.

For Government and District Education Office

- Deploy qualified physics teachers in all schools, especially remote ones
- Supply starter lab kits to all public schools
- Promote community and parental involvement in science education
- Monitor and support implementation of district science improvement programs

For Future Researchers

- Conduct similar studies across more districts or nationally
- Include parents and policymakers as participants
- Explore effects of gender, urban vs rural settings, or school leadership styles on student motivation

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