



Exploring Tanzanian Secondary School Teachers Experiences for Implementing the Current Practical Examination Instructions

Honestalibali Opanga David
St John's university of Tanzania, Dodoma
Email: libalih@gmail.com

Abstract: Science subjects' assessment requires practical work assessment. During practical examinations, the National Examination Council of Tanzania (NECTA) provides science teachers with advance instructions on how to prepare and arrange the laboratory for practical work. Recently, NECTA has reduced the time for science practical exams preparation for Form 4 national examinations from 24 to 3 hours, which prompts the current study's purpose. The aim of this study was to explore the experiences of these changes on science teachers' ability to effectively prepare and arrange practicals under such context. The study involved 40 science subject teachers and 10 heads of schools from 10 secondary schools in Dodoma City, Tanzania. Using a mixed-methods approach, data were collected through questionnaires, and interviews with teachers. Quantitative data were analysed using descriptive statistics, and qualitative data from the interviews were transcribed and analysed thematically. The study findings reveal that currently, exam secrecy is highly maintained, with enhanced supervision by the chief examiner during the preparation period. However, the major challenges to science teachers in the preparation of the science practical examination include the new timeframe being insufficient, the insufficient funds associated with materials for the practical, and teachers lack room to provide feedback on the time allocated. The study recommends the increased time for preparation, that is, teachers' feelings of competence in the teaching and supervision, and sufficient funds for practical examination material preparations.

Keywords: Advance instructions, Practical examinations, Secondary education, NECTA, Tanzania

How to cite this work (APA):

Libali, H. & Opanga, D. (2024). Exploring Tanzanian Secondary School Teachers Experiences for Implementing the Current Practical Examination Instructions. *Journal of Research Innovation and Implications in Education*, 8(3), 514 – 523. <https://doi.org/10.59765/zharu37592>.

1. Introduction

The place of practical examination in science education has long been a subject of heated discussion and analysis. Science practical examinations are essential for assessing students' understanding of scientific concepts and their ability to apply their knowledge to real-world situations. Science practical examinations refer to the assessments that evaluate a student's practical skills and experimental knowledge in scientific subjects (NRC, 2000). Therefore,

practical examinations play a big role in developing students' understanding of scientific theoretical concepts and developing their critical thinking and problem-solving skills. In Tanzania, Practical Examinations are among the examinations administered by the National Examination Council of Tanzania for the Certificate of Secondary Education Examination (CSEE). The National Examinations Council of Tanzania (NECTA) makes revisions to the examination formats. The revised formats have been prepared to cover all subjects for the Certificate

of Secondary Education Examination (CSEE). It includes all the core and optional subjects assessed by NECTA.

The formats for CSEE have been revised to accommodate important changes in learning. These changes include the revision of syllabuses. The changes are also linked to the new educational policy of 2014, which, among other things, directs the country to achieve a middle-level economy and industrial development by 2025. (TETP, 2014). Moreover, the examination format covers the reviewed modes of administering practical examinations, in which One Month Advance Instructions have been replaced by a checklist of the required materials for conducting such examinations (NECTA, 2019).

A valid example is observed for different O-level Biology formats that show changes in administering Biology practical examinations. The revised format of Biology subject for 2019 provides the following instructions in administering practical examinations: 'A checklist of biology laboratory specimens, chemicals, apparatuses, equipment, and materials required for the examination will be sent to schools not less than three months before the date of sitting for this paper. However, the 24-hour advance instructions will be sent in advance to be opened 24 hours prior to the beginning of the examination for making necessary laboratory arrangements. (NECTA, 2019).

The revised format of Biology provides the following instructions for administering practical examinations in 2022: A checklist for biology laboratory specimens, chemicals, apparatuses, equipment, and materials required for the examination will be sent to schools at least three months before the examination date for this paper. However, the instructions for the laboratory arrangements will be provided 3 hours before the beginning of the examination. (NECTA, 2022). These changes are provided in all science subject formats for Biology, Chemistry, and Physics for CSEE levels. Apparently, it is difficult to ascertain whether changes in time for preparation and implementation of practical examination instructions in Tanzania for practical examinations have challenges or not; this is because there are limited studies on these changes of the NECTA examination available.

2. Literature Review

Studies in science education have different views concerning practical examinations. Practical examinations are increasingly supported as a way to assess scientific understanding and skills beyond written tests. However, implementing practical exams effectively depends on teachers' experiences and knowledge towards them.

However, science teachers face numerous challenges when preparing and organising these practical examinations.

2.1 Importance of Practical Science in Secondary Education

Studies in science education have different views concerning practical examinations. Practical experiments in science subjects like Biology, Chemistry, and Physics help students understand complex theoretical concepts and develop critical thinking and problem-solving skills. Science practicals help students develop critical thinking, problem-solving skills, and scientific inquiry, all of which are essential for understanding and mastering subjects such as Biology, Chemistry, and Physics (Woolnough, 1994). Practical science plays a crucial role in secondary education, as it allows students to move beyond theoretical knowledge and engage directly with the scientific process. Subjects such as Biology, Chemistry, and Physics often involve complex concepts that can be difficult to fully grasp through textbooks alone. Practical experiments provide students with the opportunity to apply theoretical knowledge in real-world scenarios. For instance, students can observe biological processes, chemical reactions, or physical principles in action, which fosters a stronger grasp of the subject matter. Furthermore, practical lessons can help students develop important soft skills, such as teamwork, communication, and time management, as many experiments require collaboration and coordination among peers (Hofstein & Lunetta, 2004). Additionally, it fosters curiosity and encourages students to pursue further studies in science-related fields, ultimately contributing to a more scientifically literate society.

2.2 Teachers' Role in Implementing Practical Examinations

Teachers are essential in ensuring the successful implementation of practical examination guidelines in secondary schools. Their experiences, preparedness, and perceptions directly affect the effectiveness of the practical examination process. Several studies, such as those by Mtitu (2014) and Kaale (2017), reveal that while teachers generally support the move towards more practical learning approaches, they often feel inadequately prepared to implement practical examinations. Factors such as a lack of ongoing professional development and training leave many teachers uncertain about handling the demands of practical examinations. Effective preparation for science practicals is time-consuming. Teachers need time to review practical examination instructions, source materials, set up equipment, test experiments for safety and functionality, and assess students during practical examinations. According to Osborne and Dillon (2010), teachers often

cite lack of preparation time as a significant barrier to delivering high-quality practical science lessons. In other words, when teachers are under time pressure, they are unable to plan effectively, leading to poorly organised practicals.

2.3 Teachers' Perception of Time Allocation for Science Practical

Several studies highlight that science teachers often feel they lack adequate time to fully prepare and implement practical lessons. According to research by Osborne and Dillon (2010), secondary school science teachers in various countries report that effective preparation for practical examinations requires at least several hours per week for lesson planning, sourcing materials, and setting up the laboratory. However, in many cases, particularly in low-resource environments, teachers are given significantly less time than they deem necessary. Science teachers in Tanzania, for instance, have expressed concerns that the time allocated for both practical lesson preparation and conducting examinations is insufficient. A study by Kafyulilo, Rugambuka, and Moses (2012) found that many Tanzanian teachers consider 5-10 hours per week necessary for the preparation of practicals, depending on the complexity of the experiments, the availability of resources, and the size of the class. In contrast, they are often allocated far less time due to congested school timetables and a lack of administrative support.

2.4 Challenges in Implementing Practical Examination Instructions

Implementing practical examination instructions comes with numerous challenges in Tanzanian secondary schools. One of the most pressing issues is the availability of resources. Studies, including those by Komba and Mwandaji (2018), report that schools often lack the necessary laboratory equipment, materials, and facilities required for effective practical sessions. However, implementing practical exams effectively depends on teachers' experiences and knowledge towards them. Science teachers face numerous challenges when preparing and organising these practical examinations. These challenges come from various issues, including limited resources, inadequate infrastructure, lack of professional development, and insufficient time. Many schools lack essential laboratory equipment and materials, making it difficult for teachers to conduct practicals (Mpapalika, 2014). Teachers, being the implementing agents, often confront a wide range of obstacles in effectively organising laboratory activities (Fitzgerald et al., 2017). Besides their teaching duties, science teachers are tasked with preparing equipment, solutions, and reagents for practical science

lessons, including materials and equipment procurements (Yalcin-Celik et al., 2017). In short, the strain on these teachers is likely magnified during times of curriculum reform when new topics and laboratory experiment requirements are introduced.

2.5 Teachers' Professional Development and Support Systems

Professional development and continuous training are essential for teachers to effectively implement practical examination instructions. Studies by Nyambo (2019) emphasise that the availability of structured, ongoing professional development programs for teachers is crucial for equipping them with the skills needed to manage practical examinations. However, some authors highlighted the obstacles to progress in the teaching and learning of practical work. Teachers often have insufficient knowledge of how to integrate practical work effectively into their teaching. They require more professional development and in-service training (Mkimbili & Kayima, 2020). Science practicals require a significant amount of time for preparation, execution, and assessment. However, the education system places heavy demands on teachers, with packed curricula and limited time allocated for subjects (Mwakalinga, 2020). In this sense, the pressure to cover theoretical content often leaves little time for practical sessions

Moreover, studies and curriculum frameworks (Mpapalika, 2014) reviewed under the current study have revealed that the curriculum does not provide adequate guidance on conducting practical exams, adding to the current challenge. Teachers often face challenges in conducting practical examinations due to insufficient backing from school administrations, which can result in limited access to necessary resources, equipment, and appropriate lab space. The effectiveness of science practicals largely depends on teachers' expertise, preparation, and the support they receive from the school administration. Kothari et al. (2017) say that without strong administrative support, the organisation and execution of practical exams become difficult, leading to issues like inadequate infrastructure and a lack of professional development for teachers to efficiently manage practical assessments (Patel, 2019).

2.6 Importance of Adequate Time for Preparation and Implementation in Science Education

Adequate time for preparation and implementation in science education is essential for ensuring effective learning outcomes, particularly for practical subjects like

science, where preparation often involves not only theoretical planning but also logistical setup of laboratory materials, safety measures, and coordination with students. Practical lessons and examinations offer students hands-on experiences that enhance understanding of scientific concepts, but they require significant planning. These activities necessitate careful preparation, including the setup of materials and safety precautions. However, for these practicals to be impactful, teachers need ample time to carefully plan and execute them. According to Woolnough (1994), science practicals are most effective when teachers have enough time to prepare, set up experiments, and instruct students in a step-by-step manner, allowing for better engagement and understanding. This involves selecting appropriate experiments, ensuring that the necessary equipment and materials are available and in good condition, and taking time to explain complex concepts clearly to students. Without adequate time, teachers may rush through experiments or skip important safety measures, which can lead to confusion, mistakes, and even accidents in the lab. Providing teachers with adequate time for preparation and implementation of practicals ensures high-quality science education and the safety of students in laboratories.

In this regard, NECTA science practical examination has not been studied in the context of changes in time for preparation and implementation of practical examination instructions in secondary schools, calling for the current investigative question: how do changes in allocated time for preparation and implementation of practical examination instructions affect science teachers' ability to effectively prepare science practicals in secondary schools?

The following research questions guided the study:

1. How are science teachers affected by changes in the allocated time for preparing and implementing practical examination instructions?
2. How much time do science teachers perceive as ideal for effectively preparing and implementing practical examination instructions?

2.7 Theoretical Framework

The current study was guided by the theory of supervision practice. According to this theory, supervision is a tool used to build the teaching profession's actual reality (Sergiovanni, 1982). Methods from the arts, sciences, and medicine are connected to Sergiovanni's notion of supervisory practice. According to Sergiovanni's (1982), the scientific approach is applied to determine the proper

teaching guidelines and the manner in which instructors and students should engage professionally during practicals. What instructors and students do in the classroom is determined by the creative practice, which includes policies or instructions in place.

The theory underpins the current study in terms of the need to foresee professional communication in the day-to-day teaching and learning supervisory practices. In reality, the collection of either animal or plant species becomes time-consuming and costly. Instructions given by the higher authorities as guidelines on how practicals should be conducted are translated into the practice through activities during classroom observation and the position of supervisors to record teaching and learning techniques as employed by teachers to their learners. The whole process needs enough time. It is against this background that the current study sought to understand these dynamics through teachers' readiness about the 3 hours of time for preparations against resource availability.

3. Methodology

3.1 Study context

The study included teachers from 10 Tanzanian public secondary schools (Mainland) from Dodoma City. The research permission was released by the United Republic of Tanzania, President's Office, Regional Administration, and the Local Government which helped the research team, with clearance from St John's University of Tanzania (SJUT) to get into the Regions and Districts. The schools were chosen based on the criteria of having appropriate resource support. The selection criterion was based on the premise that preparations of examination practical materials could be influenced by resource allocation and teachers' readiness and skills.

3.2 Research Design

A mixed-methods research methodology was employed in this study to collect data that was both quantitative and qualitative. Compared to using a single technique alone, the approach offers a deeper knowledge of the study phenomenon, the development of classroom rules and regulations, and their ramifications. The qualitative technique supplied a detailed and vocal account of people's experiences and opinions, whereas the quantitative approach assessed and reported participant responses in terms of percentages.

The shortcomings of one strategy are mitigated by another by combining strategies. This approach improves the calibre of results (Leech et al., 2010). Methodology, data

collection, and data analysis phases may all involve mixing processes (Cresswell, 2008). In this investigation, mixing occurred nearly throughout every stage. Simultaneous collection of qualitative and quantitative data was conducted. Data analysis was done independently even if data collection was done concurrently. However, both qualitative and quantitative data were included in the findings and their discussion. The study involved a total of 40 teachers, consisting of 16 females and 24 males, from 10 different schools in Dodoma City. A purposive sampling technique was employed, selecting participants based on their direct relevance to the research objectives.

Teachers were purposefully selected to consider only teachers with a background in science or science teachers. The right of teachers to voluntarily participate was examined in relation to ethical concerns. Teachers received information from data collecting instruments and permission forms verbally and in writing. To assure that every target responder had an equal opportunity to participate and that specific school schedules were not interrupted, the interviews and surveys were conducted outside of class time.

3.3 Data Collection Procedures

The present study was carried out in the period between 2024. The full data collection was preceded by a pilot study done out of selected schools. In the actual field, the data on how do changes in allocated time for preparation and implementation of practical examination instructions affect science teachers' ability to effectively prepare science practicals in secondary schools, were collected in a two-stage process using two different tools (interview schedule, and questionnaire).

Individual teachers were subjected to semi-structured interviews in order to obtain a comprehensive grasp of the phenomenon being studied. With the participants' permission, were made available through tape recorder. The time for interview and filling in the questionnaire was between 25mins and not more than 1hr.

3.4 Validity and reliability

But before then, content validity was applied to both interview and questionnaire questions through meticulous examination and piloting by professionals in the field of science education. Furthermore, in order to evaluate the internal reliability of the scale's component parts, the Cronbach's coefficient alpha for a four-point rating scale was computed using SPSS 25.0 (Cronbach & Shavelson, 2004). The items' adequate internal consistency was shown by the Cronbach's coefficient alpha of 0.8. According to Cronbach and Shavelson (2004), Cronbach's alpha values

should fall between 0 and 1, with 1 denoting excellent consistency.

3.5 Data Analysis

Quantitative and qualitative data collection was done independently. More specifically, the six stages recommended by Braun et al. (2017) were used to assess the qualitative data. The study team listened to the tape-recorded material several times in order to complete the transcribing process before beginning any meaningful analysis. Next, thoroughly reviewed the interview transcripts to become familiar with the data. The coding procedure was then carried out when this was finished. Coding was done to make interview data more manageable by making them less bulky (Cresswell, 2008). The hybrid codebook was created to direct the coding process and guarantee code uniformity. Line by line, phrase by phrase, sentence by sentence or paragraph by paragraph coding was carried out. After that, the codes were extracted and exported to an Excel file. Pivotal analysis was used in this Excel worksheet to create categories (themes) and calculate frequencies and percentages.

Several trends and categories were discovered as a consequence of the coding procedure. The research team was able to create tentative themes and subthemes as a result. The arising themes were periodically examined to assess their applicability and appropriateness. The topics were then given names and definitions. Put differently, every individual was given a unique name. After being retrieved from the questionnaire, the data were imported into Microsoft Excel 2016 and SPSS version 25.0 for further analysis. For every variable, descriptive statistics were calculated, including means, standard deviations, percentages, and frequencies.

4 Results and Discussion

This section begins by providing the demographic profile of the respondents. It provides the characteristics of the respondents in terms of gender, educational level, years in teaching field, current subject teaching by the respondents with a sequence of findings based on each research question.

4.1 Respondents demographic profile

Of the responses, 16 (40%) were female and 24 (60%) were male. This demonstrates unequivocally that the evidence supporting the conclusions came from both gender groups and was collected impartially. Again, 12 (30%) had a diploma and 28 (70%) had a degree. This could mean that science teachers who prepare the

practicals based on their students' educational levels provided the proof supporting the basic requirements. In addition, 16 (40%) of the respondents said they had taught

for 4–7 years, 14 (35%) for 8–10 years, and 10 (25%) for more than 10 years (Table 1).

Table 1: Respondents' education and gender profile

Gender	Freq.	%	Education level	Freq.	%	Teaching Experience	Freq.	%
Female	16	40	Diploma	12	30	4-7 years	16	40
Male	24	60	Degree	28	70	8-10 years	14	35
						Over 10 years	10	25
Total	40	100	Total	40	100	Total	40	100

4.2 Allocated time for preparing and implementing practical examination instructions

The study findings (Table 2) reveal that currently, exam secrecy is highly maintained, with enhanced supervision by the chief examiner during the preparation period, as pointed out with respondent 2: “*We are being supervised to the point that there is no one who can leave the area even if materials are scarce; the escort is all over the room.*”

(Teacher 2 from school 8, July, 2024). Contrary, evidence in Table 2, N=40, describes that a total of 16 (40%) of the respondents disagreed, 13 (33%) agreed, 8 (20%) were neutral, and 3 (7%) strongly disagreed that shortened time has a negative impact on their ability to prepare practical. In summary, even while exam confidentiality is strictly kept, there is no correlation between the amount of time allotted for preparation—three hours before the exam begins—and the teacher’s knowledge of subject matter or the ability to carry out practical tasks.

Table 2: Science teachers' attitudes about changes in the allocated time for preparing and implementing practical examination instructions

S/N	STATEMENT	S/D	D	N	A	S/A	T	S/D	D%	N%	A%	S/A	T%
								%				%	
1.	The shortened preparation time has negatively impacted my ability to prepare for practical examinations effectively.	3	16	8	13	-	40	7	40	20	33	-	100
2.	I have sufficient access to resources and materials needed for practical examination preparation within the revised time frame.	-	29	8	3	-	40	-	73	20	7	-	100
3.	I am interested in receiving additional training to enhance my efficiency in preparing practical examinations within tight timeframes.	-	-	-	21	19	40	-	-	-	53	47	100
4.	I find it challenging to get funds associated with materials for practical examinations	-	11	5	16	8	40	-	27	13	40	20	100
5.	Number of students participating in practical science examinations impacts the overall effectiveness of the preparing practical examinations.	5	16	8	10	1	40	13	40	20	25	2	100
6.	Schools should allocate sufficient budget and support for acquiring necessary resources and materials for practical science examinations.	-	-	-	13	27	40	-	-	-	33	67	100
7.	I have the opportunity to provide feedback on the time allocated for preparing and implementing practical examination instructions.	11	13	5	11	-	40	27	33	13	27	-	100

Based on the aforementioned findings above, Mohzana et al. (2023) discovered that the teacher's challenges stem from the material's incompatibility with time allocation, the orientation of cognitive aspects, the students' initial mental preparedness, and the teacher's ignorance of the nature of science. These encounters have an impact on instructors' comprehension of the guidelines given during practical preparations in their entirety. This may also suggest that instructors are not receiving enough help in the new timeframes to properly prepare practicals. Unfortunately, there is not a formal, transparent way for teachers to offer input on the most recent schedule modifications with significant disagreement between respondents 29 (73%, N=40, Table 2) favoring the insufficient access to resources and materials needed for practical exam preparation.

Findings revealed the need for school-based in-service professional development to improve teachers' feelings of competence in the teaching supervision. It is clear (Table 2) from the data that 100% of the respondents (n = 40) expressed interest in receiving training to increase their efficiency when preparing for the practical exam in the allotted period. This could imply that in order to develop qualified lab assistants in the future, specialised training or workshops are required with reference to the management of science laboratories in particular. In summary, science teachers are affected by changes in the allocated time for preparing and implementing practical examination instructions in terms of materials, readiness, and time allocation.

4.3 Time science teachers perceive as ideal for effectively preparing and implementing practical examination instructions

Findings reveal that the majority of respondents (93%, N = 40 in both 'agree' and 'strongly agree items', Table 3) were aware of the recent changes in time allocation for practical examination instructions by NECTA. This could mean success in ensuring teachers are well informed on the changes. However, 26 (65%, N = 40, Table 3) agree that

the allocated time for preparing practical science examinations is insufficient. This is added to another respondent point from school 4 that: "We do better revert to the old system, where these instructions came a day before, 24 hours." (Teacher 1 from school 4, July, 2024). In essence, there is a strong argument from teachers that is deepened into a combination of material availability, preparation time, and adaptability. This prompted a suggestion from one of them from school 1, saying, "A slight increase in time allocated would be beneficial to help them improve challenges in preparation and arrangement of practical examinations." (Teacher 2 from school 1, July, 2024).

Table 3: Science teachers time recommendations for effectively preparing and implementing practical examination instructions

S/N	STATEMENT	S/D	D	N	A	S/A	T	S/D%	D%	N%	A%	S/A%	T%
1.	I am aware of the recent changes in time allocation for practical examination instructions by NECTA in preparing and arrangement of practical exams.	-	3	-	13	24	40	-	7	-	33	60	100
2.	The allocated time for preparing practical science exams is insufficient.	5	4	2	26	3	40	13	10	5	65	7	100
3.	I am satisfied with the current allocated time for preparing science practical examinations	13	13	5	5	4	40	32	32	13	13	10	100
4.	My school has provided adequate support to assist me in adapting to the new time allocation for practical examination preparation.	8	3	8	21	-	40	20	7	20	53	-	100
5.	A slight increase in time allocated for preparing practical science exams would be beneficial.	5	8	3	21	3	40	13	20	7	53	7	100

Moreover, according to Sergiovanni's (1982) theoretical viewpoints employed in this study, what instructors and students perform in the classroom is determined by creative practice, which involves set standards or guidelines. Put otherwise, the impact of the three-hour regulation dictates how well students and instructors do. It might prompt further research into whether this has something to do with academic performance. Furthermore, one respondent from School 10 could imagine:

"...how can the collection of the following exemplary plant and animal species be prepared in 3 hours?" -frog, cockroaches, moss plant, hibiscus

flowers, tilapia and what about food test experiments? You see, this is difficult, especially when one species misses; then you may need to travel to the nearby school or market to buy it. (Teacher 2 from school 10, July, 2024).

Generally, teachers voice, as practitioners, points towards the deflection of immediate changes for effective execution of practical.

5. Conclusion and Recommendations

5.1 Conclusion

The study concludes that significant improvements have been made in the management and security of examinations compared to previous years. Currently, exam secrecy is highly maintained, with enhanced supervision by the chief examiner during the preparation period and increased security measures in the laboratory. Despite these advancements, science teachers have expressed concerns regarding the changes in the allocated time for preparing and organising practical examinations. While they are aware of these revisions, they find the new timeframe insufficient, which is crucial for laboratory management. Again, the execution of the practicals is also impacted by insufficient preparation time; when there are too many students and not enough equipment and resources, the practical will take a long time to complete. However, it is still not clear what strategies science teachers employ to cope with time constraints in preparing and conducting practical examinations and whether this could have an impact on students' academic achievement; this remains an uptake for further research.

Moreover, teachers and schools have not been given the opportunity to provide feedback or suggestions regarding the practical exams, particularly concerning the three-hour preparation and laboratory setup period. This lack of consultation is a notable concern. Additionally, the study highlights the financial burden imposed on schools due to the practical exams. The increased number of required equipment items, many of which may not be utilised, forces schools to incur extra costs, often leading to financial strain. Furthermore, teachers have shown a strong interest in receiving additional training to improve their efficiency in preparing practical examinations within the limited time available. This reflects their commitment to maintaining the quality of education despite the challenges posed by the current examination procedures.

5.2 Recommendations

Based on the research findings, the study puts forward several recommendations aimed at improving the administration and execution of practical examinations.

1. First, it is recommended that NECTA revise and reduce the list of required equipment and specimens, taking into consideration the financial constraints of schools. This adjustment would help alleviate the increased budgetary pressure that many schools are currently facing.
2. Given that some schools utilise classrooms rather than dedicated laboratories for exam preparation,

NECTA should conduct thorough inspections of the facilities where practical exams will be held to ensure they are suitable and adequately equipped. Furthermore, a formal mechanism should be established to allow teachers and schools to provide feedback and suggestions, particularly concerning the three-hour preparation and laboratory arrangement period, which many find insufficient.

3. It is also recommended that NECTA extend the allotted time for preparation and laboratory arrangements during national practical examinations, providing teachers with the necessary time to set up effectively. Regular seminars and training sessions should be continued and expanded for science teachers to enhance their skills and proficiency in preparing for these exams under new timeframes. Lastly, the Ministry of Education is urged to allocate specific funding for the preparation of national practical exams to ensure that schools have the necessary resources to meet the examination requirements without financial strain.

References

- Braun, V., Clarke, V., Braun, V., & Clarke, V. (2017). Applied qualitative research in psychology. *Applied Qualitative Research in Psychology*, 0887(2006). <https://doi.org/10.1057/978-1-137-35913-1>
- Cresswell, T. (2008). Geographic thought. In *geographic Thought*. <https://doi.org/10.4324/9780203893074>
- Cronbach, L. J., & Shavelson, R. J. (2004). My current thoughts on coefficient alpha and successor procedures. *Educational and Psychological Measurement*, 64(3), 391–418. <https://doi.org/10.1177/0013164404266386>
- Fitzgerald, M., Danaia, L. & McKinnon, D. H. (2017). *Barriers inhibiting inquiry-based science teaching and potential solutions: Perceptions of positively inclined early adopters*. Research in Science Education.
- Hofstein, A., & Lunetta, V. N. (2004). *The laboratory in science education: Foundations for the twenty-first century*. *Science Education*, 88(1), 28-54.
- Kaale, E. (2017). *Teachers' Perceptions of the Implementation of Competency-Based Curriculum in Tanzanian Secondary Schools*. *Journal of Education and Practice*, 8(12), 33-42.

- Kafyulilo, A., Rugambuka, I. B., & Moses, I. (2012). *Teachers' perceptions on the use of ICT in implementing competence-based curriculum in Tanzania. Journal of Education and Development*, 2(1), 1-17.
- Komba, C. & Mwandanji, M. (2018). *Challenges of Teaching Practical Subjects in Tanzanian*
- Kothari, D. S., & Sharma, R. K. (2017). *Challenges in Practical Science Education. International Journal of Educational Research*, 65, 103-110.
- Leech, N. L., Dellinger, A. B., Brannagan, K. B., & Tanaka, H. (2010). Evaluating mixed research studies: A mixed methods approach. *Journal of Mixed Methods Research*, 4(1), 17–31. <https://doi.org/10.1177/1558689809345262>
- Mkimbili, S. T., & Kayima, L. (2020). *Challenges faced by Tanzanian science teachers in practical assessments. African Journal of Education Studies*, 12(2), 45-60.
- Mohzana, M., Murcahyanto, H., Fahrurrozi, Muh., & Supriadi, Y. N. (2023). Optimization of Management of Laboratory Facilities in the Process of Learning Science at High School. *Jurnal Penelitian Pendidikan IPA*, 9(10), 8226–8234. <https://doi.org/10.29303/jppipa.v9i10.5249>
- Mpapalika, K. M. (2014). *Tanzania Science Teachers' Practices and Challenges in Continuous Assessment*. University of Witwatersrand.
- Mtitu, E. A. (2014). *Learner-Centered Teaching in Tanzania: Geography Teachers' Perceptions and Experiences. International Journal of Education and Development using ICT*, 10(1), 55-69.
- Mwakalinga, E. J. (2020). *Time management issues in Tanzanian secondary schools during science practical preparations. Journal of Educational Research*, 8(3), 121-135.
- National Research Council. (2000). *How People Learn: Brain, Mind, Experience, and School (expanded edition)*. Washington, DC: National Academy Press.
- NECTA, (2019); *Certificate of Secondary Education Examination formats*, Dar es salaam- Tanzania.
- NECTA, (2022); *Certificate of Secondary Education Examination formats*, Dar es salaam-Tanzania.
- Nyambo, M. (2019). *Professional Development of Secondary School Teachers in Tanzania: A Case of In-service Training. African Educational Research Journal*, 7(2), 101-110.
- Osborne, J., & Dillon, J. (2010). *Good Practice in Science Teaching: What Research Has to Say*. Open University Press.
- Patel, A. P. (2019). *Institutional Support and Its Impact on Practical Examinations. Journal of Educational Assessment and Policy Studies*, 8(3), 45-59.
- Sergiovanni, T. (1982). *Supervision of Teaching*. ERIC.
- URT, (2014); *Tanzania Education and Training policy*, Dar es salaam- Tanzania.
- Woolnough, B. (1994). *Effective Science Teaching*. Open University Press.
- Yalcin-Celik, A.; Kadayifci, H.; Uner, S.; Turan-Oluk, N. (2017). Challenges faced by pre-service chemistry teachers teaching in a laboratory and their solution proposals, *European Journal of Teacher Education*, 40, 210–230.